

# **NATIONAL GRID COMPANY OF PAKISTAN (NGC)**



## **BIDDING DOCUMENT NO. TLE-02-2026 (EPC WORKS)**

**FOR DESIGN, MANUFACTURE, PROCUREMENT, SUPPLY,  
INSTALLATION, TESTING & COMMISSIONING OF 500 KV  
TRANSMISSION LINES FOR PHASE-1 OF C-5 POWER  
EVACUATION SCHEME**

- LOT-I:** 500 kV D/C Ludewala–Faisalabad West —Section A (Approx. 51 km)
- LOT-II:** 500 kV D/C Ludewala–Faisalabad West —Section B (Approx. 49 km)
- LOT-III:** 500 kV D/C C-5–Ludewala — Section A (Approx. 30 km),
- LOT-IV:** 500 kV D/C C-5–Ludewala — Section B (Approx. 32 km),
- LOT-V:** 500 kV D/C C-5–Ludewala — Section C (Approx. 29 km),
- LOT-VI:** 500 kV D/C C-5–Ludewala — Section D (Approx. 32 km),
- LOT-VII:** 500kV S/C C5-Ludewala – Section A (Approx. 30 km),
- LOT-VIII:** 500kV S/C C5-Ludewala – Section B (Approx. 32 km),
- LOT-IX:** 500kV S/C C5-Ludewala – Section C (Approx. 29 km), &
- LOT-X:** 500kV S/C C5-Ludewala – Section D (Approx. 32 km).

### **UNDER NGC'S OWN RESOURCES SINGLE STAGE TWO ENVELOPE**

#### **VOLUME-1 (Commercial & Technical Conditions)**

**TRANSMISSION ENGINEERING DEPARTMENT, NGC  
AUGUST, 2026**

## **Bidding Document No. TLE-02-2026**

This bidding document comprises of 3 Volumes:

1) Volume-I: (1 Books)

Commercial & Technical Conditions

2) Volume-II: (1 Book)

Technical Provisions & Specifications

3) Volume-III: (1 Book)

Drawings & Route

## SUMMARY OF CONTENTS

| <b><u>DESCRIPTION</u></b>                                  | <b><u>PAGE NO</u></b> |
|------------------------------------------------------------|-----------------------|
| (I) INSTRUCTIONS TO BIDDERS.....                           | ITB1-IB60             |
| (II) FORM OF TECHNICAL BID & SCHEDULES TO BID.....         | TBS1-TBS83            |
| (III) FORM OF PRICE BID & SCHEDULES TO BID .....           | PBS 1-PBS387          |
| (IV) PREAMBLE TO CONDITIONS OF CONTRACT .....              | PTC 1-PTC 4           |
| (V) GENERAL CONDITIONS OF CONTRACT .....                   | GCC1-GCC55            |
| (VI) PARTICULAR CONDITIONS OF CONTRACT .....               | PCC1-PCC70            |
| (VII) STANDARD FORMS.....                                  | SF1-SF8               |
| (VIII) SPECIFICATIONS - SPECIAL PROVISIONS .....           | SP1-SP15              |
| (IX) VOLUME-II: SPECIFICATIONS - TECHNICAL PROVISIONS      |                       |
| (X) VOLUME-III: SPECIFICATIONS & DRAWINGS (ENCLOSED IN CD) |                       |

# **INVITATION FOR BIDS**

## INVITATION FOR BIDS

**Date:** **09.09.2026**

**Bid Reference No.:** **TLE-02-2026**

1. The National Grid Company of Pakistan of Pakistan (NGC) “the Employer” intends to hire the services of EPC contractors through International Competitive Bidding (ICB) from eligible firms as defined under IB-2 of Instruction to Bidders of the bidding documents. The tender is to be financed under NGC’s own resources. The Scope of Services is:

Design, Manufacture, Procurement, Supply, Installation, Testing & Commissioning of 500 kV Transmission Lines for Phase-1 of C-5 Power Evacuation Scheme

- LOT-I:** 500 kV D/C Ludewala–Faisalabad West-Section A (Approx. 51 km)  
**LOT-II:** 500 kV D/C Ludewala–Faisalabad West-Section B (Approx. 49 m)  
**LOT-III:** 500 kV D/C C-5–Ludewala — Section A (Approx. 30 km),  
**LOT-IV:** 500 kV D/C C-5–Ludewala — Section B (Approx. 32 km),  
**LOT-V:** 500 kV D/C C-5–Ludewala — Section C (Approx. 29 km),  
**LOT-VI:** 500 kV D/C C-5–Ludewala — Section D (Approx. 32 km),  
**LOT-VII:** 500kV S/C C5-Ludewala – Section A (Approx. 30 km),  
**LOT-VIII:** 500kV S/C C5-Ludewala – Section B (Approx. 32 km),  
**LOT-IX:** 500kV S/C C5-Ludewala – Section C (Approx. 29 km), &  
**LOT-X:** 500kV S/C C5-Ludewala – Section D (Approx. 32 km).

2. The Employer invites sealed bids from eligible firms for the above scope of Works. International Competitive Bidding (ICB) will be conducted in accordance with PEC Single Stage Two Envelope procedure (Technical and Price bids in two separate envelopes).
3. Eligible Bidders may obtain further information from the Office of the Employer, as below:

Director General (Procurement) NGC,  
8<sup>th</sup> Floor, Shaheen Complex,  
Egerton Road, Lahore-Pakistan  
Telephone No. 92-42-99202597  
Fax No. 92-42-99202173  
E-mail address: [dg.procurement@ngc.gov.pk](mailto:dg.procurement@ngc.gov.pk)

5. All bids must be accompanied by a Bid Security in the amount not less than PKR 162 Million (for Lot-I), PKR 181 Million (for Lot-II), PKR 89 Million (for Lot-III), PKR 100 Million (for Lot-IV), PKR 107 Million (for Lot-V), PKR 119 Million (for Lot-VI), PKR 56 Million (for Lot-VII), PKR 62 Million (for Lot-VIII), PKR 68 Million (for Lot-IX) and PKR 67 Million (for Lot-X) or an equivalent amount in a freely convertible currency in the format of bank guarantee on bid security form provided or in the form of deposit at call in favor of Employer.

6. The bidder must satisfy the evaluation and qualification criteria in Section 3 of the Bidding Document, including the following key requirements:

- (i) The bidder (as main contractor, Management contractor or JV / Consortium partner) shall have executed **One (1) 500kV or higher voltage bundled transmission line or three (3) 220kV bundled transmission line** project(s) of length equaling to at least **25.5 km (for Lot-I), 24.5 km (for Lot-II), 15 km (for Lot-III), 16 km (for Lot-IV), 14.5 km (for Lot-V), 16 km (for Lot-VI), 15 km (for Lot-VII), 16 km (for Lot-VIII), 14.5 km (for Lot-IX), and 16 km (for Lot-X)** (on cumulative basis) **in past ten (10) years** which have been in operation for at least **last two (2) years** as of bid opening date. The executed work shall include detail survey, sub-soil investigations, construction, construction of towers conventional foundations, erection of tower, stringing, testing and commissioning of the line.

Note-I: In case of specialized work like pile foundations or through hilly terrain or river crossing, the bidder may propose subcontractor having similar experience of 5 years if requirement not met by the bidder.

Note-II: If the contractor has not executed any EPC project in the past as sole entity, they have to propose an engineering firm/ sub-contractor meeting with the following criteria:

“The engineering firm/sub-contractor shall have designed (electrical and civil) at least one Line / Substation project in last five (05) years of same or higher voltage level and same nature which shall be in services for last (02) two years as of bid opening date.”

In case of JV, Lead partner shall exhibit the above-mentioned criteria while other partner(s) shall have to exhibit the following criteria:

- (ii) In case of JV, the partners other than the lead partner, shall have executed (as main contractor, Management contractor or JV / Consortium partner) **One (1) 500 kV or higher voltage bundled transmission line or three (3) 220 kV bundled transmission line** project(s) of length equaling to at least **12.75 km (for Lot-I), 12.25 km (for Lot-II), 7.5 km (for Lot-III), 8 km (for Lot-IV), 7.25 km (for Lot-V), 8 km (for Lot-VI), 7.5 km (for Lot-VII), 8 km (for Lot-VIII), 7.25 km (for Lot-IX), and 8 km (for Lot-X)** (on cumulative basis) **in past ten (10) years** which have been in operation for at least **last two (2) years** as of bid opening date. The executed work shall include detail survey, sub-soil investigations, construction, construction of towers conventional foundations, erection of tower, stringing, testing and commissioning of the line.

***For the complete eligibility and qualification requirements, Bidders should refer to the Bidding Documents.***

7. The bidders must quote for the complete scope of work. Bids covering only a part of the work shall be rejected.

8. A Pre-Bid meeting will take place on the date, time and place as follows:
- Date: **16-09-2026**  
Time: **11:00am** (Pakistan Standard Time)  
Place: 8<sup>th</sup> Floor, Shaheen Complex, Egerton Road, Lahore.
9. NGC reserve all its rights regarding rejection of bids as defined in Clause 33(1) of PPRA Rules 2004.
10. Complete bid must be submitted through e-PADS only on or before **05-10-2026, 11:00am (Pakistan Standard Time)**. However, Bid Security is required to be submitted in Original (hard copy) before bids closing deadline. Technical Bids will be opened on the same day at **11:30am (Pakistan Standard Time)**, in the presence of Bidder's representatives who choose to attend at the same address.
11. The bids must be received by the Employer through e-PADS only before the bid submission deadline.

**Director General (Procurement) NGC**  
Fax No. 92-42-99202173  
E-Mail: [dg.procurement@ngc.gov.pk](mailto:dg.procurement@ngc.gov.pk)

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# **INSTRUCTIONS TO BIDDERS**



## INSTRUCTIONS TO BIDDERS

### A. GENERAL

#### IB.1 Scope of Bid and Source of Funds

##### 1.1 Scope of Bid

**National Grid Company of Pakistan (NGC)**, (hereinafter called “the Employer”) issues this Bidding Document for procurement of the following Works through International Competitive Bidding (ICB):

The name of the Project is:

Design, Manufacture, Procurement, Supply, Installation, Testing & Commissioning of 500 kV Transmission Lines for Phase-1 of C-5 Power Evacuation Scheme:

- LOT-I:** 500 kV D/C Ludewala–Faisalabad West-Section A (Approx. 51 km)
- LOT-II:** 500 kV D/C Ludewala–Faisalabad West-Section B (Approx. 49 m)
- LOT-III:** 500 kV D/C C-5–Ludewala — Section A (Approx. 30 km),
- LOT-IV:** 500 kV D/C C-5–Ludewala — Section B (Approx. 32 km),
- LOT-V:** 500 kV D/C C-5–Ludewala — Section C (Approx. 29 km),
- LOT-VI:** 500 kV D/C C-5–Ludewala — Section D (Approx. 32 km),
- LOT-VII:** 500kV S/C C5-Ludewala – Section A (Approx. 30 km),
- LOT-VIII:** 500kV S/C C5-Ludewala – Section B (Approx. 32 km),
- LOT-IX:** 500kV S/C C5-Ludewala – Section C (Approx. 29 km), &
- LOT-X:** 500kV S/C C5-Ludewala – Section D (Approx. 32 km).

Scope of work includes the construction of 500 kV overhead transmission lines for Phase-1 of C-5 Power Evacuation Scheme on EPC basis. Tentative routes, alongwith Plan & Profile for the above-mentioned double circuit transmission lines have been worked out and included in Volume-III of the tender documents for bidding purpose. The routes for Single Circuit lines (as in Lot-VII, VIII, IX & X) are expected to fall in the vicinity of and parallel to the corresponding Double Circuit lines. The finalized routes shall be provided to the successful bidder(s) after the award of contract(s). The project will be executed on EPC basis i.e., the contractor will be responsible for Design, Manufacturing, Supply and Installation of all equipment.

Bidders must quote for the complete scope of work for the respective Lot. Any bid covering partial scope of work will be rejected as non-responsive, pursuant to Clause IB.24.

##### 1.2 Source of Funds

The Employer will make eligible payments under the Contract for which these Bidding Documents are issued, from his own resources.

##### 1.3 Throughout this Bidding Document

- (a) the term “in writing” means communicated in written form and delivered against receipt;
- (b) except where the context requires otherwise, words indicating the singular also include the plural and words indicating the plural also include the singular; and
- (c) “day” means calendar day.

## **IB.2 Eligible Bidders**

2.1 The Invitation for Bids is open to all bidders meeting the following requirements:

- i. A bidder may be a natural person, private entity, or government-owned enterprise or any combination of them with a formal intent to enter into an agreement or under an existing agreement in the form of a Joint Venture (in which case all partners shall be jointly and severally liable). Subject to sub clause IB 2.1 (iii), the Bidder shall be duly licensed by the Pakistan Engineering Council (PEC) minimum in the appropriate category relevant to the value of the Works or had applied for renewal of license before submission of its bid. In case of Joint Venture, all the partners shall be duly licensed by PEC.
- ii. A bidder not having nationality of Pakistan shall have nationality of an eligible country as per Appendix ‘A’ to instruction to bidders. A bidder shall be deemed to have the nationality of a country if the Bidder is a citizen or is constituted, incorporated, or registered, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services.
- iii. Foreign firms shall not be eligible to participate in bidding individually. Foreign firms shall enter into joint venture with Pakistani firm registered with the Pakistan Engineering Council in equivalent/compatible category and submit the same to the employer before participating in bidding. A foreign bidder, in case of award shall get registration from PEC.
- iv. Pakistani bidders shall be on Active Taxpayers List (both Income Tax and Sales Tax) of the Federal Board of Revenue and relevant Provincial Revenue Authority. Foreign bidders will get themselves registered from relevant tax authorities after award of contract, as required under law of Pakistan.
- v. The Bidder shall not be blacklisted by NGC/ WAPDA/DISCOs/any Government/Public department/Donor Agencies at the time of submission of bids. The Bidder should provide details of previous black listing, if any. An affidavit is to be provided by the Bidder that the Bidder is not black listed by NGC/WAPDA/DISCOs/any Government/Public department/Donor Agencies at the time of submission of bids. Further, the bidder shall submit an Undertaking along with his bid that he has read and accepts the provisions of

NGC policy (attached with the bidding document as Annexure-A) for blacklisting of Contractors. Non-submission of this undertaking may result in the rejection of the bid. The said undertaking will subsequently become part of Contract Agreement as well.

- vi. The bidder shall submit an unconditional “Comfort Letter” alongwith their bid as per Appendix-D to Bidding Data from a schedule bank (the Bank) in Pakistan extend banking facilities to the bidder including but not limited to opening of Letter of Credit, making payment through direct disbursement procedure, retirement of the shipping documents, issuance of electronic import form (EIF) for custom clearance purposes, in case of award of Contract.

NGC however, shall bear no risk in case of non-commitment by the Bank after award of contract. Further, it shall not be binding upon NGC to avail banking facility from the particular Bank.

- vii. The bidder shall submit dully filled/complete Beneficial Ownership Declaration Performa as per S.R.O 592(I)/2022 available at <https://www.ppra.org.pk/doc/sro592.pdf>
- viii. Firms shall be excluded if by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, Pakistan prohibits any import of goods or contracting of works or services from that country or any payments to persons or entities in that country.

### **IB.3 Eligible Goods and Services**

- 3.1 All Goods and ancillary Services to be supplied under this Contract shall have their origin in eligible countries listed in Appendix ‘A’ to Instructions to Bidders and all expenditures made under the Contract will be limited to such Goods and Services.
- 3.2 For purpose of this Clause, “origin” means the place where the Goods or component parts thereof are mined, grown or produced or from where the ancillary services are supplied. Goods are produced when, through manufacturing, processing or substantial and major assembling of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components.
- 3.3 The origin of Goods and Services is distinct from the nationality of the Bidder.

### **IB.4 Cost of Bidding**

- 4.1 The bidder shall bear all costs associated with the preparation and submission of its bid and the Employer will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

## **B. BIDDING DOCUMENTS**

### **IB.5 Contents of Bidding Documents**

5.1 In addition to Invitation for Bids, the Bidding Documents are those stated below, and should be read in conjunction with any amendment or addenda issued in accordance with Clause IB.7.

1. Instructions to Bidders (ITB) with Appendices to ITB as follows:
  - (i) Appendix A to ITB: Name of Eligible Countries
  - (ii) Appendix B to ITB: Evidence of Bidder's & Subcontractor's capability
    - (a) Form ELI-1: Bidder's Information Sheet
    - (b) Form ELI-2: Joint Venture Information Sheet
    - (c) Form FIN-1: Historical Financial Performance
    - (d) Form FIN-2: Average Annual Turnover
    - (e) Form FIN-3: Availability of Financial Resources
    - (f) Form FIN-4: Financial Requirements of Current Contract Commitments
    - (g) Form EXP-1: Contracts of Similar Size and Nature
    - (h) Form EXP-2: Experience in Key Activities
    - (i) Form EXP-3: Experience of Subcontractors/Manufacturers
  - (iii) Appendix C to ITB: Domestic Goods
  - (iv) Appendix D to ITB: Comfort Letter
  - (v) Appendix E to ITB: Form of Bid Security
2. Letter of Technical Bid & Schedules to Bid as follows:
  - (i) Schedule A: Specific Plant Data (Schedule of Technical Data)
  - (ii) Schedule B: Proposed Organization for the Project & Work Methodology
    - (a) Form 1: Site Organization & Method Statement
    - (b) Form 2: Mobilization Schedule
  - (iii) Schedule C: Construction Schedule
  - (iv) Schedule D: Personnel
    - (a) Form PER-1: Proposed Personnel
    - (b) Form PER-2: Resume of proposed Personnel
  - (v) Schedule E: Subcontractors  
Form SUBCON: Proposed Subcontractors/ Manufacturers for Major Items of Plant and Services
  - (vi) Schedule F: Country of Origin Declaration Form
  - (vii) Schedule G: Deviations from Technical & Contractual Provisions
  - (viii) Schedule H: Specimen JV Agreement (if applicable)

- (ix) Schedule I: Equipment
  - (x) Schedule K: An Undertaking that the Bidder has read and accepts NGC's SOP for Blacklisting of Contractors pursuant to Sub-Clause 2.1(v)
  - (xi) Schedule L: Manufacturer's Authorization
  - (xii) Schedule M: Undertaking for Type Test of Equipment
3. Letter of Price Bid & Schedules to Bid  
Schedules to Bid are the following:
- (i) Schedule J: Integrity Pact
4. Schedule of Prices
5. Preamble to Conditions of Contract
6. General Conditions of Contract (GCC)
7. Particular Conditions of Contract (PCC)
8. Standard Forms  
Forms include the following:
- (i) Form of Contract Agreement
  - (ii) Form of Performance Security
  - (iii) Form of Bank Guarantee for Advance Payment
  - (iv) Indemnity Bond for Secured Advance
9. Specifications - Special & Technical Provisions
10. Technical Provisions - Specifications (Volume-II)
11. Drawings (Volume-III)

- 5.2 The complete Bidding Document including Addenda (if any) will be available on Employer's website i.e. [www.ntdc.com.pk](http://www.ntdc.com.pk) and on e-PADS.

The Bidders are responsible for the completeness of the Bidding Document in all respects. The Employer accepts no responsibility for any Bidder lacking a complete set of Bidding Documents including Addenda (if any).

## **IB.6 Clarification of Bidding Documents**

- 6.1 No request for clarification will be entertained which will be received later than 14 days prior to the date fixed for submission of Bids. The Purchaser's response will be made not later than 7 days prior to the date fixed for submission of Bids. Moreover, the bidders may also submit their request for clarification through ePADS.

Further, the mere request for clarification from the bidders shall not be a ground for seeking extension in the deadline for submission of Bids.

The Employer's response to the pre-bid clarifications will be communicated via publishing on NGC's website and on e-PADS.

## **IB.7 Amendment of Bidding Documents**

- 7.1 At any time prior to the deadline for submission of bids, the Employer may, for any reason, whether at his own initiative or in response to a clarification requested by a prospective bidder, modify the Bidding Documents by issuing addendum.
- 7.2 Any addendum thus issued shall be part of the Bidding Documents pursuant to IB 7.1 hereof and shall be communicated via publishing on NGC's website and on e-PADS.
- 7.3 To afford prospective bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer may at its discretion extend the deadline for submission of bids in accordance with Clause IB.19.

### C. PREPARATION OF BIDS

#### IB.8 Language of Bid

- 8.1 The Bid prepared by the Bidder and all correspondence and documents relating to the Bid, exchanged by the Bidder and the Employer shall be written in the **English language**, provided that any printed literature furnished by the Bidder may be written in another language so long as accompanied by an English translation of its pertinent passages in which case, for purposes of interpretation of the Bid, the English translation shall govern.

#### IB.9 Documents Comprising the Bid

- 9.1 The Bidder shall submit the bid through e-PADS only in 2 separate pdf files for each lot, one to be referred as "Technical Bid" and the other to be referred as "Price Bid" comprising the following documents in the respective pdf files, **however, Bid Security is required to be submitted in original before bids submission deadline:**

##### **I. Technical Bid (To be submitted in separate pdf file for each quoted lot)**

- (a) Covering Letter for Technical Bid
- (b) Letter of Technical Bid duly filled, signed and sealed, in accordance with Clause IB.17.
- (c) Bid Security furnished in accordance with clause IB 15 on prescribed format (Appendix-E to ITB)
- (d) Power of Attorney, duly notarized, authorizing the signatory of the bid to act for and on behalf of the Bidder in accordance with Clause IB 17.4
- (e) Documentary evidence established in accordance with Clause IB.14 that the Plant and ancillary Services to be supplied by the Bidder are eligible

Plant and Services and conform to the Bidding Documents.

- (f) Documentary evidence in accordance with Clause IB.13, the Bidder's eligibility and qualifications to perform the Contract if its Bid is accepted.
- (g) Technical Proposal in accordance with clause IB 14A.
- (h) in the case of a bid submitted by a Joint Venture, the Bid shall include a copy of the Joint Venture Agreement entered into by all partners. Alternatively, a Letter of Intent to execute a Joint Venture Agreement in the event of a successful bid shall be signed by all partners and submitted with the Bid, together with a copy of the proposed agreement. A foreign Bidder is entitled to bid only in a joint venture with a Pakistani constructor in accordance with the provisions of relevant PEC bye-laws.
- (i) An affidavit that the Bidder (or any partner in case of joint venture) has not been black listed pursuant to Sub-Clause 2.1(v) (Schedule K to Bid);
- (j) An Undertaking for Type Test of Equipment pursuant to Sub-Clause 14.3(e) (Schedule M to Bid)
- (k) List of Proposed Subcontractors/Manufacturers for Major Items of Plant and Services (Form SUBCON of Schedule E to Bid)
- (l) Letter of Comfort (Appendix-D to ITB)
- (m) Beneficial Ownership Declaration Performa pursuant to sub-Clause 2.1 (vii)
- (n) PEC license pursuant to Sub-Clause 2.1; and
- (o) Any other documents prescribed in Particular Conditions of Contract or Technical Provisions to be submitted with the Bid.

## II. Price Bid

- (a) Covering Letter for Price Bid
- (b) Letter of Price Bid duly filled, signed and sealed, in accordance with Clause IB.17.
- (c) **Schedule of Prices** completed in accordance with Clauses IB.11 and IB.12 in separate pdf file. The forms must be completed without any alterations to the text, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested. The units and rates in figures entered into the Price Schedules should be typewritten or if written by hand, must be in print form. Price Schedules not presented accordingly may be considered nonresponsive.
- (d) Schedule J to Bid, duly filled and signed, in accordance with the instructions contained therein.
- (e) Appendix C to ITB, duly filled and signed, in accordance with the instructions contained therein, if applicable.

Bidders applying for eligibility for domestic preference in bid evaluation shall supply all information & evidence to establish the claim for domestic preference required to satisfy the criteria for eligibility as described in Clause IB.27. The particulars for domestic Goods prescribed in Appendix C to these Instructions shall also be filled in to substantiate claim for domestic preference.

- (f) Any other documents prescribed in Particular Conditions of Contract or Technical Provisions to be submitted with the Bid.

#### **IB.10 Letters of Bids and Schedules**

- 10.1 The Bidder shall complete, sign and seal the Letters of Bids, Schedules (A to L, or as modified) to Bid, Appendices to ITB and Schedule of Prices furnished in the Bidding Documents and shall also enclose other information as detailed in Clause IB.9.
- 10.2 For the purpose of granting a margin of domestic preference pursuant to Clause IB.27, the Employer will classify the Bids, when submitted in one of three groups as follows subject to change, if any, as per policy of the Federal Government as applicable on the date of bid opening:
  - (a) **Group 'A' Bid.** (i) For Goods for which labour, raw materials and components from within Pakistan account for at least 20% of the ex-factory bid price of the products offered (ii) For Goods for which labour, raw materials and components from within Pakistan account for over 20% and up to 30% of the ex-factory bid price of the products offered (iii) For Goods for which labour, raw materials and components from within Pakistan account for over 30% of the ex-factory bid price of the products offered;
  - (b) **Group 'B' Bid.** For Goods manufactured in Pakistan for which the domestic value added in the manufacturing cost is less than 20% of the ex-factory bid price; and
  - (c) **Group 'C' Bid.** For Goods of foreign origin.  
In preparing their bids, the Bidders, whether local or foreign, shall enter in the Schedule of Prices, ex-factory price for indigenously manufactured products and CIP price as well as customs duty and sales tax and other import charges for products to be imported from outside Pakistan.

The value addition will be established by the Certificate issued by Engineering Development Board (EDB) Pakistan for this purpose.

#### **IB.11 Bid Prices**

- 11.1 The bidder shall fill up the Schedule of Prices attached to these documents



indicating the unit rates and prices of the Works to be performed under the Contract. Prices on the Schedule of Prices shall be entered keeping in view the instructions contained in the Preamble to the Schedule of Prices. The units and rates in figures entered into Schedules of Prices shall be typewritten, or if written by hand, shall be in print form. Bidder shall quote for the entire Works on a "single responsibility" basis such that the total Bid price covers all the Contractor's commercial, contractual and technical obligations mentioned in or to be reasonably inferred from the Bidding Document in respect of the design, manufacture, including procurement and subcontracting (if any), delivery, construction, installation, and completion of the Works. This includes all requirements under the Contractor's responsibilities for testing, pre-commissioning and commissioning of the Works and, where so required by the Bidding Document, the acquisition of all permits, approvals, and licenses, etc.; the operation, maintenance, and training services and such other items and services as may be specified in the Bidding Document, all in accordance with the requirements of the General Conditions and Particular Conditions of Contract.

- 11.2 Bidders shall give a breakdown of the prices in the following manner: Separate numbered Schedules of Prices shall be used for each of the following elements. The total amount from each Schedule (Nos. 1 to 4) shall be summarized in a Grand Summary (Schedule No. 5) giving the total bid price(s) to be entered in the Letter of Price Bid. Absence of the total bid price in the Letter of Price Bid may result in the rejection of the Bid.

|                 |                                                                             |
|-----------------|-----------------------------------------------------------------------------|
| Schedule No. 1: | Plant and Mandatory Spare Parts Supplied from Abroad                        |
| Schedule No. 2: | Plant and Mandatory Spare Parts Supplied from Within the Employer's Country |
| Schedule No. 3: | Design Services                                                             |
| Schedule No. 4: | Installation and Other Services                                             |
| Schedule No. 5  | Grand Summary (Schedule Nos. 1 to 4)                                        |
| Schedule No. 6: | Recommended Spare Parts                                                     |

Bidders shall note that the plant and mandatory spare parts included in Schedule Nos. 1 and 2 above exclude materials used for civil, building, and other construction works. All such materials shall be included and priced under Schedule No. 4, Installation and Other Services.

- 11.3 In the Schedules, Bidders shall give the required details and a breakdown of their prices as follows:
- (a) Plant to be Supplied from Abroad (Schedule of Price No. 1):
    - (i) the price of the plant shall be quoted carriage, insurance paid freight and inland transportation (CIP)-(Project Site) (along with

- breakup as CIF (Pakistani Seaport i.e., CFR (Pakistani seaports) and Insurance) and inland transportation including all direct taxes except those given in Subclause IB 11.3(a)(iv);
- (ii) Inland Transportation including all taxes applied thereon.
  - (iii) the total price for the plant.
  - (iv) all customs duties and other taxes paid or payable in relation to clearance of Plant from port in the Employer's country on the plant if the contract is awarded to the Bidder; and
- (b) Plant Supplied from Within the Employer's Country (Schedule of Price No. 2):
- (i) the price of the plant shall be quoted on an EXW Incoterm basis (ex works, ex factory, ex warehouse, ex showroom, as applicable), including all customs duties and sales and other taxes already paid or payable on the components and raw material used in the manufacture or assembly of plant quoted ex works or ex factory, or on the previously imported plant of foreign origin quoted ex warehouse, ex showroom;
  - (ii) Inland Transportation including all taxes applied thereon
  - (iii) The total price for the plant.
  - (iv) Sales tax and other taxes payable in the Employer's country on the plant if the contract is awarded to the Bidder, and
- (c) Design Services. (Schedule of Price No. 3). Rates or prices shall include all direct taxes, duties, levies, and charges payable in the Employer's country as of 28 days prior to the deadline for submission of Bids. PST, if any, shall be quoted separately in given column and shall not be made part of total price.
- (d) Civil Works (Schedule of Price No. 4(a)). Rates or prices shall include all direct taxes, duties, levies, and charges payable in the Employer's country as of 28 days prior to the deadline for submission of Bids. PST shall be quoted separately in given column and shall not be made part of total price.
- (e) Installation and Other Services (Schedule of Price No. 4 (b)) shall be quoted separately and shall include rates or prices for insurance, all labor, contractor's equipment, temporary works, materials, consumables, and all matters and things of whatsoever nature, including operations and maintenance services, the provision of operations and maintenance manuals, training, etc., where identified in the Bidding Document, as necessary for the proper execution of the installation and other services, including all direct taxes, duties, levies, and charges payable in the Employer's country as of 28 days prior to the deadline for submission of bids. PST shall be quoted separately in given

column and shall not be made part of total price.

- (f) Recommended spare parts (Schedule No. 6) shall be quoted separately from those specified in either subparagraph (a) or (b) above in accordance with the origin of the spare parts.
- 11.4 The current edition of Incoterms, published by the International Chamber of Commerce shall govern.
- 11.5 The prices shall be either fixed or adjustable as specified in the Conditions of Contract.
  - (a) In the case of Fixed Price, prices quoted by the Bidder shall be fixed during the Bidder's performance of the contract and not subject to variation on any account. A Bid submitted with an adjustable price quotation will be treated as nonresponsive and rejected pursuant to Clause IB 27A.
  - (b) In the case of Adjustable Price, prices quoted by the Bidder shall be subject to adjustment during performance of the contract to reflect changes in the cost elements such as labor, material, transport, and contractor's equipment in accordance with the procedures specified in the corresponding appendix to the Contract Agreement. A Bid submitted with a fixed price quotation will be treated as non-responsive and be rejected.
- 11.6 If Bids are being invited for individual lots (contracts) or for any combination of lots (packages). Bidders wishing to offer any price reduction (discount) for the award of more than one contract shall specify in their Letter of Price Bid the price reductions applicable to each package, or alternatively, to individual contracts within the package, and the manner in which the price reductions will apply.
- 11.7 The bidder shall fill in rates and prices for all items of the Works described in the Schedule of Prices. Items against which no rate or price is entered by a bidder will not be paid for by the Employer when executed and shall be deemed covered by rates and prices for other items in the Schedule of Prices.
- 11.8 The bidder's separation of price components in accordance with Sub-Clauses IB 11.1 & IB 11.3 above, will be solely for the purpose of facilitating the comparison of bids by the Employer/Engineer and will not in any way limit its right to Contract on any of the terms offered.
- 11.9 Any discount offered shall be valid for at least the period of validity of the bid. A discount valid for lesser period shall be considered null and void.

#### **IB.12 Currencies of Bid**

12.1 Prices shall be quoted in the following currencies:

- a. For Goods which the bidder will supply for Contract from outside Pakistan (Schedule of Price No. 1) and Design Services (Schedule of Price No. 3), the prices shall be quoted either in U.S. Dollars or in any other freely convertible currency. While the Chinese Bidders shall quote in CNY. In case of quotation in any other currency, the bidder shall be responsible for any delay in opening of L/C (if occurred) due to any regulatory measure by State Bank of Pakistan.
- b. For Goods which the bidder will supply for Contract from within Pakistan (Schedule of Price No. 2), civil works (Schedule of Price No. 4(a)), and installation services (Schedule of Price No. 4 (b)), the prices shall be quoted in the Pak. Rupees.

12.2 Further, a bidder expecting to incur a portion of its expenditure in the performance of the Contract in more than one currency (but use no more than 3 foreign currencies), and wishing to be paid accordingly, shall so indicate in its bid.

12.3 The currencies of payment shall be as stated in Particular Conditions of Contract. However, provisions in Sub-Clauses 12.1 & 12.2 above, shall not in any way constitute a contractual or legal binding on the Employer for the payment in the currencies required by the Contractor.

**IB.13 Documents Establishing Bidder's Eligibility And Qualifications**

13.1 Pursuant to Clause IB.9, the bidder shall furnish, as part of its bid, documents establishing the bidder's eligibility to bid and its qualifications to perform the Contract if its bid is accepted.

13.2 The documentary evidence of the bidder's eligibility to bid (Form-ELI-1 of Appendix-B to ITB along with documents mentioned therein) shall establish to the Employer's satisfaction that the bidder, at the time of submission of its bid is from an eligible source country as defined under Clause IB.2.

13.3 Bidder shall submit with its bid the following to establish its qualification to perform the Contract if its bid is accepted, to the Employer's/Engineer's satisfaction:

- (a) documentary evidence that the Bidder has the experience required as per sub-clauses IB 13.4 (a) & (b) necessary to perform the Contract i.e. Forms EXP-1, and EXP-2 of Appendix-B to ITB along with document required therein; and

- (b) documentary evidence that the Bidder has the financial capability and has access to financial resources required as per sub-clauses IB 13.4 (c), (d) & € necessary to perform the Contract i.e. Forms FIN-1, FIN-2, FIN-3 & FIN-4 of Appendix-B to ITB along with document required therein.

#### 13.4 **Bidder's Qualification Criteria:**

Qualification of a bidder shall be evaluated based on following criteria which the bidder must fulfill:

[Provided further in case a Bidder is determined to be the lowest evaluated substantially responsive in more than one Lot, the aggregate requirements delineated under Sub-Clause IB.13.4 hereof shall apply. In such case, the Employer will reserve right to choose most beneficial scenario for award of Contract.

Note: The aggregate requirements shall apply only to the Financial Criteria, i.e., Average Annual Turnover and Financial Resources, as delineated under Sub-Clauses IB.13.4(c) and (d) hereof.]

##### **a) Contract Experience:**

- (i) The bidder (as main contractor, Management contractor or JV / Consortium partner) shall have executed **One (01) 500 kV or higher voltage bundled transmission line or three (3) 220kV bundled transmission line** project(s) of length equaling to at least **25.5 km (for Lot-I), 24.5 km (for Lot-II), 15 km (for Lot-III), 16 km (for Lot-IV), 14.5 km (for Lot-V), 16 km (for Lot-VI), 15 km (for Lot-VII), 16 km (for Lot-VIII), 14.5 km (for Lot-IX), and 16 km (for Lot-X)** (on cumulative basis) **in past ten (10) years** which have been in operation for at least last two (2) years as of bid opening date. The executed work shall include detail survey, sub-soil investigations, construction, construction of towers conventional foundations, erection of tower, stringing, testing and commissioning of the line.

Note-I: In case of specialized work like pile foundations or through hilly terrain or river crossing, the bidder may propose subcontractor having similar experience of 5 years if requirement not met by the bidder.

Note-II: If the contractor has not executed any EPC project in the past as sole entity, they have to propose an engineering firm/ sub-contractor meeting with the following criteria:

“The engineering firm/sub-contractor shall have designed (electrical and civil) at least one Line / Substation project in last five (05) years of same or higher voltage level and same nature which shall be in services for last (02) two years as of bid opening date.”

In case of JV, Lead partner shall exhibit the above-mentioned criteria while other partner(s) shall have to exhibit the following criteria:

- (ii) In case of JV, the partners other than the lead partner, shall have executed (as main contractor, Management contractor or JV / Consortium partner) **One (1) 500 kV or higher voltage bundled transmission line or three (3) 220 kV bundled transmission line** project(s) of length equaling to at least **12.75 km (for Lot-I), 12.25 km (for Lot-II), 7.5 km (for Lot-III), 8 km (for Lot-IV), 7.25 km (for Lot-V), 8 km (for Lot-VI), 7.5 km (for Lot-VII), 8 km (for Lot-VIII), 7.25 km (for Lot-IX), and 8 km (for Lot-X)** (on cumulative basis) **in past ten (10) years** which have been in operation for at least **last two (2) years** as of bid opening date. The executed work shall include detail survey, sub-soil investigations, construction, construction of towers conventional foundations, erection of tower, stringing, testing and commissioning of the line.

**b) Historical Financial Performance:**

Historical Financial Performance: Submission of audited balance sheets or, if not required by the law of the Bidder's country, other financial statements acceptable to the Employer, for the last five (05) years to demonstrate the current soundness of the Bidder's financial position and its prospective long-term profitability. All financial statements will be interpreted in terms of equivalent USD converted as per National Bank TT&OD rates applicable as on 28 days prior to the technical bid opening date. As a minimum, the Bidder's net worth calculated as the difference between total assets and total liabilities should be positive for last One (01) Year.

The Employer will take into account the following criteria to verify the financial qualification of the Bidder.

**c) Average Annual Turnover**

Minimum average annual turnover for each lot as per following Table:

| <b>Lot Identification</b> | <b>Required Minimum Average Annual Turnover</b> |
|---------------------------|-------------------------------------------------|
| Lot-I                     | PKR 4,047.2 Million                             |
| Lot-II                    | PKR 4,521.4 Million                             |
| Lot-III                   | PKR 2,217.9 Million                             |
| Lot-IV                    | PKR 2,489.3 Million                             |
| Lot-V                     | PKR 2,665.6 Million                             |
| Lot-VI                    | PKR 2,953.6 Million                             |
| Lot-VII                   | PKR 1,392.9 Million                             |
| Lot-VIII                  | PKR 1,537.2 Million                             |
| Lot-IX                    | PKR 1,688.7 Million                             |
| Lot-X                     | PKR 1,661.1 Million                             |

calculated as best of three years total certified payments received for contracts in progress or completed, within the last 05 years. The average annual

turnover may include turnover of affiliates and subsidiaries to the extent of shareholding percentage of the Bidding company provided the turnover is accrued from similar business activity as the Bidding company.

In case of JV, all the JV partners shall jointly meet the requisite criteria with the lead partner and other partner(s) meeting not less than 40% and 25% respectively of the said criteria.

#### **d) Financial Resources**

The Bidder must demonstrate access to, or availability of, financial resources such as liquid assets, lines of credit (issued specifically for the subject project), and other financial means to meet the total cash flow demands of this contract which is being considered equal to the amount given in the Table Below for each lot:

| <b>Lot Identification</b> | <b>Required Financial Resources</b> |
|---------------------------|-------------------------------------|
| Lot-I                     | PKR 2,023.6 Million                 |
| Lot-II                    | PKR 2,260.7 Million                 |
| Lot-III                   | PKR 1,108.9 Million                 |
| Lot-IV                    | PKR 1,244.6 Million                 |
| Lot-V                     | PKR 1,332.8 Million                 |
| Lot-VI                    | PKR 1,476.8 Million                 |
| Lot-VII                   | PKR 696.4 Million                   |
| Lot-VIII                  | PKR 768.6 Million                   |
| Lot-IX                    | PKR 844.3 Million                   |
| Lot-X                     | PKR 830.5 Million                   |

plus 25% of the Bidder's commitments for running contracts. (Information to be submitted in prescribed Form FIN-3 of Appendix-B to Bid given in Section-I of the Bidding Documents).

The Bidder shall provide his current work commitments in form specified in the Bidding Documents.

The bidder shall provide bank certificate for his lines of credit on the prescribed Form specified in the Bidding Documents.

*[Note: Credit Lines submitted after opening of bids shall not be acceptable. Any withdrawal of the credit lines from the bidder's creditors during validity of bid shall be considered a withdrawal of bid.]*

In case of JV, all the JV partners shall jointly meet the above criteria with lead partner and other partner(s) meeting not less than 40% and 25% respectively of the said criteria.

**e) Key Personnel:**

The Bidder shall have the personnel for the key positions to be deployed against each lot for meeting the following requirements: (Information to be submitted in Form PER-2 of the Bidding Documents).

| Sr. No. | Position                                | Total Work Experience (years) | Experience in Similar Works (years) | No. of Key Persons for Each Lot |
|---------|-----------------------------------------|-------------------------------|-------------------------------------|---------------------------------|
| 1       | Project Manager <sup>1</sup>            | 15                            | 10                                  | 1                               |
| 2       | Procurement Specialist                  | 10                            | 5                                   | 1                               |
| 3       | Design Team Leader <sup>1</sup>         | 10                            | 5                                   | 1                               |
| 4       | Construction Manager <sup>1</sup>       | 10                            | 5                                   | 1                               |
| 5       | Site Engineer (Civil) <sup>1</sup>      | 5                             | 3                                   | 1                               |
| 6       | Site Engineer (Electrical) <sup>1</sup> | 5                             | 3                                   | 1                               |
| 7       | Testing & Commissioning Engineer        | 10                            | 8                                   | 1                               |
| 8       | Environmental/HSE Officer <sup>2</sup>  | 8                             | 3                                   | 1                               |

<sup>1</sup> The above personnel shall be graduate Engineer minimum.

<sup>2</sup> Environmental/HSE Officer shall be graduate (16 years education) in Environmental Sciences / Environmental Engineering. He/She should also have OSHA/NEBOSH certification with 03 years of professional experience in project implementation.

*All the participating bidders shall provide an undertaking with the bid that in case a bidder does not meet the key personnel requirement stipulated above, the deficient key personnel will be replaced with personnel having requisite experience during the Pre-Award Negotiations in case of award of contract. The bid of any bidder not accompanied by an undertaking to this effect, even after post bid clarification, shall be rejected.*

**Joint Venture Related Requirements**

- (a) One of the joint venture partners shall be nominated as being in-charge and this authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the joint venture partners.
- (b) The partner-in-charge shall be authorized to incur liabilities, receive payments and receive instructions for and on behalf of any or all partners of the joint venture.



- (c) A copy of the agreement entered into by the joint venture partners shall be submitted with the bid stating the conditions under which it will function, its period of duration, the persons authorized to represent and obligate it and which persons will be directly responsible for due performance of the Contract and can give valid receipts on behalf of the joint venture, the proportionate participation of the several firms forming the joint venture, and any other information necessary to permit a full appraisal of its functioning. No amendments / modifications whatsoever in the joint venture agreement shall be agreed to between the joint venture partners without prior written consent of the Employer.
- (d) The maximum J.V. partners shall not be more than three (03).

#### **IB.14 Documents Establishing Goods' Eligibility and Conformity to Bidding Documents**

- 14.1 Pursuant to Clause IB.9, the bidder shall furnish, as part of its bid, documents establishing the eligibility and conformity to the Bidding Documents of all Goods and Services which the bidder proposes to perform under the Contract.
- 14.2 To establish the eligibility of the plant and services in accordance with IB 3, Bidders shall submit following with the bid.:
  - (i) The Country of Origin Declaration Form (Schedule F to Bid).
  - (ii) Manufacturer's Authorization (Schedule L to Bid) in the case of a bidder offering to supply plant under the Contract which the bidder did not manufacture or otherwise produce.
  - (I) In case of following equipment, bidder shall establish that the manufacturer has design/ manufacturing experience of similar equipment/goods of similar or higher rating and capacity as that of proposed equipment.
    - 1. 500 kV Steel Towers
    - 2. ACSR Drake Conductor & Shieldwire
    - 3. OPGW & Accessories
    - 4. Insulator Hardware Assemblies (with Pre-RTV coated insulators)
    - 5. Hardware for OPGW & Shieldwire
    - 6. Transmission Line Hardware Accessories and Dampers
    - 7. Grounding Material for Overhead Transmission Lines

Such equipment/goods supplied by the manufacturer should have been in satisfactory operation for a continuous period of at least **three years** [at least one end user certificate to be outside country of manufacturer] or satisfactory operational experience of **one year** in NGC/DISCOs/ K-Electric prior to

deadline for submission of Bids.

14.3 The documentary evidence of the Goods and Services' conformity to the Bidding Documents may be in the form of literature, drawings and data and shall furnish:

- (a) A detailed description of the Goods, essential technical and performance characteristics in response to the Section 8 (Specifications – Special Provisions) and Volume-II (Specifications – Technical Provisions).
- (b) Completely filled Schedule of Technical Data (Schedule-A to Bid) of each item.
- (c) Complete set of technical information, description data, literature and drawings as required in accordance with Schedule A to Bid, Specific Plant Data. This will include but not be limited to the following:
  - (i) A sufficient number of drawings, photographs, catalogues, illustrations and such other information as is necessary to illustrate clearly the significant characteristics such as general construction dimensions and other relevant information about the Goods/Plant to be furnished.
  - (ii) Details of equipment and machinery with capacity.
  - (iii) The approximate weight and dimension of the main components, a brief description of the principal materials and fabrication processes to be used and recommended methods of assembly.
  - (iv) Any other information which is required for evaluation purposes.
- (d) Type Test Reports of offered equipment as per Section-8 including the complete information regarding outsourced components/ parts of the equipment type tested. The Report shall also include complete identification of the equipment along with drawings stamped by the concerned lab;
- (e) An unconditional Undertaking duly signed and stamped by bidder duly supported by manufacturer(s) that in case of award of contract if submitted type test reports are not according to NGC type test policy, he will carry out type tests as per NGC Type Test Policy within the quoted Bid price and without affecting the delivery/ completion period as mentioned in the Bidding Documents.
- (f) A list giving full particulars, including available sources, of all spare parts and special tools necessary for the proper and continuing functioning of the plant for the period of 10 years, following completion of Works in accordance with provisions of the contract; and
- (g) A clause-by-clause commentary on Technical Provisions, provided with

the Bidding Documents, demonstrating the Goods' and Services' substantial responsiveness to those Specifications or a statement of deviations and exceptions to the provisions of the Technical Provisions as required in Schedule G to Bid.

- 14.4 For purpose of the commentary to be furnished pursuant to Sub-Clause 14.3(g) above, the Bidder shall note that standards for workmanship, material and equipment, and references to brand names or catalogue numbers, designated by the Engineer in the Technical Provisions are intended to be descriptive only and not restrictive. The bidder may substitute alternative standards, brand names and/or catalogue numbers in its bid, provided that it demonstrates to the Engineer's satisfaction that the substitutions are substantially equivalent or superior to those designated in the Technical Provisions. Copies of the standards proposed by the bidder other than those specified in the Bidding Documents shall be furnished.
- 14.5 The Bidder shall propose, in order of his priority; plant, equipment or goods of not more than two Manufacturers. Employer at his own jurisdiction may evaluate the plant, equipment or goods of only one of such Manufacturers.

#### **IB 14A Technical Proposal, Subcontractors**

- 14A.1 The Bidder shall furnish a Technical Proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in Bidding Documents, in sufficient detail to demonstrate the adequacy of the Bidders' proposal to meet the work requirements and the completion time. To furnish Technical Proposal, bidder shall submit following with the bid:
- (i) Forms given in Schedule B to Bid, mentioning details of Site Organization, work methodology and Mobilization Schedule.
  - (ii) Construction Schedule (Schedule C to Bid) giving detail of activities along with timelines thereof.
  - (iii) List and detail of proposed personnel (Schedule D to Bid).
  - (iv) Detail of equipment to be used in construction, etc. (Schedule I to Bid).
- 14A.2 For major items of Works as listed by the Employer in sub-clause IB 14.2 (iii) above and key activities as listed in sub-clause IB 13.4 (b), which the Bidder intends to purchase or subcontract, the Bidder shall give details of the name and nationality of the proposed Subcontractors, including Manufacturers, for each of those items in Form SUBCON of Schedule E to Bid. In addition, the Bidder shall include in its Bid Form EXP-3 of Appendix B to ITB along with information establishing compliance with the requirements specified by the Employer for these items. Bidders are free to propose up to two subcontractors

against each item of the Works. Quoted rates and prices will be deemed to apply to whichever Subcontractor is appointed, and no adjustment of the rates and prices will be permitted.

- 14A.3 The Bidder shall be responsible for ensuring that any Subcontractor proposed complies with the requirements of sub-clauses IB 2.1 (i), (ii), (iv), (v) & (vii) as applicable, and that any plant, or services to be provided by the Subcontractor comply with the requirements of clause IB 3 and clause IB 14.

### **IB.15 Bid Security**

- 15.1 Each bidder shall furnish, as part of his Technical Bid, a Bid Security in the amount given in the Table below:

| <b>Lot Identification</b> | <b>Required Bid Security</b> |
|---------------------------|------------------------------|
| Lot-I                     | PKR 162 Million              |
| Lot-II                    | PKR 181 Million              |
| Lot-III                   | PKR 89 Million               |
| Lot-IV                    | PKR 100 Million              |
| Lot-V                     | PKR 107 Million              |
| Lot-VI                    | PKR 119 Million              |
| Lot-VII                   | PKR 56 Million               |
| Lot-VIII                  | PKR 62 Million               |
| Lot-IX                    | PKR 68 Million               |
| Lot-X                     | PKR 67 Million               |

or an equivalent amount in a freely convertible currency, converted at the National Bank of Pakistan (NBP) TT&OD selling rate applicable 28 days prior to the date of opening of the Technical Bids. Bid Security is required to be submitted in original before bids submission deadline.

- 15.2 The Bid Security shall be, at the option of the Bidder, in the form of Deposit at Call or a Guarantee issued by a Scheduled Bank in Pakistan or from a foreign bank duly counter guaranteed by a Scheduled Bank in Pakistan in favor of the Employer (Chief Engineer (MP&M) NTDC, 8th Floor-Shaheen Complex, Egerton Road, Lahore) on the prescribed Form annexed to these Documents valid for a period 28 days beyond the Bid Validity date or beyond any period of extension if requested under sub-clause IB 16.2. The Bid Security of Joint Venture shall be in the name of Joint Venture submitting the Bid or in the name of all members of JV (JV may authorize any of its member to submit bid security. However, it will be clearly mentioned that Bid Security is submitted on behalf of JV).

For avoidance of doubt, a Bid Security issued by a foreign bank but not counter guaranteed by a Scheduled Bank in Pakistan *[or a counter guarantee which impacts rights of Employer to encash the Guarantee on 1<sup>st</sup> written notice from Bank in Pakistan]* shall

not be acceptable and rejected as non-responsive.

[Any mode for submission of bid security apart from aforementioned like Swift Code or Crossed Cheque shall not be acceptable]

Moreover, the bid shall be considered non-responsive in case of non-receipt of original Bid Security (in hard copy) in accordance with ITB 15.1 or 15.2 before the bids closing deadline.

- 15.3 The Bid Security is required to protect the Employer against the risk of bidder's conduct which would warrant the security's forfeiture, pursuant to Sub-Clause 15.7 hereof.
- 15.4 A bid must be accompanied by an acceptable Bid Security that is unconditional, irrevocable and callable. If a Bidder submits a Bid Security that has following discrepancies (to the extent mentioned against each), the Purchaser shall request the Bidder to submit a compliant Bid Security within fourteen (14) calendar days of receiving such request. Failure to provide a compliant Bid Security within the prescribed period of receiving such a request shall cause the rejection of the Bid. Any bid accompanied by bid security with deviation greater than the extent mentioned below shall be rejected pursuant to clause IB 27A:
- i. Bid Security amount is short within 10% of Bid Security amount; and/or
  - ii. Bid Security validity period is short by a maximum of two days.
  - iii. Any changes with respect to format/text which does not hurt the right of Employer for encashment of the guarantee and does not limit the obligation of the bidder as required in the Bidding Document/Bid Security format.
- 15.5 The bid securities of unsuccessful bidders will be returned upon award of Contract to the successful bidder or on the expiry of validity of Bid Security whichever is earlier.
- 15.6 The Bid Security of the successful bidder will be returned when the bidder has furnished the required Performance Security, pursuant to Clause IB.34 and signed the Contract Agreement, pursuant to Clause IB.35.
- 15.7 The Bid Security may be forfeited:
- (a) if a bidder withdraws its bid during the period of bid validity, except as provided in sub-clause IB 16.2; or
  - (b) if a bidder does not accept the correction of his Bid Price, pursuant to Sub-Clause 26.2 hereof; or
  - (c) if the bidder is involved in Corrupt and/or fraudulent practices.
  - (d) in the case of a successful bidder, if he fails to:
    - (i) furnish the required Performance Security in accordance with

- Clause IB.34, or
- (ii) sign the Contract Agreement, in accordance with Clause IB.35.

### **IB.16 Validity of Bids**

- 16.1 Bids shall remain valid for **180 days** after the date of bid opening as prescribed in Clause IB.19. A bid valid for a shorter period shall be rejected by the Employer as nonresponsive.
- 16.2 In exceptional circumstances prior to expiry of bid validity period, the Employer may request the bidders to extend the period of validity for a specified additional period. The request and the responses thereto shall be made in writing. A bidder may refuse the request without forfeiture of his Bid Security. A bidder agreeing to the request will be required to extend the validity of his Bid Security 28 days beyond the deadline of extended bid validity period, and in compliance with Clause IB.15 in all respects.

### **IB.17 Format and Signing of Bid**

- 17.1 Bidders are particularly directed that the amount entered on the Letter of Price Bid shall be for performing the Contract strictly in accordance with the Bidding Documents.
- 17.2 All Forms, Appendices to ITB, Schedules to Bid (A to L), Schedules of Prices are to be properly completed and signed.
- 17.3 No alteration is to be made in the Form of Bid nor in the Schedules thereto except in filling up the blanks as directed. If any alteration be made or if these instructions be not fully complied with, the Bid may be rejected.
- 17.4 The Bid shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the bidder. This authorization shall consist of written Power of Attorney, duly notarized, authorizing the signatory of the bid to act for and on behalf of the Bidder.
- i. For foreign firm/bidder, board resolution and power of attorney (**duly attested by Consulate General of Pakistan/Pakistan Embassy**) are required.
  - ii. For local firm, board resolution and/or power of attorney provided on stamp paper worth Rs.1000 or as per governing law, whichever is higher, are required.

All pages of the Bid and Schedules to Bid shall be initialed and stamped by the person or persons signing the Bid. If either the Letter of Technical Bid or Letter of Price Bid are not signed, the Bid shall be rejected.

In case of non-submission or non-compliance of a valid power of attorney, post bid clarification shall be sought to submit the same or an undertaking for submission of board resolution and power of attorney (**duly attested by Consulate General of Pakistan/Pakistan Embassy**) within fourteen (14)

calendar days of receiving such request and its failure shall lead to rejection of the bid.

- 17.5 The Bid shall contain no alterations, omissions or additions, except to comply with instructions issued by the Employer, or as are necessary to correct errors made by the Bidder, in which case such corrections shall be initialed by the person or persons signing the Bid.
- 17.6 Bidders shall indicate in the space provided in the Form of Bid, their full and proper addresses at which notices may be legally served on them and to which all correspondence in connection with their Bids and the Contract is to be sent.
- 17.7 Bidders should retain a copy of the Bidding Documents as their file copy.

## **D. SUBMISSION OF BIDS**

### **IB.18 Submission of Bids**

- 18.1 The Bidder shall submit its Bid as under:
- (a) Firms are required to submit their bids through e-PADS only. However, Bid Security is required to be submitted in original before bids submission deadline.
  - (b) The Technical bid should be submitted as a single PDF file named "Tender [Tender Number] - TECHNICAL BID - [Name of Proposing Firm]".
  - (c) The Financial bid should be submitted as a single PDF file named "Tender [Tender Number] - FINANCIAL BID - [Name of Proposing Firm]".
  - (d) The Procuring Agency shall reject the bid, if the bid submitted through e-PADS found corrupt, unreadable or contains a virus.

### **IB.19 Deadline for Submission of Bids**

- 19.1 Firms are required to submit their bids through e-PADS only on or before bid submission deadline. However, Bid Security is required to be submitted in original before bids submission deadline.

Deadline for Submission of bid:

**Date: 05-10-2026**

**Time: 11:00am (Pakistan Standard Time)**

Employer's address for the purpose of Bid Security submission:

**Director General (Procurement) NGC,**  
8<sup>th</sup> Floor Shaheen Complex, Egerton Road Lahore,  
Pakistan  
Telephone No. 92-42-99202597

E-mail address: [dg.procurement@ngc.gov.pk](mailto:dg.procurement@ngc.gov.pk)

- 19.2 Bids submitted through telegraph, telex, fax or e-mail shall not be considered.
- 19.3 The Employer may, at its discretion, extend the deadline for submission of bids by issuing an addendum in accordance with Clause IB.7, in which case all rights and obligations of the Employer and the bidders previously subject to the original deadline will thereafter be subject to the deadline as extended.

#### **IB.20 Late Bids**

- 20.1 The Procuring Agency shall not consider for evaluation any Bids that arrive after the deadline for submission of bids including but not limited to following situations;
- i. Against which the Bid Security in original is received after the deadline for submission of Bids.
  - ii. Against which bids are not received through e-PADs within bid submission deadline.
  - iii. Against which the bid/ pdf file received through e-PADs is found corrupt, unreadable or contains a virus.

#### **IB.21 Modification, Substitution and Withdrawal of Bids**

- 21.1 Withdrawal of a bid during the interval between the deadline for submission of bids and the expiration of the period of bid validity specified in the Form of Bid may result in forfeiture of the Bid Security pursuant to Sub-Clause IB.15.7.

### **E. BID OPENING AND EVALUATION**

#### **IB.22 Bid Opening**

- 22.1 The Employer shall open the Technical Bids in public at the address, on the date, and time specified in the Invitation For Bids in the presence of Bidder's designated representatives and anyone who choose to attend. The Bidder's representatives who are present shall be requested to sign a register evidencing their attendance. Further the attendance will also be marked through e-PADS.
- 22.2 The Technical Bids, except the Bids rejected pursuant to Sub-Clause IB.20.1 shall be opened one at a time, and the following read out and recorded:
- (a) the name of the Bidder;
  - (b) the receipt of original Bid Security; and
  - (c) any other details as the Employer may consider appropriate.
- 22.3 At the end of the evaluation of the Technical Bids, the Employer will invite bidders who have submitted substantially responsive Technical Bids and who



have been determined as being qualified for award to attend the opening of the Price Bids. The date, time, and location of the opening of Price Bids will be advised in writing by the Employer. Bidders shall be given reasonable notice of the opening of Price Bids.

- 22.4 The Employer will notify Bidders in writing who have been rejected on the grounds of their Technical Bids being substantially nonresponsive to the requirements of the Bidding Document.
- 22.5 The Employer shall conduct the opening of Price Bids of all Bidders who submitted substantially responsive Technical Bids, in the presence of Bidders' representatives who choose to attend at the address, on the date, and time specified by the Employer. The Bidder's representatives who are present shall be requested to sign a register evidencing their attendance. Further the attendance will also be marked through e-PADS.
- 22.6 All Price Bids shall be opened one at a time and the following read out and recorded:
- (a) the name of the Bidder;
  - (b) the Bid Prices, including any discounts and alternative offers; and
  - (c) any other details as the Employer may consider appropriate.

Only Price Bids, discounts, and alternative offers read out and recorded during the opening of Price Bids shall be considered for evaluation.

- 22.7 The Employer shall prepare a record of the opening of Price Bids that shall include, as a minimum: the name of the Bidder, the Bid Price, any discounts, and alternative offers. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders present at the time of Bid Opening.

### **IB.23 Clarification of Bids**

- 23.1 To assist in the examination, evaluation and comparison of Bids the Employer may, at its discretion, ask the Bidder for a clarification of its Bid. The request for clarification and the response shall be in writing and no change in the price or substance of the Bid shall be sought, offered or permitted, except to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Bids, in accordance with IB 26.2. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The Employer's request for clarification and the response shall be in writing.
- 23.2 If a Bidder does not provide clarifications of its Bid by the date and time set in the Employer's request for clarification, its Bid may be rejected.

### **IB 23A Deviations, Reservation and Omissions**

23A.1 During the evaluation of Bids, the following definitions apply:

- (a) "Deviation" is a departure from the requirements specified in the Bidding Document;
- (b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Document; and
- (c) "Omission" is the failure to submit part or all of the information or documentation required in the Bidding Document.

#### **IB.24 Preliminary Examination & Determination of Responsiveness of Bids**

24.1 The Employer shall examine the Technical Bid to confirm that all documents and technical documentation requested in IB 9.1(I) have been provided, and to determine the completeness of each document submitted. If any of these documents or information is missing, the Bid may be rejected.

24.2 A Technical Bid shall be rejected as non-responsive if:

- (a) Letter of Technical Bid is unsigned pursuant to IB 17.4 or altered pursuant to IB 17.3 or is missing altogether from technical proposal.
- (b) its validity is less than the specified period pursuant to IB 16.1
- (c) it indicates completion period later than specified limits.
- (d) it is not accompanied by power of attorney
- (e) bidder or its any member in case of Joint Venture has participated in more than one bid;
- (f) it covers scope of work given in Bidding Documents partially.
- (g) if Technical Bid and Price Bid are found in one pdf file
- (h) Bid is not accompanied by a substantially compliant bid security as per IB 15.4
- (i) The bid is not accompanied by Beneficial Ownership Declaration Performa as per requirements/Performa delineated in S.R.O 152(I)/2022.
- (j) Any other discrepancy is found that constitutes ground for rejection pursuant to Bidding Documents.

24.3 Prior to the detailed evaluation, pursuant to Clause IB.25 the Employer will determine the substantial responsiveness of each Bid to the Bidding Documents. The Employer's determination of a Bid responsiveness will be based on the contents of the Bid itself without recourse to irrelevant evidence. A substantially responsive Bid is one which conforms to all the terms and conditions of the Bidding Documents without material deviations, reservation or omission. A material deviation, reservation or omission is one:

- (i) which affect in any substantial way the scope, quality or performance of the Works;

- (ii) which limits in any substantial way, inconsistent with the Bidding Documents, the Employer's rights or the Bidder's obligations under the Contract; or
  - (iii) whose rectification/adoption would affect unfairly the competitive position of other Bidders presenting substantially responsive Bids.
- 24.4 The Employer shall examine the technical aspects of the Bid submitted in accordance with IB 14A, Technical Proposal, in particular to confirm that all requirements of Section 8 (Specifications – Special Provisions) and Volume-II (Specifications – Technical Provisions) have been met without any material deviation, reservation, or omission.
- 24.5 A Bid determined as substantially non-responsive will be rejected and will not subsequently be made responsive by the Bidder by correction of the material deviation, reservation or omission.
- 24.6 Provided that a Bid is substantially responsive, the Employer may waive any nonconformities in the Bid that do not constitute a material deviation, reservation, or omission.
- 24.7 Provided that a Bid is substantially responsive, the Employer may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities in the Bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any aspect of the Price Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.
- 24.8 Provided that a Bid is substantially responsive, the Employer shall rectify quantifiable nonmaterial nonconformities related to the Bid Price. To this effect, the Bid Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component. The adjustment shall be made as per IB 27A.

#### **IB.25 Detailed Evaluation of Technical Bids**

- 25.1 The Employer will carry out a detailed technical evaluation of the Bids not previously rejected as being substantially nonresponsive, to determine whether the technical aspects are in compliance with the Bidding Document. The Bid that does not meet minimum acceptable standards of completeness, consistency, and detail, and the specified minimum and/or maximum requirements for specified functional guarantees, will be treated as nonresponsive and hence rejected. To reach such a determination, the Employer will examine and compare the technical aspects of the bids on the basis of the information supplied by the Bidders, taking into account the following:

- (a) overall completeness and compliance with the Technical Provisions; deviations from the Technical Provisions; conformity of the plant and services offered with specified performance criteria; suitability of the plant and services offered in relation to the environmental and climatic conditions prevailing at the site; and quality, function and operation of any process control concept included in the Bid. The Bid that does not meet minimum and/or maximum acceptable standards of completeness, consistency, and detail will be rejected for non-responsiveness;
- (b) Evaluation of Bidder's experience pursuant to IB 13.4 and IB 13.5 if applicable.
- (c) Evaluation of Subcontractor's and/or manufacturer's experience pursuant to IB 14.2, IB 14A.2 & IB 14A.3 as applicable.
- (d) Evaluation of Operational Experience of equipment offered pursuant to IB 14.2.
- (e) Compliance of offered equipment, listed in Form of Proposed Subcontractors / Manufacturer for Major item of Plant and Services (Form SUBCON of Schedule E to Bid) to Technical Provisions and Specifications therein. This shall include but not limited to evaluation of Schedule of Technical Data of the equipment pursuant to Volume-II (Specification - Technical Provisions). Non-compliance of offered equipment including but not limited to non-submission of Schedule of Technical Data may result in rejection of Bid.
- (f) Evaluation of Type Test Reports of the equipment, listed in Form of Proposed Subcontractors / Manufacturer for Major item of Plant and Services, pursuant to Section-2.

Pursuant to IB 14.3€, in case of failure to submit an Undertaking of type tests as per NGC type test policy along with the bid or in response to post bid clarification, such manufacturer shall not be accepted and bidder will be bound to replace the same with acceptable manufacturer. In case of noncompliance, the bid shall be rejected.

All Type Test certificates/reports, reference list, etc. shall be in English language.

- (g) An assessment of the Bidder's technical capacity to mobilize key equipment and personnel for the contract consistent with its proposal regarding work methods, scheduling, and material sourcing in sufficient detail and fully in accordance with the requirements stipulated in Section 8.

Non-compliance with equipment and personnel requirements described in Section 8 shall not normally be a ground for bid rejection and such non-compliance will be subject to clarification during bid evaluation and rectification prior to contract award.

If Bidder proposes to subcontract any key activity **on site** (given in IB 13.4 (b)), then he shall submit relevant information above in respect of subcontractor.

- 25.2 The determination of qualification of Bidder, subcontractor or manufacturer shall be based upon an examination of the documentary evidence of the Bidder's, subcontractor's or manufacturer's qualifications submitted by the Bidder. The determination shall not take into consideration the qualifications of other firms such as the Bidder's, subcontractor's or manufacturer's subsidiaries, parent entities, affiliates, subcontractors, or any other firm(s) different from the Bidder, subcontractor or manufacturer else otherwise specified. The Employer/Engineer will have the right to verify the particulars regarding the plant and other related information furnished with the bid, and the joint venture as well as the partners thereof shall be liable for disqualification in the event of any mis-statement/mis-representation on their part
- 25.3 An affirmative determination shall be a prerequisite for the opening and evaluation of a Bidder's Price Bid. The Employer reserves the right to reject the bid of any bidder found to be in circumstances described in GCC 45.2 €. A negative determination shall result into the disqualification of the Bid, in which event the Employer shall return the unopened Price Bid to the Bidder.
- 25.4 The participation of the proposed manufacturers and subcontractors should be confirmed with a letter of intent between the parties, as needed. Should a manufacturer or subcontractor be determined to be unacceptable, the Bid will not be rejected, but the Bidder will be required to propose, without changing its bid price, an acceptable substitute manufacturer or subcontractor meeting the minimum technical specifications stated in Volume-II (Specification – Technical Provisions). If a Bidder does not provide an acceptable substitute manufacturer or subcontractor by the date and time set in the Employer's request for substitution of manufacturer or subcontractor, its Bid may be rejected.

#### **IB.26 Conversion to Single Currency, Correction of Arithmetic Errors**

- 26.1 To facilitate evaluation and comparison, the Employer/Engineer will convert, all Bid Prices/values expressed in the amount in various currencies in which Bid Price is payable, to Pak. Rupees at the Telegraphic Transfer and Over Draft (TT&OD) composite (selling) exchange rates published/authorized by National Bank of Pakistan and applicable to similar transactions, on the date of the opening of technical Bids.
- 26.2 During the evaluation of Price Bids, the Employer shall correct arithmetical errors on the following basis:
- (a) where there are errors between the total of the amounts given under the column for the price breakdown and the amount given under the Total Price, the amounts given under the column for the price breakdown shall prevail and the Total Price will be corrected accordingly, unless in

the opinion of the Employer there is an obviously gross misplacement of the decimal point in the unit rate, in which case the line-item total as quoted will govern and the unit rate will be corrected.

- (b) where there are errors between the total of the amounts of Schedule Nos. 1 to 4 and the amount given in Schedule No. 5 (Grand Summary), the total of the amounts of Schedule Nos. 1 to 4 shall prevail and the Schedule No. 5 (Grand Summary) will be corrected accordingly;
- (c) if there is a discrepancy between the grand total price given in Schedule No. 5 (Grand Summary) and the bid amount in point (1) of the Letter of Price Bid, the grand total price given in Schedule No. 5 (Grand Summary) will prevail and the bid amount in point (1) of the Letter of Price Bid will be corrected; and

if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetical error, in which case the amount in figures shall prevail subject to (a), (b), and (c) above. If the Bidder does not accept the corrected amount of Bid, his Bid will be rejected and his Bid Security forfeited.

#### **IB.27. Domestic Preference**

- 27.1 In the comparison of evaluated Bids, the Goods manufactured in Pakistan, will be granted a margin of preference in accordance with the following procedures, provided the bidder shall have established to the satisfaction of Employer that the manufacturing cost of such Goods includes a domestic value addition equal to at least 20% of the ex-factory Bid price of such Goods as certified by Engineering Development Board (EDB). Bidders applying for domestic preference shall fill in Appendix C to these Instructions to substantiate their claim. In case of Non submission of information required under Appendix-C, admissibility for price preference shall not be applicable without any further communications/clarifications.
- 27.2 The Employer/Engineer will first review the Bids to determine, the Bid group classification in accordance with Sub-Clause 10.2 hereof.
- 27.3 The comparison shall be Ex-factory price of the Goods to be offered from within Pakistan (such prices to include all costs as well as custom duties and taxes paid or payable on raw materials and components incorporated or to be incorporated in the Goods) and the DDP (CIP + Customs duty, sales tax and other import charges) Pakistan seaport price of the Goods to be offered from outside Pakistan.
- 27.4 The lowest evaluated bid of each Group shall first be determined by comparing all evaluated bids in each Group among themselves taking into account:
  - (a) In the case of Goods manufactured in Pakistan, sales tax, local body charges and other similar taxes which will be payable on the furnished

Goods in Pakistan.

- (b) In the case of Goods of foreign origin offered from abroad, customs duties, sales tax and other import charges which will be payable on furnished Goods in Pakistan.
- (c) In the case of Goods of foreign origin already located in Pakistan, customs duty, sales tax and import charges on CIP price as applicable for Sub-Clause 27.4(b) here above.

27.5 The price preference to Group A bids will be:

- (i) 15% of the ex-factory bid price, if the value addition through indigenous manufacturing is at least 20%;
- (ii) 20% of the ex-factory bid price, if the value addition through indigenous manufacturing is over 20% and up to 30%; and
- (iii) 25% of the ex-factory bid price, if the value addition through indigenous manufacturing is over 30%.

27.6 The applicable price preference i.e., as per Sub-Clause 27.5 here above will be applied to Group A Bid by reducing the ex-factory bid price.

(Note: - Landed cost will be calculated irrespective of the application of domestic preference.)

#### **IB 27A Evaluation and Comparison of Price Bids**

27A.1 Prior to detailed evaluation of Price Bids, the Employer shall examine:

- (a) signature and alteration of Letter of Price Bid.
- (b) fixation or adjustability of quoted price.
- (c) Without limiting the particular criteria, the Employer may take into account the following in the Evaluation of Bids:
  - i. Non-performance by a Bidder on previous contracts with Employer or others;
  - ii. The quality of a Bidder's performance on previous contracts with Employer or others;
  - iii. Anticipated or ongoing claims with or in connection with a Bidder;
  - iv. Any security or safety concerns which Employer may have in respect of a Bidder or its facilities, subcontractors or suppliers;
  - v. The results of any interview with a Bidder or supplied references; or
  - vi. Any knowledge of or experience with a Bidder or its principals, directions, officers and employees.

27A.2 Price Bid shall be rejected if:

- (a) Letter of Price Bid is unsigned pursuant to IB 17.4 or altered pursuant to IB 17.3 or missing altogether in the price bid.
- (b) the quoted price is adjustable during currency of the contract when bidders are required to quote fixed price, and vice versa

27A.3 To evaluate a Price Bid, the Employer shall consider the following:

- (a) the bid price, excluding provisional sums and the provision, if any, for contingencies in the Price Schedules;
- (b) price adjustment for correction of arithmetical errors in accordance with IB 26.2;
- (c) price adjustment due to discounts offered in accordance with IB 11.6;
- (d) price adjustment due to quantifiable nonmaterial nonconformities in accordance with IB 24.8;
- (e) converting the amount resulting from applying (a) to (c) above, if relevant, to a single currency in accordance with IB 26.1;
- (f) application of domestic preference as per clause IB 27, if applicable;
- (g) assessment whether the bid is abnormally low in accordance with IB 27A.6; and
- (h) Financial Adjustment of Bid Price (Commercial Aspects)

The evaluation of a bid will take into account, in addition to the Bid Price, the following commercial factors (adjustments) in the manner and the extent indicated hereof, to determine the Evaluated Bid Price.

#### **Price Adjustment for Deviation in Terms of Payment**

If a bid deviates from the terms of payment/payment conditions as specified in the Conditions of Contract and if such deviation is considered acceptable to the Employer, mark-up earned for any earlier payments involved in the terms outlined in the bid as compared to those stipulated in the Conditions of Contract shall be calculated at the following mark-up rates:

- For foreign currency component: 8% per annum
- For local currency component: KIBOR + 4.5% per annum

and shall be added to the Corrected Total Bid Price for comparison purpose only.

- (i) Financial Adjustment of Bid Price (Technical Aspects)

In addition to price adjustment due to commercial aspects, the price of bid will also be adjusted on account of minor technical omission/non-compliance and due to minor omissions or missing items in the scope of work, services, etc. in the manner and to the extent indicated hereof, to determine the Evaluated Bid Price.



(I) Price Adjustment for Completeness in Scope of Work

- (i) Scope of work of each bid will be examined for completeness and compliance with the contract requirements. Subject to IB 24.8, if minor item(s) appear to be excluded, or if any Bidder has not quoted price against any particular item or kept blank in price column (the same is considered as missing item), the price adjustment shall be based on the highest price offered for the same item among all responsive bidders. In case of non-availability of price from other Bidders, the price will be estimated by the Employer.
- (ii) In case there is a discrepancy between the quantity of an item quoted by the Bidder and the quantity specified in the bidding documents, the quantity specified in the bidding documents shall prevail, and the total cost will be corrected by multiplying the unit rate and quantity.

*Note: No price adjustment will be allowed if the major items are missing in the price schedules and the bid will be rejected. For this purpose, major item is defined as an item constituting 10% (calculated in accordance with this provision) of the quoted bid price.*

(II) Price Adjustment for Completion Schedule

Bids indicating completion in advance of the dates stated in Preamble to Conditions of Contract, no credit will be given in this evaluation.

Bids indicating completion period later than the period set out in Preamble to Conditions of Contract shall be adjusted in the evaluation by adding a factor of 0.05% of the Corrected Total Bid Price for each calendar day of completion later than specified period of the completion.

Bids indicating completion beyond **thirty (30) days** later than the dates set out in Preamble to Conditions of Contract, shall not be considered and rejected as non-responsive.

27A.4 The Employer's evaluation of a Bid will exclude and not take into account,

- (a) in the case of Plant and Mandatory Spare Parts (Schedule No. 1) supplied from abroad, all indirect taxes and duties, applicable in the Employer's country and payable on the Plant and Mandatory Spare Parts if the Contract is awarded to the Bidder; and

(Note:- The above-mentioned taxes and duties will be taken into account in case of application of landed cost).

- (b) in the case of Plant and Mandatory Spare Parts (Schedule No. 2) supplied from within the Employer's country, sales and other indirect taxes, applicable in the Employer's country and payable on the Plant and Mandatory Spare Parts if the Contract is awarded to the Bidder.

(Note:- The above mentioned taxes will be taken into account in case of application of landed cost).

- (c) in the case of Design Services (Schedule No, 3), Civil Works (Schedule No. 4 (a)) and Installation and Other Services (Schedule No. 4 (b)), all indirect taxes including PST, applicable in Employer's country.

27A.5 If price adjustment is allowed in accordance with IB 11.5, the estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in bid evaluation.

27A.6 If the bid of the successful bidder is seriously unbalanced in relation to the Employer's estimate of the cost of work to be performed under the Contract, the Employer may require the bidder to produce detailed price analysis for any or all items of the Schedule of Prices to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, the Employer may require that the amount of the Performance Security set forth in Clause IB.34 be increased at the expense of the successful bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful bidder under the Contract.

#### **IB.28 Process to be Confidential**

28.1 Subject to Clause 23 heretofore, no Bidder shall contact Employer and/or Engineer on any matter relating to its Bid from the time of the Bid opening to the time the bid evaluation result is announced by the Employer. The evaluation result shall be announced at least ten (10) days prior to award of Contract. The announcement to all bidders will include table(s) comprising read out prices, discounted prices, price adjustments made, final evaluated prices and recommendations against all the bids evaluated.

28.2 Any effort by a Bidder to influence Employer and/or Engineer in the Bid evaluation, Bid comparison or Contract Award decisions may result in the rejection of his Bid.

28.3 Mechanism for redressal of grievances shall be in accordance with PPRA rule No. 48.

### **F. AWARD OF CONTRACT**

#### **IB.29. Post-Qualification**

- 29.1 The Employer, at any stage of the bid evaluation, having credible reasons for or *prima facie* evidence of any defect in supplier's or contractor's capacities, may require the suppliers or contractors to provide information concerning their professional, technical, financial, legal or managerial competence whether already pre-qualified or not:

Provided that such qualification shall only be laid down after recording reasons therefore in writing. They shall form part of the records of that bid evaluation report.

- 29.2 The determination will take into account the bidder's financial, technical and production capabilities. It will be based upon an examination of the documentary evidence of the bidder's qualification submitted under Appendix B to Instructions to Bidders "Evidence of Bidder's & Subcontractor's Capability" by the bidder pursuant to Clause IB.13, as well as such other information as required under the Bidding Documents.
- 29.3 An affirmative determination will be a pre-requisite for award of the Contract to the lowest evaluated bidder. A negative determination will result in rejection of that bidder's bid in which event, Employer will proceed to undertake a similar determination of the next lowest evaluated bidder's capabilities to perform the Contract satisfactorily.

### **IB.30 Award Criteria**

- 30.1 Subject to Clause IB.32, the Employer will award the Contract to the bidder whose bid has been determined to be substantially responsive to the Bidding Documents and who has offered the lowest evaluated Bid Price, provided that such bidder has been determined to be qualified to satisfactorily perform the Contract in accordance with the provisions of Clauses IB.24 to 27A and IB 29.

### **IB.31 Employer's Right to Vary Quantities**

- 31.1 Employer reserves the right at the time of award of Contract to increase or decrease by upto 15% the quantity of goods and services specified in the Schedule of Prices without any change in the unit price or other terms and conditions.

### **IB.32 Employer's Right to Accept any Bid and to Reject any or all Bids**

- 32.1 Notwithstanding Clause IB.30, the Employer reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids, at any time prior to award of Contract, without thereby incurring any liability to the affected bidders or any obligation to inform the affected bidders of the grounds for the Employer's action except that the grounds for its rejection shall upon request be communicated, to any bidder who submitted a bid, without

justification of grounds. Rejection of all bids shall be notified to all bidders promptly.

- 32.2 No negotiations with the bidder having been evaluated as lowest responsive or any other bidder shall be permitted. However, the Employer may have clarification meeting(s) to get clarify any item(s) in the bid evaluation report.

### **IB.33 Notification of Award**

- 33.1 Prior to expiration of the period of bid validity prescribed by the Employer, the Employer will notify the successful bidder in writing ("Letter of Acceptance") that his bid has been accepted. This letter shall name the sum which the Employer will pay the Contractor in consideration of the execution and completion of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Conditions of Contract called the "Contract Price").
- 33.2 The Letter of Acceptance and its acceptance by the bidder will constitute the formation of the Contract, binding the Employer and the Bidder till signing of the formal Contract Agreement.
- 33.3 Upon furnishing by the successful bidder of a Performance Security, the Employer will promptly notify the other bidders that their bids have been unsuccessful and return their bid securities.

### **IB.34 Performance Security**

- 34.1 The successful bidder shall furnish to the Employer a Performance Security in the form and the amount stipulated in the Conditions of Contract within a period of twenty-eight(28) days after the receipt of Letter of Acceptance.
- 34.2 Failure of the successful bidder to comply with the requirements of Sub-Clause IB.34.1 or Clause IB.35 or Clause IB.44 shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security.

### **IB.35 Signing of Contract Agreement**

- 35.1 Within fourteen (14) days from the date of furnishing of acceptable Performance Security under the Conditions of Contract, the Employer will send to the successful bidder the Form of Contract Agreement provided in the Bidding Documents, duly filled in and incorporating all agreements between the parties for signing and return it to the Employer.
- 35.2 The formal Agreement between the Employer and the successful bidder shall be executed within fourteen (14) days of the receipt of such Form of Contract Agreement by the successful bidder from the Employer.

## **G. ADDITIONAL INSTRUCTIONS**

**IB.36 Instructions not Part of Contract**

- 36.1 Bids shall be prepared and submitted in accordance with the above Instructions to Bidders including Additional Instructions which are provided to assist Bidders in preparing their Bids, and do not constitute part of the Bid or the Contract Documents.

**IB.37 Contract Documents**

- 37.1 The Documents which will be included in the Contract are listed in the Form of Contract Agreement set out in these Bidding Documents.

**IB.38 Sufficiency of Bid**

- 38.1 Each bidder shall satisfy himself before Bidding as to the correctness and sufficiency of his Bid and of the rates and prices entered in the Schedule of Prices. Except insofar as it is otherwise expressly provided in the Contract, the rates and prices entered in the Schedule of Prices shall cover all his obligations under the Contract and all matters and things necessary for the proper completion of the Works.

**IB.39 One Bid per Bidder**

- 39.1 Each bidder shall submit only one bid either by himself, or as a partner in a joint venture. A bidder who submits or participates in more than one bid (other than alternatives pursuant to Clause IB.41) will be disqualified and bids submitted by him shall not be considered for evaluation and award.

Two or more firms partially or wholly owned or directed by common individuals, regardless of the extent of their shares or interest with each other shall not be eligible to bid or compete for the same tender. Only one such firm shall be eligible to bid for a tender. However, such firms may form a joint venture to bid as one venture.

**IB.40 Bidder to Inform Himself**

- 40.1 The bidder is advised to obtain for himself at his own cost and responsibility all information that may be necessary for preparing the bid and entering into a Contract for execution of the Works. This shall include but not be limited to the following:

- a. inquiries on Pakistani Income Tax/Sales Tax to the Commissioner of the Income Tax and Sales Tax, in Pakistan.
- b. inquiries on customs duties and other import taxes, to the concerned authorities of Customs and Excise Department.
- c. information regarding port clearance facilities, loading and

unloading facilities, storage facilities, transportation facilities and congestion at Pakistan seaports.

- d. investigations regarding transport conditions and the probable conditions which will exist at the time the Goods will be actually transported.

#### **IB.41 Alternate Proposals by Bidder**

Not Applicable

#### **IB.42 Local Conditions**

- 42.1 Bidder must verify and supplement by his own investigations the information about site and local conditions. However, Employer will assist the Bidder wherever practicable and possible.
- 42.2 All Bidders are required to visit the site at their own expense to review the areas allocated for the Plant and the interfacing facilities, if any. Bidders may also wish to study local conditions, available facilities, communications, craft wages, roads and other transport facilities. Bidders shall also acquaint themselves with the relevant laws, rules, and regulations of Pakistan.
- 42.3 The Bidders and any of their personnel or agents will be granted permission by the Employer to enter upon his premises and lands for the purpose of such inspection, but only upon the express condition that the Bidders, their personnel and agents, will release and indemnify the Employer, his personnel and agents from and against all liability in respect thereof and will be responsible for death or personal injury, loss of or damage to property and any other loss, damage, costs and expenses incurred as a result of such inspection.

#### **IB.43 Pre-Bid Meeting**

- 43.1 The Purchaser may, on his own motion or at the request of any prospective Bidder(s), hold a pre-bid meeting to clarify issues and to answer any questions on matters related to the Bidding Documents.

Pre-bid meeting will be held as per the following schedule:

Date: **16-09-2026**

Venue: Director General (Procurement), NGC

8<sup>th</sup> Floor, Shaheen Complex, Egerton Road, Lahore, Pakistan

All prospective Bidders or their authorized representatives are invited to attend the pre-bid meeting.

- 43.2 The Bidders are requested to submit questions, if any, in writing so as to reach the Purchaser not later than seven (7) days before the proposed pre-bid meeting.
- 43.3 Minutes of the pre-bid meeting, including the text of the questions raised and the replies given, will be communicated via publishing on NGC's website and

on e-PADS. Any modification of the Bidding Documents listed in IB 7.1 hereof which may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to Clause IB.7 and not through the minutes of the pre bid meeting.

- 43.3 Absence at the pre-bid meeting will not be a cause for disqualification of a Bidder.

#### **IB.44 Integrity Pact**

The Bidder shall sign and stamp the Integrity Pact provided at Schedule-J to Bid in the Bidding Document for all Federal Government procurement contracts exceeding Rupees ten million. Failure to provide such Integrity Pact shall make the bid non-responsive.

#### **IB.45 General Performance of the Bidders**

- 45.1 The Employer reserves the right to obtain information regarding performance of the Bidders on their previously awarded contracts/works. The Employer may in case of consistent poor performance of any Bidder as reported by the employers of the previously awarded contracts, inter-alia, reject his bid and/or refer the case to the Pakistan Engineering Council. Upon such reference, PEC in accordance with its rules, procedures and relevant laws of the land take such action as may be deemed appropriate under the circumstances of the case including black listing of such Bidder and debarring him from participation in future bidding for similar works.

### **IB 46 GRIEVANCE REDRESSAL & COMPLAINT REVIEW MECHANISM**

- 46.1. Any party can file its written complaint against the eligibility parameters or any other terms and conditions prescribed in the prequalification or bidding documents found contrary to provision of Procurement Regulatory Framework, and the same shall be addressed by the GRC well before the bid submission deadline.
- 46.2. Any Bidder feeling aggrieved by any act of the procuring agency after the submission of his bid may lodge a written complaint concerning his grievances not later than seven days of the announcement of technical evaluation report and five days after issuance of final evaluation report.
- 46.3. In case, the complaint is filed against the technical evaluation report, the GRC shall suspend the procurement proceedings.

- 46.4. In case, the complaint is filed after the issuance of the final evaluation report, the complainant cannot raise any objection on technical evaluation of the report:

Provided that the complainant may raise the objection on any part of the final evaluation report in case where single stage one envelope bidding procedure is adopted.

- 46.5. The GRC, in both the cases shall investigate and decide upon the complaint within ten days of its receipt.
- 46.6. Any bidder or the procuring agency not satisfied with the decision of the GRC may file Appeal before the Appellate Committee of the Authority on prescribed format after depositing the Prescribed fee.
- 46.7. The Committee, upon receipt of the Appeal against the decision of the GRC complete in all respect shall serve notices in writing upon all the parties to Appeal.
- 46.8. The committee shall call the record from the concerned procuring agency or the GRC as the case may be, and the same shall be provided within prescribed time.
- 46.9. The committee may after examination of the relevant record and hearing all the concerned parties, shall decide the complaint within fifteen (15) days of receipt of the Appeal.
- 46.10. The decision of the Committee shall be in writing and shall be signed by the Head and each Member of the Committee. The decision of the committee shall be final.

**IB 47****Mechanism of Blacklisting**

- 47.1. The Procuring Agency shall bar for not more than the time prescribed in Rule-19 of the Public Procurement Rules, 2004, from participating in their respective procurement proceedings, bidder or contractor who either:
- i. Involved in corrupt and fraudulent practices as defined in Rule-2 of Public Procurement Rules;
  - ii. Fails to perform his contractual obligations;
  - iii. Fails to abide by the its securing declaration; and
  - iv. Submits false information (or) hides information on Beneficial Ownership Declaration Performa under S.R.O 592(I)/2022.
- 47.2. The show cause notice shall contain: (a) precise allegation, against the bidder or contractor; (b) the maximum period for which the Procuring Agency proposes to debar the bidder or contractor from participating in any public procurement of the Procuring Agency;



- and (c) the statement, if needed, about the intention of the Procuring Agency to make a request to the Authority for debarring the bidder or contractor from participating in public procurements of all the procuring agencies.
- 47.3. The procuring agency shall give minimum of seven days to the bidder or contractor for submission of written reply of the show cause notice
- 47.4. In case, the bidder or contractor fails to submit written reply within the requisite time, the Procuring Agency may issue notice for personal hearing to the bidder or contractor/ authorize representative of the bidder or contractor and the procuring agency shall decide the matter on the basis of available record and personal hearing, if availed.
- 47.5. In case the bidder or contractor submits written reply of the show cause notice, the Procuring Agency may decide to file the matter or direct issuance of a notice to the bidder or contractor for personal hearing.
- 47.6. The Procuring Agency shall give minimum of seven days to the bidder or contractor for appearance before the specified officer of the Procuring Agency for personal hearing. The specified officer shall decide the matter on the basis of the available record and personal hearing of the bidder or contractor, if availed
- 47.7. The procuring Agency shall decide the matter within fifteen days from the date of personal hearing unless the personal hearing is adjourned to a next date and in such an eventuality, the period of personal hearing shall be reckoned from the last date of personal hearing.
- 47.8. The Procuring Agency shall communicate to the bidder or contractor the order of debarring the bidder or contractor from participating in any public procurement with a statement that the bidder or contractor may, within thirty days, prefer a representation against the order before the Authority.
- 47.9. Such blacklisting or barring action shall be communicated by the procuring agency to the Authority and respective bidder or bidders in the form of decision containing the grounds for such action. The same shall be publicized by the Authority after examining the record whether the procedure defined in blacklisting and debarment mechanism has been adhered to by the procuring agency.

- 47.10. The bidder may file the review petition before the Review Petition Committee Authority within thirty days of communication of such blacklisting or barring action after depositing the prescribed fee and in accordance with "Procedure of filing and disposal of review petition under Rule-19(3) Regulations, 2021". The Committee shall evaluate the case and decide within ninety days of filing of review petition
- 47.11. The committee shall serve a notice in writing upon all respondent of the review petition. The notices shall be accompanied by the copies of review petition and all attached documents of the review petition including the decision of the procuring agency. The parties may file written statements along with essential documents in support of their contentions. The Committee may pass such order on the representation may deem fit.
- 47.12. The Authority on the basis of decision made by the committee either may debar a bidder or contractor from participating in any public procurement process of all or some of the procuring agencies for such period as the deemed appropriate or acquit the bidder from the allegations. The decision of the Authority shall be final.

## **(H) APPENDICES**

The Appendices to ITB are as given below:

- Appendix-A: Name of Eligible Countries
- Appendix-B: Evidence of Bidder's Capabilities
- Appendix-C: Domestic Goods (value added in Pakistan)
- Appendix-D: Comfort Letter
- Appendix-E: Form of Bid Security

Appendices are given herein below:

**Appendix A to  
Instructions to Bidders**

**NAME OF ELIGIBLE COUNTRIES**

All countries of the World with whom Islamic Republic of Pakistan has commercial / trade relations except India, Israel and the countries upon which international sanctions are imposed.

**Appendix B to  
Instructions to Bidders**

**EVIDENCE OF BIDDER'S & SUBCONTRACTOR'S CAPABILITY**

[Note: Bidders to fill following forms to provide information regarding its eligibility and capability]

**Form ELI – 1: Bidder's Information Sheet**

| <b>Bidder's Information</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>Bidder's legal name</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |
| <b>In case of a Joint Venture,<br/>legal name of each partner</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |
| <b>Bidder's country of<br/>constitution</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
| <b>Bidder's year of constitution</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| <b>Bidder's legal address in<br/>country of constitution</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| <b>Bidder's authorized<br/>representative</b><br>(name, address, telephone<br>number(s), fax number(s), e-<br>mail address)                                                                                                                                                                                                                                                                                                                                                                                       |  |
| <b>Attached are copies of the following documents:.</b><br><input type="checkbox"/> 1. In case of a single entity, articles of incorporation or constitution of the legal entity named above, in accordance with IB 4.1<br><input type="checkbox"/> 2. Authorization to represent the firm or Joint Venture named above, in accordance with IB 17.4<br><input type="checkbox"/> 3. In case of a Joint Venture, a letter of intent to form a Joint Venture or Joint Venture agreement, in accordance with IB 13.5. |  |

**Form ELI – 2: Joint Venture Information Sheet**

Each member of the Joint Venture must fill out this form separately. Subcontractor must also fill out this form.

| <b>Joint Venture/Subcontractor Information</b>                                                                                                                                                                                                                                                        |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>Bidder's legal name</b>                                                                                                                                                                                                                                                                            |  |
| <b>Joint Venture Partner's or Subcontractor's legal name</b>                                                                                                                                                                                                                                          |  |
| <b>Joint Venture Partner's or Subcontractor's country of constitution</b>                                                                                                                                                                                                                             |  |
| <b>Joint Venture Partner's or Subcontractor's year of constitution</b>                                                                                                                                                                                                                                |  |
| <b>Joint Venture Partner's or Subcontractor's legal address in country of constitution</b>                                                                                                                                                                                                            |  |
| <b>Joint Venture Partner's or Subcontractor's authorized representative information</b><br>(name, address, telephone number(s), fax number(s), e-mail address)                                                                                                                                        |  |
| <b>Attached are copies of the following documents:</b><br><input type="checkbox"/> 1. Articles of incorporation or constitution of the legal entity named above, in accordance with IB 2.1<br><input type="checkbox"/> 2. Authorization to represent the firm named above, in accordance with IB 17.4 |  |

**Form FIN – 1: Historical Financial Performance**

Each Bidder must fill out this form.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name below:

Joint Venture Partner: \_\_\_\_\_

| Financial Data for Previous 5 Years [\$ Equivalent]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |         |         |         |         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|---------|---------|---------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Year 1: | Year 2: | Year 3: | Year 4: | Year 5: |
| <b>Information from Balance Sheet</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |         |         |         |         |
| <b>Total Assets (TA)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |         |         |         |         |
| <b>Total Liabilities (TL)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |         |         |         |         |         |
| <b>Net Worth = TA - TL</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |         |         |         |         |
| <b>Current Assets (CA)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |         |         |         |         |
| <b>Current Liabilities (CL)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |         |         |         |         |
| <b>Information from Income Statement</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |         |         |         |         |
| <b>Total Revenues</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |         |         |         |         |
| <b>Profits Before Taxes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         |         |         |         |         |
| <b>Profits After Taxes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |         |         |         |         |
| <input type="checkbox"/> Attached are copies of financial statements (balance sheets including all related notes, and income statements) for the last 5 years, as indicated above, complying with the following conditions. <ul style="list-style-type: none"> <li>All such documents reflect the financial situation of the legal entity or entities comprising the Bidder and not the Bidder's parent companies, subsidiaries or affiliates.</li> <li>Historical financial statements must be audited by a certified accountant.</li> <li>Historical financial statements must be complete, including all notes to the financial statements.</li> <li>Historical financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted).</li> </ul> |         |         |         |         |         |

**Form FIN – 2: Average Annual Turnover**

Each Bidder must fill out this form.

The information supplied should be the Annual Turnover of the Bidder or each member of a Joint Venture in terms of the amounts billed to clients for each year for work in progress or completed, converted to US dollars as specified in Clause ITB-13.4(d).

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner’s name below:

Joint Venture Partner: \_\_\_\_\_

| Annual Turnover Data for the Last 5 Years |                    |                  |                  |
|-------------------------------------------|--------------------|------------------|------------------|
| Year                                      | Amount<br>Currency | Exchange<br>Rate | \$<br>Equivalent |
|                                           |                    |                  |                  |
|                                           |                    |                  |                  |
|                                           |                    |                  |                  |
| Average Annual Turnover                   |                    |                  |                  |



**Form FIN – 3: Availability of Financial Resources**

Bidders shall specify proposed sources of financing, such as liquid assets, lines of credit and other financial means to meet the Bidder's financial requirements for

- (a) its current contract commitments calculated on three (03) months basis, and
- (b) the subject contract.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name below:

Joint Venture Partner: \_\_\_\_\_

| Financial Resources                 |                           |                        |
|-------------------------------------|---------------------------|------------------------|
| No.                                 | Source of financing       | Amount (\$ equivalent) |
| 1                                   | Liquid Assets             |                        |
| 2                                   | Credit Line <sup>a</sup>  |                        |
| 3                                   | Other Financial Resources |                        |
| Total Available Financial Resources |                           |                        |

<sup>a</sup> To be substantiated by a letter from the bank issuing the line of credit.

**Form FIN- 4: Financial Requirements for Current Contract Commitments**

Bidders (or each Joint Venture partner) should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name below:

Joint Venture Partner: \_\_\_\_\_

| <b>Current Contract Commitments</b>                                  |                  |                                           |                                          |                          |                                                |                                                         |                                                  |
|----------------------------------------------------------------------|------------------|-------------------------------------------|------------------------------------------|--------------------------|------------------------------------------------|---------------------------------------------------------|--------------------------------------------------|
| No.                                                                  | Name of Contract | Employer's Contact<br>(Address, Tel, Fax) | Total Contract Value<br>(Equivalent USD) | Contract Completion Date | Outstanding Contract Value<br>(X) <sup>a</sup> | Remaining Contract Period<br>in months (Y) <sup>b</sup> | Monthly Financial Resources Requirement<br>(X/Y) |
| 1                                                                    |                  |                                           |                                          |                          |                                                |                                                         |                                                  |
| 2                                                                    |                  |                                           |                                          |                          |                                                |                                                         |                                                  |
| 3                                                                    |                  |                                           |                                          |                          |                                                |                                                         |                                                  |
| 4                                                                    |                  |                                           |                                          |                          |                                                |                                                         |                                                  |
| Total Monthly Financial Requirement for Current Contract Commitments |                  |                                           |                                          |                          |                                                |                                                         | \$ .....                                         |

<sup>a</sup> Remaining outstanding contract values to be calculated from 28 days prior to the bid submission deadline (\$ equivalent based on the foreign exchange rate as of the same date).

<sup>b</sup> Remaining contract period to be calculated from 28 days prior to bid submission deadline.

<sup>c</sup> The monthly commitments calculated from above table will be multiplied with a factor (proposed "3" ) to calculated the total commitments for 03 months.

**Form: Credit Line****BANK CERTIFICATE**

This is to certify that M/s..... is a reputed company with a good financial standing.

If the contract for namely ..... (name of IFB) is awarded to the above firm, we shall be able to provide overdraft/credit facilities to the extent of PKR/US\$..... to meet their financial resources requirements for executing the above contract.

Signature of Senior Bank Manager: \_\_\_\_\_

Name of the Senior Bank Manager: \_\_\_\_\_

Address of the Bank: \_\_\_\_\_

Stamp of the Bank

Note: Certificate should be on the letter head of the bank.

▪ **Change the text as follows for Joint Venture:**

This is to certify that M/s..... who has formed a JV with M/s.....and M/s..... for participating in this bid, is a reputed company with a good financial standing.

If the contract for namely ..... (name of IFB) is awarded to the above Joint Venture, we shall be able to provide overdraft/credit facilities to the extent of PKR/US\$.....to M/s..... to meet the financial resources requirement for executing the above contract.

[This should be given by each of the JV members in proportion to their financial participation.]

**Form EXP - 1: Contracts of Similar Size and Nature**

Fill out one (1) form per contract.

| Contract of Similar Size and Nature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                           |                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-----------------|
| Contract No. . . . . of . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Contract Identification                                                                                                   |                 |
| Award Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                           | Completion Date |
| Role in Contract                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor |                 |
| Total Contract Amount                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | \$                                                                                                                        |                 |
| If partner in a Joint Venture or subcontractor, specify participation of total contract amount                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Percent of Total                                                                                                          | Amount          |
| Employer's name<br>Address<br>Telephone number<br>Fax number<br>E-mail                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                           |                 |
| Description of the Similarity in Accordance with IB 13.4 (a)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                           |                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                           |                 |
| <input type="checkbox"/> Attached are copies of: <ul style="list-style-type: none"> <li>● Contract agreements with sufficient details to establish bidder's experience in accordance with IB 13.4,</li> <li>● Joint Venture Agreements (applicable if contract performed in joint venture) with sufficient detail of bidder's participation.</li> <li>● Verifiable End User Certificates establishing successful operation of contracts for the period mentioned in IB 13.4 on end user's proper letter head showing email address, telephone no., fax no., postal address, etc.</li> </ul> <p>➤ Notarized English translation shall also be attached if any document is not in English language.</p> <p>➤ All documents shall reflect experience of the legal entity or entities comprising the Bidder and not the Bidder's parent companies, subsidiaries or affiliates.</p> |                                                                                                                           |                 |

**Form EXP – 2: Experience in Key Activities**

Fill out one (1) form per contract.

| <b>Contract with Similar Key Activities</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                           |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|--------|
| Contract No. .... of ....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Contract Identification                                                                                                   |        |
| Award Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Completion Date                                                                                                           |        |
| Role in Contract                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor |        |
| Total Contract Amount                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | \$                                                                                                                        |        |
| If partner in a Joint Venture or subcontractor, specify participation of total contract amount                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Percent of Total                                                                                                          | Amount |
| Employer's name<br>Address<br>Telephone number<br>Fax number<br>E-mail                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                           |        |
| <b>Description of the Key Activities in Accordance with IB 13.4 (b)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                           |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                           |        |
| <input type="checkbox"/> Attached are copies of: <ul style="list-style-type: none"> <li>Contract agreements with sufficient details to establish bidder's experience in accordance with IB 13.4,</li> <li>Joint Venture Agreements (applicable if contract performed in joint venture) with sufficient detail of bidder's participation.</li> <li>End User Certificates establishing successful operation of contracts for the period mentioned in IB 13.4.</li> </ul> <p>➤ Notarized English translation shall also be attached if any document is not in English language.</p> <p>➤ All documents shall reflect experience of the legal entity or entities comprising the Bidder and not the Bidder's parent companies, subsidiaries or affiliates.</p> |                                                                                                                           |        |

**Form EXP – 3: Experience of Subcontractors/ Manufacturers**

Fill out one (1) form per contract.

| Contract for the Major Items                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                           |                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-----------------|
| Contract No . . . . . of . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Contract Identification                                                                                                   |                 |
| Award Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                           | Completion Date |
| Role in Contract                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <input type="checkbox"/> Contractor <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor |                 |
| Total Contract Amount                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | \$                                                                                                                        |                 |
| If partner in a Joint Venture or subcontractor, specify participation of total contract amount                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Percent of Total                                                                                                          | Amount          |
| Employer's name<br>Address<br>Telephone number<br>Fax number<br>E-mail                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                           |                 |
| Description of the Major Items in Accordance with sub-clause IB 14.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                           |                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                           |                 |
| <p>In case of manufacturers, please attach:</p> <ul style="list-style-type: none"> <li>• Copies of relevant supply record, contract agreements, Inspection certificates/ Bill of Lading etc. to prove experience and supply.</li> <li>• Manufacturer's Authorization</li> <li>• One satisfactory Operational Certificate from end user from Pakistan or outside the country of origin of offered equipment/goods. The submitted certificate must indicate the name of the end user/client along with its contact address, phone numbers, fax numbers, web-site and e-mail addresses.</li> <li>• If bidder has supplied equipment to NGC which is in satisfactory operation for one year, it shall be considered equivalent to above requirement.</li> </ul> <p>In case of Subcontractors of Key activities, please attach:</p> <ul style="list-style-type: none"> <li>• Contract agreements with sufficient details to establish bidder's experience in accordance with IB 13.4,</li> <li>• Joint Venture Agreements (applicable if contract performed in joint venture) with sufficient detail of bidder's participation.</li> <li>• End User Certificates establishing successful operation of contracts for the period mentioned in IB 13.4.</li> </ul> <p>➤ Notarized English translation shall also be attached if any document is not in English language.</p> <p>➤ All documents shall reflect experience of the legal entity or entities comprising the Bidder and not the Bidder's parent companies, subsidiaries or affiliates.</p> |                                                                                                                           |                 |

**Note:**

1. No change of Sub-Contractor shall be made by the Bidder without prior approval of the Employer.
2. The truthfulness and accuracy of the statement as to the experience of Subcontractors is guaranteed by the Bidder. The Employer's judgment shall be final as to the evaluation of the experience of Subcontractors submitted by the Bidder.
3. Statement of similar works shall include description, location & value of work, year completed and name & address of the clients.
4. This may include manufacturer(s) who are proposed here and their relevant details to be provided accordingly including make, capacity and salient features to make it particularly suitable for the works. The technology used should also be detailed adequately.

Initials of Signatory to Bid:.....

## Appendix C to Instructions to Bidders

### Domestic Goods (Value added in Pakistan)

[Bidders claiming eligibility for domestic preference should fill in for supply items only, all columns hereunder and provide necessary documentation to substantiate their claim]

| Sr. No.                | Description of Indigenous Goods | Unit | Qty | Total Price of Goods Ex-Factory (Pak Rs.) | Domestic value added in the manufacturing cost as percentage of Ex-Factory Price | Amount of value addition (Pak Rs.) |
|------------------------|---------------------------------|------|-----|-------------------------------------------|----------------------------------------------------------------------------------|------------------------------------|
| 1                      | 2                               | 3    | 4   | 5                                         | 6                                                                                | 7                                  |
|                        |                                 |      |     |                                           |                                                                                  |                                    |
| Total in columns 5 & 7 |                                 |      |     |                                           |                                                                                  |                                    |

### Computations:

- |                                                            |             |
|------------------------------------------------------------|-------------|
| A. Total amount of Value Addition (from Col.7)             | Rs_____     |
| B. Total Ex-Factory Price of Indigenous Goods (from Col.5) | Rs_____     |
| C. Total DDP Price of imported supply items                | Eqv.Rs_____ |
| D. Total Price of supply items [B+C]                       | Eqv.Rs_____ |
| E. % of value addition = [(A/D)×100]                       | _____%      |
| F. Domestic Preference =(15,20 or 25)% of B                | Rs_____     |

Note-I: The above factors for value addition shall be substantiated with Certificate issued by Engineering Development Board (EDB) Pakistan.

Note-II: The indigenously produced goods for which domestic preference has been claimed and thereby granted, cannot be replaced with goods of foreign origin after award of contract.



**Appendix D to****Instructions to Bidders****COMFORT LETTER**

Bid for Contract No. \_\_\_\_\_: \_\_\_\_\_ [Title of Contract]

To:

(Insert Employer Name)

Gentleman,

- i. This is to certify that if the subject EPC Contract is awarded to M/s \_\_\_\_\_ incorporated under the laws of \_\_\_\_\_ [insert name of country] we are able as well as willing to provide / extend unconditional banking facilities including but not limited to opening of letter of credit or making payment through direct payment procedure, retirement of shipping documents, issuance of Electronic Import Form (EIF) for custom clearance purposes etc.
- ii. We understand that the issuance of this letter does not create any obligation for NGC.

Signature of Senior Bank Manager: \_\_\_\_\_

Name of the Senior Bank Manager: \_\_\_\_\_

Address of the Bank: \_\_\_\_\_

Stamp of the Bank

• **Change the text under para (i) as follows in case of Joint Venture**

M/s \_\_\_\_\_ incorporated under the laws of \_\_\_\_\_ [insert name of country] has formed a JV with M/s \_\_\_\_\_ and M/s \_\_\_\_\_ for participating in this bid.

- i. This is to certify that if the subject Contract is awarded to the above Joint Venture, we are able as well as willing to provide / extend banking facilities including but not limited to opening of letter of credit, making payment through direct payment procedure, retirement of shipping documents, issuance of Electronic Import Form (EIF) for custom clearance purposes etc.
- ii. We understand that the issuance of this letter does not create any obligation for NGC.  
[This should be given by each of the JV members]

Note: Certificate should be on the letter head of the Scheduled Bank in Pakistan.

*[Note: The requirement of "Comfort Letter" has been included purely for payment purposes to ensure the availability of banking channels for smooth execution of Contract. The "Comfort Letter" is neither a Bank Guarantee nor is required to determine financial soundness of the Bidder, and does not create any legal obligation to bank, but rather is a simple confirmation on bank's letter head that in case of award of Contracts to specific firm, the banking channels will be available for making payment by NGC in favor of Supplier.]*

*Moreover, a Bank can provide confirmation in its own wording without changing the substance of letter i.e., assuring to provide banking channel if given business]*

**Appendix E to  
Instructions to Bidders**

**Form of Bid Security**  
(Bank Guarantee)

Guarantee No. \_\_\_\_\_  
Executed on \_\_\_\_\_  
Expiry date \_\_\_\_\_

[Letter by the Guarantor to the Employer]

Name of Guarantor (Bank) with address: \_\_\_\_\_

Name of Principal (Bidder) with address: \_\_\_\_\_

Penal Sum of Security (express in words and figures): \_\_\_\_\_

Bid Reference No. \_\_\_\_\_ Date of Bid Opening \_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bid and at the request of the said Principal, we the Guarantor above-named are held and firmly bound unto the **Chief Engineer (MP&M) NTDC**, (hereinafter called The "Employer") in the sum stated above, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the accompanying Bid numbered and dated as above for \_\_\_\_\_ (Particulars of Bid) to the said Employer; and

WHEREAS, the Employer has required as a condition for considering the said Bid that the Principal furnishes a Bid Security in the above said sum to the Employer, conditioned as under:

- (1) that the Bid Security shall remain valid for a period 28 days beyond the period of validity of the Bid;
- (2) that in the event of;
  - (a) the Principal withdraws his Bid during the period of validity of Bid, or
  - (b) the Principal does not accept the correction of his Bid Price, pursuant to Sub-Clause 26.2 of Instructions to Bidders, or
  - (c) the bidder is involved in Corrupt and/or fraudulent practices, or
  - (d) failure of the successful bidder to
    - (i) furnish the required Performance Security, in accordance with Clause 34 of Instructions to Bidders, or
    - (ii) sign the proposed Contract Agreement, in accordance with

## Clause 35 of Instructions to Bidders,

then the entire sum be paid immediately to the said Employer as liquidated damages and not as penalty for the successful bidder's failure to perform.

NOW THEREFORE, if the successful bidder shall, within the period specified therefor, on the prescribed form presented to him for signature enter into a formal Contract with the said Employer in accordance with his Bid as accepted and furnish within twenty eight (28) days of his being requested to do so, a Performance Security with good and sufficient surety, as may be required, upon the form prescribed by the said Employer for the faithful performance and proper fulfilment of the said Contract or in the event of non-withdrawal of the said Bid within the time specified for its validity then this obligation shall be void and of no effect, but otherwise to remain in full force and effect.

PROVIDED THAT the Guarantor shall forthwith pay to the Employer the said sum stated above upon first written demand of the Employer without cavil or argument and without requiring the Employer to prove or to show grounds or reasons for such demand notice of which shall be sent by the Employer by registered post duly addressed to the Guarantor at its address given above.

PROVIDED ALSO THAT the Employer shall be the sole and final judge for deciding whether the Principal has duly performed his obligations to sign the Contract Agreement and to furnish the requisite Performance Security within the time stated above, or has defaulted in fulfilling said requirements and the Guarantor shall pay without objection the sum stated above upon first written demand from the Employer forthwith and without any reference to the Principal or any other person.

IN WITNESS WHEREOF, the above bounden Guarantor has executed the instrument under its seal on the date indicated above, the name and seal of the Guarantor being hereto affixed and these presents duly signed by its undersigned representative pursuant to authority of its governing body.

\_\_\_\_\_  
Guarantor (Bank)

Witness:

Signature \_\_\_\_\_

e. Name \_\_\_\_\_

\_\_\_\_\_  
Corporate Secretary (Seal)

Title \_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_  
(Name, Title & Address)

\_\_\_\_\_  
Corporate Guarantor (Seal)

# **FORM OF TECHNICAL BID & SCHEDULES TO BID**

## LETTER OF TECHNICAL BID AND SCHEDULES TO BID

### Letter of Technical Bid

### Schedules to Bid

- Schedule A to Bid: Specific Plant Data (**Schedule of Technical data**)
- Schedule B to Bid: Proposed Organization for the Project & Work Methodology
  - Form 1: Site Organization & Method Statement
  - Form 2: Mobilization Schedule
- Schedule C to Bid: Construction Schedule
- Schedule D to Bid: Personnel
  - Form PER-1: Proposed Personnel
  - Form PER-2: Resume of Proposed Personnel
- Schedule E to Bid: Subcontractors
- Schedule F to Bid: Country of Origin Declaration Form
- Schedule G-1 to Bid: Deviations from Technical Provisions
- Schedule G-2 to Bid: Deviations from Contractual Conditions
- Schedule H To Bid: Specimen JV Agreement
- Schedule I To Bid: Equipment
- Schedule K to Bid: Undertaking Of Acceptance Of And Compliance With The SOP For Blacklisting Of Contractors
- Schedule L to Bid: Manufacturer's Authorization
- Schedule M to Bid: Undertaking For Type Test Of Equipment

**LETTER OF TECHNICAL BID**

Bid Reference No. \_\_\_\_\_

Package No. \_\_\_\_\_

---

(Name of Works)

To:

---

---

---

Gentlemen,

- f. Having examined the Bidding Documents including Instructions to Bidders, Conditions of Contract, Specifications, Drawings, Schedule of Prices and Addenda Nos. \_\_\_\_\_ for the execution of the above-named Works, we, the undersigned, being a company doing business under the name of \_\_\_\_\_ and address \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- and being duly incorporated under the laws of \_\_\_\_\_ hereby offer to execute and complete such Works and remedy any defects therein in conformity with the said Documents including Addenda thereto.
- g. We understand that all the Schedules attached hereto form part of this Bid.
- h. As security for due performance of the undertakings and obligations of this Bid, we submit herewith a Bid Security in the amount of ..... drawn in the favor of, or made payable to the Employer, ..... and valid for a period ..... days beyond the period of validity of Bid.
- i. We undertake that Price Schedules as per requirements of the Bidding Documents are enclosed with the Price Bid.
- j. We undertake, if our Bid is accepted, to commence the Works and to deliver and complete the whole of the Works comprised in the Contract within the time(s) stated in Preamble to the Conditions of Contract.
- k. We agree to abide by this Bid for the period of **180** days from the date fixed for receiving the same and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

7. Unless and until a formal Agreement is prepared and executed, this Bid, together with your written acceptance thereof, shall constitute a binding contract between us.
1. We undertake, if our Bid is accepted, to execute the Performance Security referred to in Clause 10 of Conditions of Contract for the due performance of the Contract.
9. We do hereby declare that the Bid is made without any collusion, comparison of figures or arrangement with any other person or persons making a Bid for the Works.
10. We do hereby declare that our firm, including any subcontractors or suppliers for any part of the Contract, have nationalities from eligible countries *[insert the nationality of the Bidder, including that of all parties that comprise the Bidder if the Bidder is a consortium or association, and the nationality of each Subcontractor and Supplier]*.
11. We, including any subcontractors or suppliers for any part of the Contract, do not have any conflict of interest.
12. We are not participating, as a Bidder, in more than one bid in this bidding process.
13. We confirm, if our Bid is accepted, that all partners of the joint venture shall be liable jointly and severally for the execution of the Contract and the composition or the constitution of the joint venture shall not be altered without the prior consent of the Employer. (Please delete in case of Bid from a single firm).

Dated this ..... day of ..... 20...

Signature ..... in the capacity of ..... Duly  
authorized to sign the Bid for and on behalf of

.....  
(Name of Bidder in Block Capitals)  
(Seal of Bidder)

Bidder's Address

.....  
.....  
.....

Witness:

Signature:

.....

Name: .....

Address:

.....  
.....  
.....

Occupation

.....



## **SCHEDULE - A TO BID**

### **SPECIFIC PLANT DATA (SCHEDULE OF TECHNICAL DATA)**

#### **GENERAL**

The bidder shall submit with the bid all the guaranteed characteristics, technical data/specific plant data and technical information specified herein, covering all material required by the Technical Provisions, all of which shall comply with the Bidding Documents and shall become a part thereof.

**SPECIFIC PLANT DATA FOR  
500kV TRANSMISSION LINE TOWERS**

| Sr. No. | Information Required                                                                                                                         | 'A'                                    | 'B' | 'C' |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-----|-----|
| 1.      | Origin of Steel<br>(Maker's Name & Address)                                                                                                  |                                        |     |     |
| 2.      | Origin of Towers<br>(Maker's Name & Address)                                                                                                 |                                        |     |     |
| 3.      | Origin of Nuts & Bolts<br>(Maker's Name & Address)                                                                                           |                                        |     |     |
| 4.      | Name and Address of Fabricators                                                                                                              |                                        |     |     |
| 5.      | Name and Address of Galvanizer                                                                                                               |                                        |     |     |
| 6.      | Steel as per ASTM 36 or Equivalent for Members other than Marked "H" for Tower types "DS1", "DA1", "DD1", "TDT", "SGM", "AGM", "DGM" & "TGM" |                                        |     |     |
|         | a) Grade                                                                                                                                     | 36                                     |     |     |
|         | b) Ultimate Tensile Stress, MPa                                                                                                              | 400 – 550                              |     |     |
|         | c) Minimum Guaranteed Yield Stress, MPa                                                                                                      | 250                                    |     |     |
|         | d) Minimum Elongation in gauge length of 200mm/50mm                                                                                          | 20% in 200mm<br>21% in 50mm            |     |     |
|         | e) Bend Ratio as per Clause 2.2.2 of Technical Provisions of the Bidding Documents                                                           | 1.5t                                   |     |     |
|         | f) Chemical Properties                                                                                                                       |                                        |     |     |
|         | - Carbon % ≤                                                                                                                                 | 0.26                                   |     |     |
|         | - Manganese % ≤                                                                                                                              | *                                      |     |     |
|         | - Phosphorus % ≤                                                                                                                             | 0.04                                   |     |     |
|         | - Sulfurs % ≤                                                                                                                                | 0.05                                   |     |     |
| 7.      | Steel as per ASTM A572 Gr.50 or equivalent for Members Marked "H" for Tower Type "SGM", "AGM", "DGM" & "TGM"                                 |                                        |     |     |
|         | a) Grade                                                                                                                                     | 50                                     |     |     |
|         | b) Ultimate Tensile Stress, MPa                                                                                                              | 450                                    |     |     |
|         | c) Minimum Guaranteed Yield Stress, MPa                                                                                                      | 345                                    |     |     |
|         | d) Minimum Elongation in gauge length of 200mm/50mm                                                                                          | 18% in 200mm<br>21% in 50mm            |     |     |
|         | e) Bend Ratio as per Clause 2.2.2 of Technical Provisions of the Bidding Documents                                                           | Up to 25mm 1.5t<br>&<br>Over 25mm 2.0t |     |     |
|         | f) Chemical Properties                                                                                                                       |                                        |     |     |
|         | - Carbon % ≤                                                                                                                                 | 0.23                                   |     |     |
|         | - Manganese % ≤                                                                                                                              | 1.35                                   |     |     |
|         | - Phosphorus % ≤                                                                                                                             | 0.04                                   |     |     |
|         | - Sulfurs % ≤                                                                                                                                | 0.05                                   |     |     |

|     |                                                                                                                                                                                      |                                                                     |  |  |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|--|--|
| 8.  | Steel as per EN10025, S355J2 for Members Marked “H” high strength or equivalent for Tower types “DS1”, “DA1”, “DD1” & “TDT”                                                          |                                                                     |  |  |
| a)  | Grade                                                                                                                                                                                | S355J2                                                              |  |  |
| b)  | Ultimate Tensile Stress, MPa                                                                                                                                                         | 470 – 630                                                           |  |  |
| c)  | Minimum Guaranteed Yield Stress, MPa                                                                                                                                                 | 355 for $t \leq 16\text{mm}$ &<br>345 for $16 < t \leq 40\text{mm}$ |  |  |
| d)  | Minimum Elongation in gauge length of 200mm/50mm                                                                                                                                     | 23% in<br>$L_0 = 5.65\sqrt{S_0}$                                    |  |  |
| e)  | Bend Ratio as per Clause 2.2.2 of Technical Provisions of the Bidding Documents                                                                                                      | Up to 25mm 1.5t<br>&<br>Over 25mm 2.0t                              |  |  |
| f)  | Chemical Properties                                                                                                                                                                  |                                                                     |  |  |
| -   | Carbon % $\leq$                                                                                                                                                                      | 0.23                                                                |  |  |
| -   | Manganese % $\leq$                                                                                                                                                                   | 1.7                                                                 |  |  |
| -   | Phosphorus % $\leq$                                                                                                                                                                  | 0.035                                                               |  |  |
| -   | Sulfurs % $\leq$                                                                                                                                                                     | 0.035                                                               |  |  |
| 9.  | Steel as per ASTM A572 Gr.60 or equivalent for Members Marked “HH” for Tower Type “DS1”, “DA1”, “DD1” & “TDT” and for Members Marked “EH” for Tower Type “SGM”, “AGM”, “DGM” & “TGM” |                                                                     |  |  |
| a)  | Grade                                                                                                                                                                                | 60                                                                  |  |  |
| b)  | Ultimate Tensile Stress, MPa                                                                                                                                                         | 520                                                                 |  |  |
| c)  | Minimum Guaranteed Yield Stress, MPa                                                                                                                                                 | 415                                                                 |  |  |
| d)  | Minimum Elongation in gauge length of 200mm/50mm                                                                                                                                     | 16% in 200mm &<br>18% in 50mm                                       |  |  |
| e)  | Bend Ratio as per Clause 2.2.2 of Technical Provisions of the Bidding Documents                                                                                                      | Up to 25mm 1.5t<br>&<br>Over 25mm 2.0t                              |  |  |
| f)  | Chemical Properties                                                                                                                                                                  |                                                                     |  |  |
| -   | Carbon % $\leq$                                                                                                                                                                      | 0.26                                                                |  |  |
| -   | Manganese % $\leq$                                                                                                                                                                   | 1.35                                                                |  |  |
| -   | Phosphorus % $\leq$                                                                                                                                                                  | 0.04                                                                |  |  |
| -   | Sulfurs % $\leq$                                                                                                                                                                     | 0.05                                                                |  |  |
| 10. | Type of Steel Galvanizing                                                                                                                                                            | Hot Dip                                                             |  |  |
| 11. | Each member marked as per Clause 2.2.13 of Technical Provisions of the Bidding Documents                                                                                             | Yes                                                                 |  |  |
| 12. | Type of Steel for Anti-theft Nuts & Bolts                                                                                                                                            |                                                                     |  |  |
|     |                                                                                                                                                                                      | ISO 898-1; min Gr.<br>8.8                                           |  |  |
| (a) | Grade                                                                                                                                                                                | Or equivalent                                                       |  |  |
| (b) | Tensile Strength, MPa                                                                                                                                                                | 800 for $t \leq 16\text{mm}$                                        |  |  |

|     |                                                                                                  |                                    |  |  |
|-----|--------------------------------------------------------------------------------------------------|------------------------------------|--|--|
|     |                                                                                                  | 830 for t>16mm                     |  |  |
|     | (c) Minimum Guaranteed Yield Strength, MPa                                                       | 640 for t≤16mm                     |  |  |
|     | (d) Elongation % min.                                                                            | 660 for t>16mm                     |  |  |
|     | (e) Shear Strength, MPa                                                                          | 12                                 |  |  |
|     | (f) Bearing Strength, MPa                                                                        | 450                                |  |  |
|     | (g) Chemical Properties                                                                          | *                                  |  |  |
| 13. | Standard to be Followed for Material And Dimensions                                              |                                    |  |  |
|     | - Bolts (Anti-Theft)                                                                             | ISO 898-1 & DIN 7990 or equivalent |  |  |
|     | - Nut                                                                                            | ISO 898-2 & ISO 4034               |  |  |
|     | - Spring Lock Washer                                                                             | Or equivalent                      |  |  |
|     | - Plain Washers                                                                                  | DIN 127/128                        |  |  |
| 14. | Size of:                                                                                         | ASTM F436M                         |  |  |
|     | - Bolt (Anti-Theft)                                                                              | M16, M20 & M24                     |  |  |
|     | - Nut                                                                                            | M16, M20 & M24                     |  |  |
|     | - Spring Lock Washer                                                                             | M16, M20 & M24                     |  |  |
|     | - Plain Washer                                                                                   | M16, M20 & M24                     |  |  |
| 15. | Fabrication:                                                                                     |                                    |  |  |
|     | (a) Minimum thickness of members for which holes drilled                                         | 12mm                               |  |  |
|     | (b) Maximum thickness of members for which holes punched                                         | 19mm                               |  |  |
|     | (c) Difference between diameter of bolt holes and bolt shank                                     |                                    |  |  |
|     | - Splice Joints                                                                                  | 1.5mm                              |  |  |
|     | - Others                                                                                         | 1.5mm                              |  |  |
|     | (d) Method of Marking of the member                                                              | Stamping before Galvanizing        |  |  |
| 16. | Galvanizing:                                                                                     |                                    |  |  |
|     | (a) Standard for Galvanizing for steel section                                                   | ASTM A-123M                        |  |  |
|     | (b) Galvanizing for members/plates, min gm/m <sup>2</sup>                                        | 705                                |  |  |
|     | (c) Standard of Galvanizing for bolts, nuts and spring lock washers                              | ASTM A-153M                        |  |  |
|     | (d) Galvanizing for bolts, nuts and spring lock washers, min gm/m <sup>2</sup>                   | 345                                |  |  |
| 17. | Weight of towers, including galvanization, gusset plates, nuts & bolts, tower hardware etc. kgs. |                                    |  |  |
|     | (a) <u>Tower Type DS1</u>                                                                        |                                    |  |  |
|     | i- Basic Body (without Stubs)                                                                    |                                    |  |  |
|     | ii- Leg Extensions                                                                               |                                    |  |  |

|                           |                             |   |  |
|---------------------------|-----------------------------|---|--|
| iii-                      | (4 Nos. for complete tower) |   |  |
| a.                        | - do - 2.0 m                | * |  |
| b.                        | - do - 4.0 m                | * |  |
| c.                        | - do - 6.0 m                | * |  |
| d.                        | - do - 8.0 m                | * |  |
| iv-                       | Body Extension 6.0 m        | * |  |
| v-                        | Stubs                       |   |  |
|                           | (4 Nos. for complete tower) | * |  |
| (b) <u>Tower Type DA1</u> |                             |   |  |
| i-                        | Basic Body (without stubs)  | * |  |
| ii-                       | Leg Extensions              |   |  |
|                           | (4 Nos. for complete tower) |   |  |
| a.                        | - do - 2.0 m                | * |  |
| b.                        | - do - 4.0 m                | * |  |
| c.                        | - do - 6.0 m                | * |  |
| d.                        | - do - 8.0 m                | * |  |
| iii-                      | Body Extension 6.0 m        | * |  |
| iv-                       | Stubs                       |   |  |
|                           | (4 Nos. for complete tower) | * |  |
| (c) <u>Tower Type DD1</u> |                             |   |  |
| i-                        | Basic Body (without stubs)  | * |  |
| ii-                       | Leg Extensions              |   |  |
|                           | (4 Nos. for complete tower) |   |  |
| a.                        | - do - 2.0 m                | * |  |
| b.                        | - do - 4.0 m                | * |  |
| c.                        | - do - 6.0 m                | * |  |
| d.                        | - do - 8.0 m                | * |  |
| iii-                      | Body Extension 6.0 m        | * |  |
| iv-                       | Stubs                       |   |  |
|                           | (4 Nos. for complete tower) | * |  |
| (d) <u>Tower Type TDT</u> |                             |   |  |
| i-                        | Basic Body (without stubs)  |   |  |
| ii-                       | Leg Extensions              |   |  |
|                           | (4 Nos. for complete tower) |   |  |
| a.                        | - do - 2.0 m                |   |  |
| b.                        | - do - 4.0 m                |   |  |
| c.                        | - do - 6.0 m                |   |  |
| d.                        | - do - 8.0 m                |   |  |
| iii-                      | Body Extension 6.0 m        |   |  |
| iv-                       | Stubs                       |   |  |
|                           | (4 Nos. for complete tower) |   |  |
| (e) <u>Tower Type SGM</u> |                             |   |  |
| i-                        | Basic Body (without Stubs)  |   |  |
| ii-                       | Leg Extensions              |   |  |
|                           | (4 Nos. for complete tower) |   |  |
| a.                        | - do - 1.5 m                |   |  |
| b.                        | - do - 3.0 m                |   |  |

|                               |                                                                                                  |     |  |
|-------------------------------|--------------------------------------------------------------------------------------------------|-----|--|
| c. - do - 4.5 m               |                                                                                                  |     |  |
| d. - do - 6.0 m               |                                                                                                  |     |  |
| iii- Body Extension 4.5 m     |                                                                                                  |     |  |
| iv- Body Extension 9.0 m      |                                                                                                  |     |  |
| v- Stubs                      |                                                                                                  |     |  |
| (4 Nos. for complete tower)   |                                                                                                  |     |  |
| (f) <u>Tower Type AGM</u>     |                                                                                                  |     |  |
| i- Basic Body (without stubs) |                                                                                                  |     |  |
| ii- Leg Extensions            |                                                                                                  |     |  |
| (4 Nos. for complete tower)   |                                                                                                  |     |  |
| a. - do - 1.5 m               |                                                                                                  |     |  |
| b. - do - 3.1 m               |                                                                                                  |     |  |
| c. - do - 4.6 m               |                                                                                                  |     |  |
| d. - do - 6.1 m               |                                                                                                  |     |  |
| iii- Body Extension 4.6 m     |                                                                                                  |     |  |
| iv- Body Extension 9.1 m      |                                                                                                  |     |  |
| v- Stubs                      |                                                                                                  |     |  |
| (4 Nos. for complete tower)   |                                                                                                  |     |  |
| (g) <u>Tower Type DD1</u>     |                                                                                                  |     |  |
| i- Basic Body (without stubs) |                                                                                                  |     |  |
| ii- Leg Extensions            |                                                                                                  |     |  |
| (4 Nos. for complete tower)   |                                                                                                  |     |  |
| a. - do - 1.5 m               |                                                                                                  |     |  |
| b. - do - 3.1 m               |                                                                                                  |     |  |
| c. - do - 4.6 m               |                                                                                                  |     |  |
| d. - do - 6.1 m               |                                                                                                  |     |  |
| iii- Body Extension 4.6 m     |                                                                                                  |     |  |
| iv- Body Extension 9.1 m      |                                                                                                  |     |  |
| v- Stubs                      |                                                                                                  |     |  |
| (4 Nos. for complete tower)   |                                                                                                  |     |  |
| (h) <u>Tower Type SGM</u>     |                                                                                                  |     |  |
| i- Basic Body (without Stubs) |                                                                                                  |     |  |
| ii- Leg Extensions            |                                                                                                  |     |  |
| (4 Nos. for complete tower)   |                                                                                                  |     |  |
| a. - do - 1.5 m               |                                                                                                  |     |  |
| b. - do - 3.0 m               |                                                                                                  |     |  |
| c. - do - 4.5 m               |                                                                                                  |     |  |
| d. - do - 6.0 m               |                                                                                                  |     |  |
| iii- Body Extension 4.5 m     |                                                                                                  |     |  |
| iv- Body Extension 9.0 m      |                                                                                                  |     |  |
| v- Stubs                      |                                                                                                  |     |  |
| (4 Nos. for complete tower)   |                                                                                                  |     |  |
| 18.                           | All tests, as called for in the Technical Provisions, will be carried out within the quoted cost | Yes |  |
| 19.                           | Packing Provisions                                                                               | *   |  |
| 20.                           | Maximum production capacity of Steel Towers per annum                                            | *   |  |

21. Maximum Capacity of galvanizing  
plant per annum

\*

|  |  |
|--|--|
|  |  |
|  |  |

**Note:**

‘A’- Employers’ Specified Data/Parameters

‘B’- Bidder’s Proposed Data/Parameters

‘C’- Remarks Supporting the Proposed Deviation in Column ‘B’

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column ‘B’

Name of Manufacturer:

---

Signed and Stamped by Manufacturer:

---

Name of the Bidder:

---

Signed and Stamped by the Bidder:

---

**SPECIFIC PLANT DATA FOR  
795 kcmil ACSR "DRAKE" CONDUCTOR**

| Sr. No.   | Information Required                                                                                                       | 'A'                    | 'B' | 'C' |
|-----------|----------------------------------------------------------------------------------------------------------------------------|------------------------|-----|-----|
| <b>A-</b> | <b>GENERAL</b>                                                                                                             |                        |     |     |
| 1.        | Origin of Material<br>(Maker's Name & Address)                                                                             |                        |     |     |
| 2.        | Origin of Conductor<br>(Manufacturer's Name & Address)                                                                     |                        |     |     |
| 3.        | Standard Specification Applied                                                                                             | ASTM B230, B232 & B498 |     |     |
| <b>B-</b> | <b>DATA OF COMPLETE CONDUCTOR</b>                                                                                          |                        |     |     |
| 1.        | Code Name                                                                                                                  | ACSR "Drake"           |     |     |
| 2.        | Diameter (mm)                                                                                                              | 28.14                  |     |     |
| 3.        | Cross Section (mm <sup>2</sup> )                                                                                           | 468                    |     |     |
| 4.        | D.C. Resistance at 25 °C (Ω/km)                                                                                            | 0.07195                |     |     |
| 5.        | Rated ultimate strength (kgs)                                                                                              | 14174                  |     |     |
| 6.        | Weight (kg/km)                                                                                                             | 1628                   |     |     |
| 7.        | Lay Ratio:                                                                                                                 |                        |     |     |
|           | a) Aluminum                                                                                                                |                        |     |     |
|           | i) Outermost Layer                                                                                                         | 10 to 13               |     |     |
|           | ii) Layer immediately beneath outside layer                                                                                | 10 to 16               |     |     |
|           | b) Steel                                                                                                                   |                        |     |     |
|           | - Outermost 6 wire Layer                                                                                                   | 18 to 30               |     |     |
| 8.        | Direction of Lay                                                                                                           |                        |     |     |
|           | a) Aluminum                                                                                                                |                        |     |     |
|           | i) Outermost Layer                                                                                                         | Right Hand             |     |     |
|           | ii) Second Layer                                                                                                           | Left Hand              |     |     |
|           | b) Steel                                                                                                                   |                        |     |     |
|           | - Outermost 6 wire Layer                                                                                                   | Right Hand             |     |     |
| 9.        | Nominal Copper Equivalent Area (mm <sup>2</sup> )                                                                          | 246                    |     |     |
| 10.       | Current carrying capacity, Amps<br>(40°C ambient, 40°C rise, 0.6 m/sec wind and 0.7 emissivity & 0.5 absorptivity factors) | 840                    |     |     |
| 11.       | Volume conductivity %age of IACS                                                                                           | 61.2                   |     |     |
| 12.       | All tests, as called for in the Technical Provisions, will be carried out within the quoted cost                           | Yes                    |     |     |
| <b>C-</b> | <b>DATA FOR ALUMINUM</b>                                                                                                   |                        |     |     |
| 1.        | No. of Wires                                                                                                               | 26                     |     |     |
| 2.        | Diameter:                                                                                                                  |                        |     |     |
|           | a) Dia. of Each wire (mm)                                                                                                  | 4.44                   |     |     |
|           | b) Dia. of Outermost Layer (mm)                                                                                            | 28.14                  |     |     |
|           | c) Dia. of Second Layer (mm)                                                                                               | 19.26                  |     |     |
| 3.        | Total Cross-sectional area of Aluminum wires (mm <sup>2</sup> )                                                            | 402.6                  |     |     |



|                               |                                                                                  |                                      |  |  |
|-------------------------------|----------------------------------------------------------------------------------|--------------------------------------|--|--|
| 4.                            | Resistivity at 20 °C $\Omega \cdot \text{mm}^2/\text{m}$                         | 0.028172                             |  |  |
| 5.                            | Minimum Ultimate Tensile Strength of Aluminum Strand ( $\text{kg}/\text{mm}^2$ ) | 16.3                                 |  |  |
| 6.                            | Density at 20 °C ( $\text{kg}/\text{dm}^3$ )                                     | 2.705                                |  |  |
| 7.                            | Co-efficient of linear expansion / °C                                            | $23 \times 10^{-6}$                  |  |  |
| 8.                            | Aluminum weight ( $\text{kg}/\text{km}$ )                                        | 1116.2                               |  |  |
| 9.                            | Type of joints in individual wires (during stranding)                            | Cold Pressure Butt Welding           |  |  |
| 10.                           | Distance between two consecutive joints in complete stranded conductor (m)       | 15                                   |  |  |
| 11.                           | Distance over which resistance butt welding joints shall be annealed             | 150mm on each side of the Joint      |  |  |
| <b>D- DATA FOR STEEL CORE</b> |                                                                                  |                                      |  |  |
| 1.                            | No. of Wires                                                                     | 7                                    |  |  |
| 2.                            | Dia. of each wire (mm)                                                           | 3.45                                 |  |  |
| 3.                            | Dia. of 6 wire steel core layer (mm)                                             | 10.35                                |  |  |
| 4.                            | Total cross-sectional area ( $\text{mm}^2$ )                                     | 65.4                                 |  |  |
| 5.                            | Resistivity at 20 °C $\Omega \cdot \text{mm}^2/\text{m}$                         | 0.19157                              |  |  |
| 6.                            | Ultimate tensile stress min. ( $\text{kg}/\text{mm}^2$ )                         | 144                                  |  |  |
| 7.                            | Stress at 1% extension min. ( $\text{kg}/\text{mm}^2$ )                          | 126.5                                |  |  |
| 8.                            | Zinc coating                                                                     |                                      |  |  |
|                               | (a) Weight of Zinc coating ( $\text{g}/\text{m}^2$ )                             | 260                                  |  |  |
|                               | (b) Process of Zinc coating                                                      | Hot Dip                              |  |  |
|                               | (c) Minimum number of one-minute dips in copper sulphate solution                | 4                                    |  |  |
| 9.                            | Chemical Requirements                                                            |                                      |  |  |
|                               | (a) Carbon, %                                                                    | 0.50 – 0.85                          |  |  |
|                               | (b) Manganese, %                                                                 | 0.50 – 1.10                          |  |  |
|                               | (c) Phosphorus, % max.                                                           | 0.035                                |  |  |
|                               | (d) Sulfur, % max                                                                | 0.045                                |  |  |
|                               | (e) Silicon, %                                                                   | 0.10 – 0.35                          |  |  |
| 10.                           | Density at 20 °C ( $\text{kg}/\text{dm}^3$ )                                     | 7.780                                |  |  |
| 11.                           | Steel core weight ( $\text{kg}/\text{km}$ )                                      | 511.95                               |  |  |
| 12.                           | Type of joints in base rod                                                       | Resistant butt welding               |  |  |
| <b>E- REEL</b>                |                                                                                  |                                      |  |  |
| 1.                            | Material and Type of Reel                                                        | Steel Frame with Wood filling        |  |  |
| 2.                            | Dimensions                                                                       |                                      |  |  |
|                               | (a) Outside width (mm)                                                           | *                                    |  |  |
|                               | (b) Flange dia. (mm)                                                             | *                                    |  |  |
|                               | (c) Drum dia. (mm)                                                               | *                                    |  |  |
|                               | (d) Flange thickness(mm)                                                         | *                                    |  |  |
|                               | (e) Inside width (mm)                                                            | *                                    |  |  |
|                               | (f) Lagging thickness (mm)                                                       | *                                    |  |  |
|                               | (g) Arbor hole dia. (mm)                                                         | *                                    |  |  |
| 3.                            | Protection on inner flanges of reel                                              | Moisture Resistant Solid Fiber Board |  |  |
| 4.                            | Protection on two outer layers of                                                | Moisture Resistant                   |  |  |

|     |                                                                        |                                         |  |  |
|-----|------------------------------------------------------------------------|-----------------------------------------|--|--|
|     | conductor                                                              | Paper                                   |  |  |
| 5.  | Protective covering for overall wrapping                               | Moisture Resistant<br>Solid Fiber Board |  |  |
| 6.  | Length of Conductor on Reel (m)                                        | 3200                                    |  |  |
| 7.  | Preservative used for wood                                             | Yes                                     |  |  |
| 8.  | Weight of Reel with Conductor (kg)                                     | *                                       |  |  |
| 9.  | Weight of Reel without Conductor (kg)                                  | *                                       |  |  |
| 10. | Conductor Reels suitable for tension stringing?                        | Yes                                     |  |  |
| 11. | Packing Provisions                                                     | *                                       |  |  |
| 12. | Marking of Reels as per Technical Provisions of the Bidding Documents  | Yes                                     |  |  |
| 13. | Maximum production capacity of the offered item per month (kilometers) | *                                       |  |  |

**Note:**

‘A’- Purchaser’s Specified Data/Parameters

‘B’- Bidder’s Proposed Data/Parameters

‘C’- Remarks Supporting the Proposed Deviation in Column ‘B’

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column ‘B’

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_

**SPECIFIC GOODS DATA FOR  
EHS GALVANIZED STEEL SHIELDWIRE**

| Sr. No. | Description                                                                                          | 'A'                                                    | 'B'   | 'C'   |
|---------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|-------|
| 1.      | Origin of Material (Maker's Name & Address)                                                          | _____                                                  |       |       |
| 2.      | Origin of Shield wire (Maker's Name & Address)                                                       | _____                                                  |       |       |
| 3.      | Type and material (including grade of steel)                                                         | EHS Grade<br><u>Class B Steel</u>                      | _____ | _____ |
| 4.      | Standard Specifications applied                                                                      | <u>ASTM A-363</u>                                      | _____ | _____ |
| 5.      | No. of strands                                                                                       | <u>07</u>                                              | _____ | _____ |
| 6.      | Strand diameter, mm                                                                                  | <u>3.048</u>                                           | _____ | _____ |
| 7.      | Diameter of shield wire, mm                                                                          | <u>9.15</u>                                            | _____ | _____ |
| 8.      | Nominal cross section of shield wire, mm <sup>2</sup>                                                | <u>51.076</u>                                          | _____ | _____ |
| 9.      | Ultimate strength of shield wire, kg                                                                 | <u>6985</u>                                            | _____ | _____ |
| 10.     | Weight of shield wire per kilometer, kg                                                              | <u>406</u>                                             | _____ | _____ |
| 11.     | Nominal DC resistance at 20°C ohms/km                                                                | <u>3.75</u>                                            | _____ | _____ |
| 12.     | Current carrying capacity, Amp                                                                       | <u>16</u>                                              | _____ | _____ |
| 13.     | Zinc coating Class B thickness in gm/m <sup>2</sup>                                                  | <u>Class B, 519</u>                                    | _____ | _____ |
| 14.     | All tests, as called for in the Technical Specifications, will be carried out within the quoted cost | <u>Yes</u>                                             | _____ | _____ |
| 15.     | Packing:                                                                                             |                                                        |       |       |
|         | (a) Length of shield wire on each drum, meter                                                        | <u>1600</u>                                            | _____ | _____ |
|         | (b) Net weight, kg                                                                                   | <u>*</u>                                               | _____ | _____ |
|         | (c) Gross weight, kg                                                                                 | <u>*</u>                                               | _____ | _____ |
|         | (d) Details of protective covering                                                                   | Moisture<br>Resistant<br>Protective<br><u>covering</u> | _____ | _____ |

**Note:**

'A'- Purchaser's Specified Data/Parameters

- ‘B’- Bidder’s Proposed Data/Parameters
- ‘C’- Remarks Supporting the Proposed Deviation in Column ‘B’
- (\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column ‘B’

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_

**SPECIFIC PLANT DATA FOR  
OPTICAL FIBER GROUND WIRE (OPGW)**

| Sr. No.   | Description                                                                                   | 'A'                      | 'B'   | 'C'   |
|-----------|-----------------------------------------------------------------------------------------------|--------------------------|-------|-------|
| <b>A-</b> | <b>GENERAL</b>                                                                                |                          |       |       |
| i)        | Manufacturer's Name:                                                                          | _____                    |       |       |
| ii)       | Address of Manufacturing Facility                                                             | _____                    |       |       |
| iii)      | Website of Manufacturer                                                                       | _____                    |       |       |
| iv)       | Contact Person of Manufacturer for this Project                                               | _____                    |       |       |
| v)        | Email of Contact Person                                                                       | _____                    |       |       |
| vi)       | Origin of Material (Makers Name & Address)                                                    | _____                    |       |       |
| vii)      | Model Number:                                                                                 |                          |       |       |
|           | OPGW Cable,                                                                                   | *                        | _____ | _____ |
|           | Optical Fiber,                                                                                | *                        | _____ | _____ |
| viii)     | Applicable Standards for:                                                                     |                          |       |       |
|           | OPGW Cable,                                                                                   | *                        | _____ | _____ |
|           | Optical Fiber,                                                                                | <u>ITU-T G.652</u>       | _____ | _____ |
|           | Metallic Part,                                                                                | ASTM B415<br>& B416      | _____ | _____ |
|           | Tests.                                                                                        | IEEE Std.<br>1138 (2009) | _____ | _____ |
| ix)       | All tests, as called in the Technical Provisions, will be carried out within the quoted cost. | <u>Yes</u>               | _____ | _____ |
| x)        | Type Test certificates from independent Lab.                                                  |                          |       |       |
|           | Carried out,                                                                                  | <u>Yes</u>               | _____ | _____ |
|           | Carried in the year,                                                                          | *                        | _____ | _____ |
|           | Testing Agency (Name),                                                                        | *                        | _____ | _____ |
|           | Testing Station / Place,                                                                      | *                        | _____ | _____ |
|           | Country.                                                                                      | *                        | _____ | _____ |
| xi)       | Manufacturer's Quality System in accordance with ISO 9000, 9001, 9002, 9003 & 9004.           | <u>Yes</u>               | _____ | _____ |
|           | Applicable Standard.                                                                          | *                        | _____ | _____ |
|           | Certified by (Company Name).                                                                  | *                        | _____ | _____ |
|           | Certification valid till (year).                                                              | *                        | _____ | _____ |

**1. TECHNICAL DETAIL**

**1.1 OPGW CONSTRUCTION:****1.1.1 CENTRAL FIBER OPTIC UNIT:****1.1.1.1 CENTRAL METALLIC UNIT:**

| Sr. No. | Description                                                                                         | ‘A’                | ‘B’               | ‘C’               |
|---------|-----------------------------------------------------------------------------------------------------|--------------------|-------------------|-------------------|
| i)      | Central hollow metallic extruded tube housing the optical fiber buffer tubes.                       | <u>Yes</u>         | <u>          </u> | <u>          </u> |
| ii)     | Material of central hollow tube is Aluminium.                                                       | <u>Yes</u>         | <u>          </u> | <u>          </u> |
| iii)    | Minimum thickness of the central hollow metallic tube wall.                                         | <u>1.6 to 2 mm</u> | <u>          </u> | <u>          </u> |
| iv)     | Central hollow metallic tube, outer diameter, mm                                                    | <u>*</u>           | <u>          </u> | <u>          </u> |
| v)      | Central hollow metallic tube, inner diameter, mm                                                    | <u>*</u>           | <u>          </u> | <u>          </u> |
| vi)     | Number of loose buffer tubes inside the central hollow metallic extruded tube                       |                    |                   |                   |
|         | (a) for 24-fiber OPGW                                                                               | <u>3 to 4</u>      | <u>          </u> | <u>          </u> |
| vii)    | The hydrogen absorbent gel is filled in loose tube                                                  | <u>Yes</u>         | <u>          </u> | <u>          </u> |
| viii)   | The buffer tubes are helically stranded around a metallic support member (central strength member). | <u>Yes</u>         | <u>          </u> | <u>          </u> |
| ix)     | Material of metallic support member (central strength member).                                      | <u>*</u>           | <u>          </u> | <u>          </u> |
| x)      | Material of Thermal Tap applied on group of plastic buffer tubes.                                   | <u>*</u>           | <u>          </u> | <u>          </u> |

**1.1.1.2 FIBER UNIT:**

| Sr. No. | Description                                                                                                           | ‘A’        | ‘B’               | ‘C’               |
|---------|-----------------------------------------------------------------------------------------------------------------------|------------|-------------------|-------------------|
| i)      | Loose buffer tubes are housed in the central hollow metallic extruded tube.                                           | <u>Yes</u> | <u>          </u> | <u>          </u> |
| ii)     | Loose buffer tubes (housed in central hollow metallic tube) are made of polybutylene terephthalate or metal material. | <u>Yes</u> | <u>          </u> | <u>          </u> |

| Sr. No. | Description                                                              | ‘A’           | ‘B’               | ‘C’               |
|---------|--------------------------------------------------------------------------|---------------|-------------------|-------------------|
| iii)    | Buffer tubes, outer diameter, mm                                         | <u>*</u>      | <u>          </u> | <u>          </u> |
| iv)     | Buffer tubes, inner diameter, mm                                         | <u>*</u>      | <u>          </u> | <u>          </u> |
| v)      | Optical Fibers are loosely housed in the buffer tubes.                   | <u>Yes</u>    | <u>          </u> | <u>          </u> |
| vi)     | The buffer tubes are filled with water proof and hydrogen absorbent gel. | <u>Yes</u>    | <u>          </u> | <u>          </u> |
| vii)    | Type of water proof jelly filled in buffer tubes.                        | <u>*</u>      | <u>          </u> | <u>          </u> |
| viii)   | Gel dripping temperature greater than 85°C.                              | <u>Yes</u>    | <u>          </u> | <u>          </u> |
| ix)     | Buffer tubes are colour coded according to EIA-598A.                     | <u>Yes</u>    | <u>          </u> | <u>          </u> |
| x)      | Total number of fibers in the OPGW (24/36/48 fibers).                    | <u>*</u>      | <u>          </u> | <u>          </u> |
| xi)     | Total number of fibers per buffer tube (maximum)                         |               |                   |                   |
|         | (a) for 24-fiber OPGW                                                    | <u>8 nos.</u> | <u>          </u> | <u>          </u> |
| xii)    | Structural details of complete fiber optic unit are included.            | <u>Yes</u>    | <u>          </u> | <u>          </u> |

**1.1.2 STANDARD METALLIC WIRE (ARMOUR):**

| Sr. # | Description                                                                               | ‘A’        | ‘B’               | ‘C’               |
|-------|-------------------------------------------------------------------------------------------|------------|-------------------|-------------------|
| i)    | Armour comprises of single layer (two layers if required)                                 | <u>Yes</u> | <u>          </u> | <u>          </u> |
| ii)   | First/Inner layer of armour (standard wires) is made of aluminium class steel.            | <u>ACS</u> | <u>          </u> | <u>          </u> |
|       | (a) Number of strands of first layer.                                                     | <u>*</u>   | <u>          </u> | <u>          </u> |
|       | (b) Diameter of individual strand wire in the first layer, mm                             | <u>*</u>   | <u>          </u> | <u>          </u> |
| iii)  | Second/Outer layer of armour (standard wires) is made of aluminium alloy (if applicable). | <u>*</u>   | <u>          </u> | <u>          </u> |
|       | (a) Number of strands in the second layer.                                                | <u>*</u>   | <u>          </u> | <u>          </u> |
|       | (b) Diameter of individual strand wire in the second layer, mm                            | <u>*</u>   | <u>          </u> | <u>          </u> |
| iv)   | Cross-section of the metallic unit, mm <sup>2</sup>                                       | <u>*</u>   | <u>          </u> | <u>          </u> |

**1.1.3 OPGW CHARACTERISTIC:**

| Sr. # | Description                                                                                                                | ‘A’          | ‘B’   | ‘C’   |
|-------|----------------------------------------------------------------------------------------------------------------------------|--------------|-------|-------|
| i)    | Overall Diameter of OPGW, mm.                                                                                              | <u>≤12</u>   | _____ | _____ |
| ii)   | Nominal cross-section of the OPGW<br>(total conductor area), mm <sup>2</sup>                                               | <u>*</u>     | _____ | _____ |
| iii)  | Maximum permissible pulling force, Kg.                                                                                     | <u>*</u>     | _____ | _____ |
| iv)   | Ultimate breaking force, Kg                                                                                                | <u>≥7000</u> | _____ | _____ |
| v)    | Minimum bending radius (without fiber<br>damage), mm                                                                       | <u>≤ 200</u> | _____ | _____ |
| vi)   | Nominal DC resistance at 20°C, ohm/km.                                                                                     | <u>≤0.75</u> | _____ | _____ |
| vii)  | Thermally efficient rated short circuit<br>current (Maximum 1 sec. current for<br>temperature rise from 20 to 200 °C), kA. | <u>≥6</u>    | _____ | _____ |
| viii) | Modulus of elasticity, kg/mm <sup>2</sup> .                                                                                | <u>*</u>     | _____ | _____ |
| ix)   | Coefficient of linear expansion / °C.                                                                                      | <u>*</u>     | _____ | _____ |
| x)    | OPGW Nominal weight without grease/<br>with grease, Kg/Km.                                                                 | <u>≤460</u>  | _____ | _____ |

**Climatic Requirement:**

|      |                                     |                  |       |       |
|------|-------------------------------------|------------------|-------|-------|
| i)   | Operating temperature range, °C.    | <u>-20 to 80</u> | _____ | _____ |
| ii)  | Storage temperature range, °C.      | <u>-20 to 85</u> | _____ | _____ |
| iii) | Installation temperature range, °C. | <u>-20 to 85</u> | _____ | _____ |
| iv)  | Relative humidity range, %          | <u>5 to 100</u>  | _____ | _____ |

**1.1.4 FIBER CHARACTERISTIC:**

| Sr. # | Description                  | ‘A’                    | ‘B’   | ‘C’   |
|-------|------------------------------|------------------------|-------|-------|
| i)    | Single mode.                 | <u>Yes</u>             | _____ | _____ |
| ii)   | Material.                    | <u>Glass</u>           | _____ | _____ |
| iii)  | Wavelength, nm.              | <u>1310 &amp; 1550</u> | _____ | _____ |
| iv)   | Core concentricity error, μm | <u>≤1</u>              | _____ | _____ |
| v)    | Cladding diameter, μm        | <u>125 ±2</u>          | _____ | _____ |



|       |                                                                          |                               |                             |                             |
|-------|--------------------------------------------------------------------------|-------------------------------|-----------------------------|-----------------------------|
| vi)   | Mode field diameter, $\mu\text{m}$                                       | <u>8.1-9.7</u>                | <u>                    </u> | <u>                    </u> |
| vii)  | Cut-off wavelength, nm                                                   | <u><math>\leq 1260</math></u> | <u>                    </u> | <u>                    </u> |
| viii) | Coating diameter, $\mu\text{m}$ .                                        | <u>*</u>                      | <u>                    </u> | <u>                    </u> |
| ix)   | Chromatic dispersion:                                                    |                               |                             |                             |
|       | (a) At 1310 nm, ps/nm.km,                                                | <u><math>\leq 3.5</math></u>  | <u>                    </u> | <u>                    </u> |
|       | (b) At 1550 nm, ps/nm.km.                                                | <u><math>\leq 20</math></u>   | <u>                    </u> | <u>                    </u> |
| x)    | Maximum Attenuation:                                                     |                               |                             |                             |
|       | (a) At 1310 nm, dB/km,                                                   | <u><math>\leq 0.35</math></u> | <u>                    </u> | <u>                    </u> |
|       | (b) At 1550 nm, dB/km.                                                   | <u><math>\leq 0.20</math></u> | <u>                    </u> | <u>                    </u> |
| xi)   | Difference in attenuation, coefficient when measured from both ends, dB. | <u>0.05</u>                   | <u>                    </u> | <u>                    </u> |
| xii)  | Maximum splicing loss, dB.                                               | <u>0.05</u>                   | <u>                    </u> | <u>                    </u> |
| xiii) | Fiber colour coded according to EIA-598A.                                | <u>Yes</u>                    | <u>                    </u> | <u>                    </u> |
| xiv)  | Fiber reserve length, %                                                  | <u><math>\geq 0.45</math></u> | <u>                    </u> | <u>                    </u> |
| xv)   | Transmission speed. Mbit/s.                                              | <u>Up to 2488</u>             | <u>                    </u> | <u>                    </u> |

## 2. OPGW PERFORMANCE DATA

| Sr. No. | Description                                                       | 'A'       | 'B'                         | 'C'                         |
|---------|-------------------------------------------------------------------|-----------|-----------------------------|-----------------------------|
| i)      | Date of first commercial operation of the offered OPGW, dd-mm-yy. | <u>*</u>  | <u>                    </u> | <u>                    </u> |
| ii)     | Guaranteed service life, years (min).                             | <u>35</u> | <u>                    </u> | <u>                    </u> |

## 3. SUPPORTING DOCUMENTS:

| Sr. No. | Description                                               | 'A'        | 'B'                         | 'C'                         |
|---------|-----------------------------------------------------------|------------|-----------------------------|-----------------------------|
| i)      | Cable cross-section drawings enclosed & details attached. | <u>Yes</u> | <u>                    </u> | <u>                    </u> |
| ii)     | Reference list attached.                                  | <u>Yes</u> | <u>                    </u> | <u>                    </u> |
| iii)    | Client's certificates enclosed.                           | <u>Yes</u> | <u>                    </u> | <u>                    </u> |
| iv)     | Technical literature enclosed.                            | <u>Yes</u> | <u>                    </u> | <u>                    </u> |
| iv)     | Type Test Report enclosed.                                | <u>Yes</u> | <u>                    </u> | <u>                    </u> |

## 4. PACKING SPECIFICATION

| Sr. No. | Description             | 'A'         | 'B'                         | 'C'                         |
|---------|-------------------------|-------------|-----------------------------|-----------------------------|
| i)      | Length of OPGW reel, m. | <u>5000</u> | <u>                    </u> | <u>                    </u> |

|      |                                                  |     |  |  |
|------|--------------------------------------------------|-----|--|--|
| ii)  | Tolerance of OPGW per drum for specified lengths | +2% |  |  |
| iii) | Non-returnable Reel material                     | *   |  |  |
| iv)  | Overall reel dimension                           |     |  |  |
|      | (a) Diameter, cm.                                | *   |  |  |
|      | (b) Width, cm.                                   | *   |  |  |
|      | (c) Weight, kg.                                  | *   |  |  |
| v)   | Reel Spindle hole diameter, mm.                  | *   |  |  |
| vi)  | Packing covering                                 | *   |  |  |

**Note:**

- 1) All values shall be in metric system.
- 2) Bidder has to fill-up above details to verify the Technical Data of his proposed manufacturer.
- 3) Bidder/Manufacturer shall completely fill the Schedule of Technical Data.
- 4) Detailed dimensional drawings showing material and other details/data must be submitted with the bid.

‘A’- Employer’s Specified Data/Parameters

‘B’- Bidder’s Proposed Data/Parameters

‘C’- Remarks Supporting the Proposed Deviation in Column ‘B’

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column ‘B’

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_

**SPECIFIC PLANT DATA FOR  
JOINT BOX**

| <b>Sr. No.</b> | <b>Information Required</b>                                     | <b>Units</b> | <b>Standard to be followed/Required Values</b> | <b>Data to be Provided by the Manufacturer</b> |
|----------------|-----------------------------------------------------------------|--------------|------------------------------------------------|------------------------------------------------|
| <b>1.</b>      | <b>GENERAL</b>                                                  |              |                                                |                                                |
| i.             | Manufacturer                                                    |              |                                                |                                                |
| ii.            | Model Number                                                    |              |                                                |                                                |
| iii.           | Applicable Standards                                            |              | ITU-T & IEC                                    |                                                |
| iv.            | Type tests carried out                                          |              |                                                | yes                                            |
| <b>2.</b>      | <b>DESIGN DATA</b>                                              |              |                                                |                                                |
| i.             | Material of housing                                             |              |                                                |                                                |
| ii.            | Protection Class                                                |              | IP65                                           |                                                |
| iii.           | Number of cable entries                                         |              | ≥ 4                                            |                                                |
| iv.            | Hardware and metallic parts treated with anti-corrosion element |              |                                                | yes                                            |
| v.             | Paint thickness                                                 | mm           |                                                |                                                |
| vi.            | Dimensions:                                                     |              |                                                |                                                |
| vii.           | Width                                                           | mm           |                                                |                                                |
| viii.          | Height                                                          | mm           |                                                |                                                |
| ix.            | Depth                                                           | mm           |                                                |                                                |
| x.             | Weight                                                          | Kg           |                                                |                                                |
| xi.            | Climatic requirements:                                          |              |                                                |                                                |
| xii.           | operation temperature:                                          |              |                                                |                                                |
| xiii.          | Maximum                                                         | °C           | 80                                             |                                                |
| xiv.           | Minimum                                                         | °C           | -10                                            |                                                |
| xv.            | relative humidity:                                              |              |                                                |                                                |
| xvi.           | Maximum                                                         | %            | 95                                             |                                                |
| xvii.          | Minimum                                                         | %            | 5                                              |                                                |
| <b>3.</b>      | <b>OTHER PERFORMANCE DATA</b>                                   |              |                                                |                                                |
| i.             | Date of first commercial operation of offered Joint Box         | dd-mm-yy     |                                                |                                                |
| ii.            | Reference list attached                                         |              |                                                | yes                                            |
| <b>4.</b>      | <b>SUPPORTING DOCUMENTS</b>                                     |              |                                                |                                                |
| i.             |                                                                 |              |                                                |                                                |

- Technical literature enclosed

yes
- ii.

Type test reports enclosed

**Note:**

- i. Bidder has to fill-up above details to verify the Technical Data of his proposed Manufacturer
- ii. All values shall be in metric system.

Name of Manufacturer:

Signed and Stamped by Manufacturer:

Name of the Bidder:

Signed and Stamped by the Bidder:

**SPECIFIC PLANT DATA FOR  
UNDERGROUND FIBER OPTIC CABLE**

| Sr. No.                  | Information Required                                                                             | 'A'                           | 'B' | 'C' |
|--------------------------|--------------------------------------------------------------------------------------------------|-------------------------------|-----|-----|
| <b>A- GENERAL</b>        |                                                                                                  |                               |     |     |
| 1.                       | Manufacturer's Name & Address                                                                    |                               |     |     |
| 2.                       | Model Number                                                                                     | *                             |     |     |
| 3.                       | Standard Specification Applied                                                                   | ITUT-T & IEC                  |     |     |
| 4.                       | All tests, as called for in the Technical Provisions, will be carried out within the quoted cost | Yes                           |     |     |
| <b>B- OPTICAL FIBERS</b> |                                                                                                  |                               |     |     |
| 1.                       | Single mode                                                                                      | Yes                           |     |     |
| 2.                       | Material                                                                                         | Glass                         |     |     |
| 3.                       | core diameter, $\mu\text{m}$                                                                     | 9 to $10 \pm 0.5$             |     |     |
| 4.                       | Core concentricity error, $\mu\text{m}$                                                          | < 1                           |     |     |
| 5.                       | Cladding diameter, $\mu\text{m}$                                                                 | $125 \pm 2$                   |     |     |
| 6.                       | Maximum cladding non-circularity, %                                                              | 2                             |     |     |
| 7.                       | Mode field diameter, $\mu\text{m}$                                                               | $8.6 \text{ to } 9.5 \pm 0.6$ |     |     |
| 8.                       | Cut-off wavelength                                                                               | $\leq 1270$                   |     |     |
| 9.                       | Chromatic dispersion                                                                             |                               |     |     |
| -                        | At 1310 (ps/nm.km)                                                                               | < 4                           |     |     |
| -                        | At 1550 (ps/nm.km)                                                                               | < 20                          |     |     |
| 10.                      | Maximum Attenuation                                                                              |                               |     |     |
| -                        | At 1310 (dB/km)                                                                                  | $\leq 0.35$                   |     |     |
| -                        | At 1550 (dB/km)                                                                                  | $\leq 0.20$                   |     |     |
| 11.                      | Difference in attenuation coefficient when measured from both ends, dB                           | 0.05                          |     |     |
| <b>C- CABLE DESIGN</b>   |                                                                                                  |                               |     |     |
| 1.                       | Number of Fibers                                                                                 | 24                            |     |     |
| 2.                       | Central strength member:                                                                         |                               |     |     |
| -                        | material (non-metallic)                                                                          | *                             |     |     |
| -                        | diameter (min) mm                                                                                | *                             |     |     |
| 3.                       | Buffer tube Construction:                                                                        |                               |     |     |
| a)                       | Loose Buffer tube (with loose fibers in jelly compound)                                          | Yes                           |     |     |
| b)                       | Number of tubes                                                                                  | $\geq 3$                      |     |     |
| c)                       | Material of tubes                                                                                | *                             |     |     |
| d)                       | Inner Diameter (min)                                                                             | *                             |     |     |
| e)                       | Outer diameter (mm)                                                                              | *                             |     |     |
| f)                       | Thickness, mm                                                                                    | $\geq 0.4$                    |     |     |
| g)                       | Tube filling compound                                                                            | Moisture Proof Gel            |     |     |
| 4.                       | Protective coating (Primary layer above coating)                                                 |                               |     |     |
| -                        | Material                                                                                         | UV Cured Acrylate             |     |     |

|                                                                                           |       |       |       |
|-------------------------------------------------------------------------------------------|-------|-------|-------|
| - Thickness min. (mm)                                                                     | 0.25  | <hr/> | <hr/> |
| 5. water blocking compound (moisture resistance filling compound around & inside the tube | Yes   | <hr/> | <hr/> |
| 6. Filling compound in the tube is non hygroscopic                                        | Yes   | <hr/> | <hr/> |
| 7. Wrapping cover around the tube.                                                        | *     | <hr/> | <hr/> |
| 8. Inner sheath:                                                                          |       |       |       |
| - Material                                                                                | PE    | <hr/> | <hr/> |
| - Nominal thickness, mm                                                                   | 1.5   | <hr/> | <hr/> |
| 9. Strength member reinforcing layer:                                                     |       |       |       |
| - Material                                                                                | *     | <hr/> | <hr/> |
| - Nominal thickness, mm                                                                   | *     | <hr/> | <hr/> |
| 10. Intermediate sheath:                                                                  |       |       |       |
| - Material                                                                                | PE    | <hr/> | <hr/> |
| - Thickness mm                                                                            | 1     | <hr/> | <hr/> |
| - Color                                                                                   | Black | <hr/> | <hr/> |
| 11. Outer sheath:                                                                         |       |       |       |
| a- Material                                                                               | HDPE  | <hr/> | <hr/> |
| b- min. thickness, mm                                                                     | 1.5   | <hr/> | <hr/> |
| c- Color                                                                                  | Black | <hr/> | <hr/> |
| d- Conductive Coating (graphite)                                                          | Yes   | <hr/> | <hr/> |
| e- Overall Diameter, mm                                                                   | *     | <hr/> | <hr/> |
| 12. Minimum Permissible bending radius, mm                                                | *     | <hr/> | <hr/> |
| 13. Maximum Permissible pulling force, kN                                                 | *     | <hr/> | <hr/> |
| 14. Ultimate breaking force, kN                                                           | *     | <hr/> | <hr/> |
| 15. Delivery length per drum:                                                             |       |       |       |
| - Standard length (Meter)                                                                 | 2000  | <hr/> | <hr/> |
| - tolerance on length of cable per drum:                                                  | *     | <hr/> | <hr/> |
| 16. Climatic requirements:                                                                |       |       |       |
| a- Operating temperature:                                                                 |       |       |       |
| - Max. (°C)                                                                               | 80    | <hr/> | <hr/> |
| - Min. (°C)                                                                               | -10   | <hr/> | <hr/> |
| b- Relative humidity                                                                      |       |       |       |
| - Max. %                                                                                  | 100   | <hr/> | <hr/> |
| - Min. %                                                                                  | 5     | <hr/> | <hr/> |
| <b>D- PERFORMANCE DATA</b>                                                                |       |       |       |
| 1. Date of first commercial operation                                                     | *     | <hr/> | <hr/> |
| 2. Reference list attached                                                                | Yes   | <hr/> | <hr/> |
| <b>E- SUPPORTING DOCUMENTS</b>                                                            |       |       |       |
| 1. Cable cross-section drawing enclosed                                                   | Yes   | <hr/> | <hr/> |
| 2. Type test reports enclosed                                                             | Yes   | <hr/> | <hr/> |
| 3. Technical literature enclosed                                                          | Yes   | <hr/> | <hr/> |

**F- PACKING SPECIFICATION**

|           |                                                                        |   |       |       |
|-----------|------------------------------------------------------------------------|---|-------|-------|
| 1.        | Length of fiber optic cable reel, m                                    | * | _____ | _____ |
| 2.        | Packing covering                                                       | * | _____ | _____ |
| 3.        | Packing Provisions                                                     | * | _____ | _____ |
| <b>G-</b> | Maximum production capacity of the offered item per month (kilometers) |   | _____ | _____ |

**Note:**

‘A’- Employer’s Specified Data/Parameters

‘B’- Bidder’s Proposed Data/Parameters

‘C’- Remarks Supporting the Proposed Deviation in Column ‘B’

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column ‘B’

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_

**SPECIFIC PLANT DATA FOR  
160kN PORCELAIN DISC INSULATORS**

| Sr.<br>No. | Information Required                                                                                            | 160kN E&M Strength                                                                                   |     |     |
|------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-----|-----|
|            |                                                                                                                 | ‘A’                                                                                                  | ‘B’ | ‘C’ |
| 1.         | Manufacturer’s Name & Address                                                                                   |                                                                                                      |     |     |
| 2.         | Standard Specification Applied                                                                                  | NGC Technical Specifications                                                                         |     |     |
| 3.         | Type of Coupling                                                                                                | Ball & Socket / Tongue & Clevis                                                                      |     |     |
| 4.         | Disc Diameter (mm)                                                                                              | 320/330                                                                                              |     |     |
| 5.         | Disc Spacing (mm)                                                                                               | 170                                                                                                  |     |     |
| 6.         | Insulator shell top surface area (mm)                                                                           | *                                                                                                    |     |     |
| 7.         | Insulator shell Bottom surface area (mm)                                                                        | *                                                                                                    |     |     |
| 8.         | Height of Insulator Shell (measured from base of the cap to lower most rib) (mm)                                | *                                                                                                    |     |     |
| 9.         | Dry Arcing Distance (mm)                                                                                        | *                                                                                                    |     |     |
| 10.        | Min. Creepage Distance (mm)                                                                                     | 545                                                                                                  |     |     |
| 11.        | Creepage Factor                                                                                                 | *                                                                                                    |     |     |
| 12.        | Profile Factor                                                                                                  | *                                                                                                    |     |     |
| 13.        | Minimum Combined Electrical & Mechanical Strength (kN)                                                          | 160                                                                                                  |     |     |
| 14.        | Pattern and sequence of failure for Electro-Mechanical Failing Load Test & Thermal Mechanical Performance Test. | *                                                                                                    |     |     |
| 15.        | Mech. Impact Strength (N-m)                                                                                     | 11.5                                                                                                 |     |     |
| 16.        | Power Frequency Withstand Voltage                                                                               | Dry, kV<br>90<br>Wet, kV<br>50                                                                       |     |     |
| 17.        | Power Frequency Flashover Voltage                                                                               | Dry, kV<br>*<br>Wet, kV<br>*                                                                         |     |     |
| 18.        | Critical Impulse Withstand Voltage 1.2 x 50 $\mu$ s wave                                                        | +ive, kV<br>140<br>-ive, kV<br>140                                                                   |     |     |
| 19.        | Critical Impulse Flashover Voltage 1.2 x 50 $\mu$ s wave                                                        | +ive, kV<br>*<br>-ive, kV<br>*                                                                       |     |     |
| 20.        | Power Frequency Electric Arc Voltage                                                                            | 0.12s/20kA                                                                                           |     |     |
| 21.        | Min. Puncture Voltage in Oil (kV)                                                                               | 130                                                                                                  |     |     |
| 22.        | Radio Influence Voltage                                                                                         | Test voltage to ground (kV)<br>10<br>Max. RIV at 1000 kHz / $\mu$ V<br>50                            |     |     |
| 23.        | Net Weight (kg.)                                                                                                | *                                                                                                    |     |     |
| 24.        | Material                                                                                                        | Shell<br>Porcelain<br>Cap<br>Malleable Cast Iron<br>Forged Steel with 99.95% pure zinc sleeve<br>Pin |     |     |
| 25.        | Standard & Size of Insulator Coupling                                                                           | IEC 60120, Size 20 / IEC 60471 19C                                                                   |     |     |
| 26.        | Standard & Material of Locking Device                                                                           | IEC 60120/ IEC                                                                                       |     |     |



|                                                                                                      |                       |  |  |
|------------------------------------------------------------------------------------------------------|-----------------------|--|--|
|                                                                                                      | 60305, IEC 60372      |  |  |
| 27. Type of galvanizing                                                                              | Hot Dip Galvanization |  |  |
| - Galvanizing for Cap, g/m <sup>2</sup>                                                              | 850                   |  |  |
| - Galvanizing for Pin, g/m <sup>2</sup>                                                              | 770                   |  |  |
| 28. Manufacturer's Catalogue No. of offered Insulators                                               | *                     |  |  |
| 29. All tests, as called for in the Technical Provisions, will be carried out within the quoted cost | Yes                   |  |  |
| 30. Type Test Reports of following tests submitted with the Bid for offered insulators (Yes/No)      |                       |  |  |
| - Thermal Mechanical Performance Test                                                                | *                     |  |  |
| - Power Arc Test                                                                                     | *                     |  |  |
| - Steep Wave Test                                                                                    | *                     |  |  |
| - Artificial Pollution Performance Test                                                              | *                     |  |  |
| 31. Whether Drawing of Insulator submitted                                                           | Yes                   |  |  |
| 32. Color of Porcelain Shell                                                                         | Light Grey            |  |  |
| 33. No. of Anti-Fog Type Insulators with zinc sleeve supplied in past 10 years                       |                       |  |  |
| - Domestic                                                                                           |                       |  |  |
| - Abroad                                                                                             |                       |  |  |
| 34. Packing Provisions                                                                               | *                     |  |  |
| 35. Maximum Production Capacity of 160kN or higher similar Anti-Fog Type Insulators per month (Nos.) | *                     |  |  |

**Note:**

‘A’- Employer's Specified Data/Parameters

‘B’- Bidder's Proposed Data/Parameters

‘C’- Remarks Supporting the Proposed Deviation in Column ‘B’

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column ‘B’

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_

**SPECIFIC PLANT DATA FOR  
80kN PORCELAIN DISC INSULATORS**

| Sr.<br>No. | Information Required                                                                                            | 80kN E&M Strength                                             |                                                                               |     |
|------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------|-----|
|            |                                                                                                                 | 'A'                                                           | 'B'                                                                           | 'C' |
| 1.         | Manufacturer's Name & Address                                                                                   |                                                               |                                                                               |     |
| 2.         | Standard Specification Applied                                                                                  | NGC Technical Specifications                                  |                                                                               |     |
| 3.         | Type of Coupling                                                                                                | Ball & Socket / Tongue & Clevis                               |                                                                               |     |
| 4.         | Disc Diameter (mm)                                                                                              | 254                                                           |                                                                               |     |
| 5.         | Disc Spacing (mm)                                                                                               | 146                                                           |                                                                               |     |
| 6.         | Insulator shell top surface area (mm)                                                                           | *                                                             |                                                                               |     |
| 7.         | Insulator shell Bottom surface area (mm)                                                                        | *                                                             |                                                                               |     |
| 8.         | Height of Insulator Shell (measured from base of the cap to lower most rib) (mm)                                | *                                                             |                                                                               |     |
| 9.         | Dry Arcing Distance (mm)                                                                                        | *                                                             |                                                                               |     |
| 10.        | Min. Creepage Distance (mm)                                                                                     | 432                                                           |                                                                               |     |
| 11.        | Creepage Factor                                                                                                 | *                                                             |                                                                               |     |
| 12.        | Profile Factor                                                                                                  | *                                                             |                                                                               |     |
| 13.        | Minimum Combined Electrical & Mechanical Strength (kN)                                                          | 80                                                            |                                                                               |     |
| 14.        | Pattern and sequence of failure for Electro-Mechanical Failing Load Test & Thermal Mechanical Performance Test. | *                                                             |                                                                               |     |
| 15.        | Mech. Impact Strength (N-m)                                                                                     | 11.5                                                          |                                                                               |     |
| 16.        | Power Frequency Withstand Voltage                                                                               | Dry, kV<br>Wet, kV                                            | 85<br>45                                                                      |     |
| 17.        | Power Frequency Flashover Voltage                                                                               | Dry, kV<br>Wet, kV                                            | *<br>*                                                                        |     |
| 18.        | Critical Impulse Withstand Voltage 1.2 x 50 $\mu$ s wave                                                        | +ive, kV<br>-ive, kV                                          | 125<br>130                                                                    |     |
| 19.        | Critical Impulse Flashover Voltage 1.2 x 50 $\mu$ s wave                                                        | +ive, kV<br>-ive, kV                                          | *<br>*                                                                        |     |
| 20.        | Power Frequency Electric Arc Voltage                                                                            | 0.12s/20kA                                                    |                                                                               |     |
| 21.        | Min. Puncture Voltage in Oil (kV)                                                                               | 130                                                           |                                                                               |     |
| 22.        | Radio Influence Voltage                                                                                         | Test voltage to ground (kV)<br>Max. RIV at 1000 kHz / $\mu$ V | 10<br>50                                                                      |     |
| 23.        | Net Weight (kg.)                                                                                                | *                                                             |                                                                               |     |
| 24.        | Material                                                                                                        | Shell<br>Cap<br>Pin                                           | Porcelain<br>Malleable Cast Iron<br>Forged Steel with 99.95% pure zinc sleeve |     |
| 25.        | Standard & Size of Insulator Coupling                                                                           | IEC 60120, Size 16 / IEC 60471 16C                            |                                                                               |     |
| 26.        | Standard & Material of Locking Device                                                                           | IEC 60120 / IEC                                               |                                                                               |     |

|                                                                                                      |                       |  |  |
|------------------------------------------------------------------------------------------------------|-----------------------|--|--|
|                                                                                                      | 60305, IEC 60372      |  |  |
| 27. Type of galvanizing                                                                              | Hot Dip Galvanization |  |  |
| - Galvanizing for Cap, g/m <sup>2</sup>                                                              | 850                   |  |  |
| - Galvanizing for Pin, g/m <sup>2</sup>                                                              | 770                   |  |  |
| 28. Manufacturer's Catalogue No. of offered Insulators                                               | *                     |  |  |
| 29. All tests, as called for in the Technical Provisions, will be carried out within the quoted cost | Yes                   |  |  |
| 30. Type Test Reports of following tests submitted with the Bid for offered insulators (Yes/No)      |                       |  |  |
| - Thermal Mechanical Performance Test                                                                | *                     |  |  |
| - Power Arc Test                                                                                     | *                     |  |  |
| - Steep Wave Test                                                                                    | *                     |  |  |
| - Artificial Pollution Performance Test                                                              | *                     |  |  |
| 31. Whether Drawing of Insulator submitted                                                           | Yes                   |  |  |
| 32. Color of Porcelain Shell                                                                         | Brown                 |  |  |
| 33. No. of Anti-Fog Type Insulators with zinc sleeve supplied in past 10 years                       |                       |  |  |
| - Domestic                                                                                           |                       |  |  |
| - Abroad                                                                                             |                       |  |  |
| 34. Packing Provisions                                                                               | *                     |  |  |
| 35. Maximum Production Capacity of 80kN or higher similar Anti-Fog Type Insulators per month (Nos.)  | *                     |  |  |

**Note:**

‘A’- Employer's Specified Data/Parameters

‘B’- Bidder's Proposed Data/Parameters

‘C’- Remarks Supporting the Proposed Deviation in Column ‘B’

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column ‘B’

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_

**SPECIFIC PLANT DATA FOR  
160kN GLASS DISC INSULATORS**

| Sr.<br>No. | Information Required                                                                                            | 160kN E&M Strength                                                                                         |     |     |
|------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-----|-----|
|            |                                                                                                                 | ‘A’                                                                                                        | ‘B’ | ‘C’ |
| 1.         | Manufacturer’s Name & Address                                                                                   |                                                                                                            |     |     |
| 2.         | Standard Specification Applied                                                                                  | NGC Technical Specifications                                                                               |     |     |
| 3.         | Type of Coupling                                                                                                | Ball & Socket / Tongue & Clevis                                                                            |     |     |
| 4.         | Disc Diameter (mm)                                                                                              | 320/330                                                                                                    |     |     |
| 5.         | Disc Spacing (mm)                                                                                               | 170                                                                                                        |     |     |
| 6.         | Insulator shell top surface area (mm)                                                                           | *                                                                                                          |     |     |
| 7.         | Insulator shell Bottom surface area (mm)                                                                        | *                                                                                                          |     |     |
| 8.         | Height of Insulator Shell (measured from base of the cap to lower most rib) (mm)                                | *                                                                                                          |     |     |
| 9.         | Dry Arcing Distance (mm)                                                                                        | *                                                                                                          |     |     |
| 10.        | Min. Creepage Distance (mm)                                                                                     | 545                                                                                                        |     |     |
| 11.        | Creepage Factor                                                                                                 | *                                                                                                          |     |     |
| 12.        | Profile Factor                                                                                                  | *                                                                                                          |     |     |
| 13.        | Minimum Combined Electrical & Mechanical Strength (kN)                                                          | 160                                                                                                        |     |     |
| 14.        | Pattern and sequence of failure for Electro-Mechanical Failing Load Test & Thermal Mechanical Performance Test. | *                                                                                                          |     |     |
| 15.        | Mech. Impact Strength (N-m)                                                                                     | 11.5                                                                                                       |     |     |
| 16.        | Power Frequency Withstand Voltage                                                                               | Dry, kV<br>90<br>Wet, kV<br>50                                                                             |     |     |
| 17.        | Power Frequency Flashover Voltage                                                                               | Dry, kV<br>*<br>Wet, kV<br>*                                                                               |     |     |
| 18.        | Critical Impulse Withstand Voltage 1.2 x 50 $\mu$ s wave                                                        | +ive, kV<br>140<br>-ive, kV<br>140                                                                         |     |     |
| 19.        | Critical Impulse Flashover Voltage 1.2 x 50 $\mu$ s wave                                                        | +ive, kV<br>*<br>-ive, kV<br>*                                                                             |     |     |
| 20.        | Power Frequency Electric Arc Voltage                                                                            | 0.12s/20kA                                                                                                 |     |     |
| 21.        | Min. Puncture Voltage in Oil (kV)                                                                               | 130                                                                                                        |     |     |
| 22.        | Radio Influence Voltage                                                                                         | Test voltage to ground (kV)<br>10<br>Max. RIV at 1000 kHz / $\mu$ V<br>50                                  |     |     |
| 23.        | Net Weight (kg.)                                                                                                | *                                                                                                          |     |     |
| 24.        | Material                                                                                                        | Shell<br>Cap<br>Pin<br>Toughened Glass<br>Malleable Cast Iron<br>Forged Steel with 99.95% pure zinc sleeve |     |     |
| 25.        | Standard & Size of Insulator Coupling                                                                           | IEC 60120, Size 20 / IEC 60471 19C                                                                         |     |     |
| 26.        | Standard & Material of Locking Device                                                                           | IEC 60120 / IEC                                                                                            |     |     |

|                                                                                                      |                       |  |  |
|------------------------------------------------------------------------------------------------------|-----------------------|--|--|
|                                                                                                      | 60305, IEC 60372      |  |  |
| 27. Type of galvanizing                                                                              | Hot Dip Galvanization |  |  |
| - Galvanizing for Cap, g/m <sup>2</sup>                                                              | 850                   |  |  |
| - Galvanizing for Pin, g/m <sup>2</sup>                                                              | 770                   |  |  |
| 28. Manufacturer's Catalogue No. of offered Insulators                                               | *                     |  |  |
| 29. All tests, as called for in the Technical Provisions, will be carried out within the quoted cost | Yes                   |  |  |
| 30. Type Test Reports of following tests submitted with the Bid for offered insulators (Yes/No)      |                       |  |  |
| - Thermal Mechanical Performance Test                                                                | *                     |  |  |
| - Power Arc Test                                                                                     | *                     |  |  |
| - Steep Wave Test                                                                                    | *                     |  |  |
| - Artificial Pollution Performance Test                                                              | *                     |  |  |
| 31. Whether Drawing of Insulator submitted                                                           | Yes                   |  |  |
| 32. No. of Anti-Fog Type Insulators with zinc sleeve supplied in past 10 years                       |                       |  |  |
| - Domestic                                                                                           |                       |  |  |
| - Abroad                                                                                             |                       |  |  |
| 33. Packing Provisions                                                                               | *                     |  |  |
| 34. Maximum Production Capacity of 160kN or higher similar Anti-Fog Type Insulators per month (Nos.) | *                     |  |  |

**Note:**

‘A’- Employer's Specified Data/Parameters

‘B’- Bidder's Proposed Data/Parameters

‘C’- Remarks Supporting the Proposed Deviation in Column ‘B’

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column ‘B’

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_

**SPECIFIC PLANT DATA FOR  
80kN GLASS DISC INSULATORS**

| Sr.<br>No. | Information Required                                                                                            | 80kN E&M Strength                                             |                                                                                     |     |
|------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|
|            |                                                                                                                 | 'A'                                                           | 'B'                                                                                 | 'C' |
| 1.         | Manufacturer's Name & Address                                                                                   |                                                               |                                                                                     |     |
| 2.         | Standard Specification Applied                                                                                  | NGC Technical Specifications                                  |                                                                                     |     |
| 3.         | Type of Coupling                                                                                                | Ball & Socket / Tongue & Clevis                               |                                                                                     |     |
| 4.         | Disc Diameter (mm)                                                                                              | 254                                                           |                                                                                     |     |
| 5.         | Disc Spacing (mm)                                                                                               | 146                                                           |                                                                                     |     |
| 6.         | Insulator shell top surface area (mm)                                                                           | *                                                             |                                                                                     |     |
| 7.         | Insulator shell Bottom surface area (mm)                                                                        | *                                                             |                                                                                     |     |
| 8.         | Height of Insulator Shell (measured from base of the cap to lower most rib) (mm)                                | *                                                             |                                                                                     |     |
| 9.         | Dry Arcing Distance (mm)                                                                                        | *                                                             |                                                                                     |     |
| 10.        | Min. Creepage Distance (mm)                                                                                     | 432                                                           |                                                                                     |     |
| 11.        | Creepage Factor                                                                                                 | *                                                             |                                                                                     |     |
| 12.        | Profile Factor                                                                                                  | *                                                             |                                                                                     |     |
| 13.        | Minimum Combined Electrical & Mechanical Strength (kN)                                                          | 80                                                            |                                                                                     |     |
| 14.        | Pattern and sequence of failure for Electro-Mechanical Failing Load Test & Thermal Mechanical Performance Test. | *                                                             |                                                                                     |     |
| 15.        | Mech. Impact Strength (N-m)                                                                                     | 11.5                                                          |                                                                                     |     |
| 16.        | Power Frequency Withstand Voltage                                                                               | Dry, kV<br>Wet, kV                                            | 85<br>45                                                                            |     |
| 17.        | Power Frequency Flashover Voltage                                                                               | Dry, kV<br>Wet, kV                                            | *<br>*                                                                              |     |
| 18.        | Critical Impulse Withstand Voltage 1.2 x 50 $\mu$ s wave                                                        | +ive, kV<br>-ive, kV                                          | 125<br>130                                                                          |     |
| 19.        | Critical Impulse Flashover Voltage 1.2 x 50 $\mu$ s wave                                                        | +ive, kV<br>-ive, kV                                          | *<br>*                                                                              |     |
| 20.        | Power Frequency Electric Arc Voltage                                                                            | 0.12s/20kA                                                    |                                                                                     |     |
| 21.        | Min. Puncture Voltage in Oil (kV)                                                                               | 130                                                           |                                                                                     |     |
| 22.        | Radio Influence Voltage                                                                                         | Test voltage to ground (kV)<br>Max. RIV at 1000 kHz / $\mu$ V | 10<br>50                                                                            |     |
| 23.        | Net Weight (kg.)                                                                                                | *                                                             |                                                                                     |     |
| 24.        | Material                                                                                                        | Shell<br>Cap<br>Pin                                           | Toughened Glass<br>Malleable Cast Iron<br>Forged Steel with 99.95% pure zinc sleeve |     |
| 25.        | Standard & Size of Insulator Coupling                                                                           | IEC 60120, Size 16 / IEC 60471 16C                            |                                                                                     |     |
| 26.        | Standard & Material of Locking Device                                                                           | IEC 60120 / IEC                                               |                                                                                     |     |

|                                                                                                      |                       |  |  |
|------------------------------------------------------------------------------------------------------|-----------------------|--|--|
|                                                                                                      | 60305, IEC 60372      |  |  |
| 27. Type of galvanizing for                                                                          | Hot Dip Galvanization |  |  |
| - Galvanizing for Cap, g/m <sup>2</sup>                                                              | 850                   |  |  |
| - Galvanizing for Pin, g/m <sup>2</sup>                                                              | 770                   |  |  |
| 28. Manufacturer's Catalogue No. of offered Insulators                                               | *                     |  |  |
| 29. All tests, as called for in the Technical Provisions, will be carried out within the quoted cost | Yes                   |  |  |
| 30. Type Test Reports of following tests submitted with the Bid for offered insulators (Yes/No)      |                       |  |  |
| - Thermal Mechanical Performance Test                                                                | *                     |  |  |
| - Power Arc Test                                                                                     | *                     |  |  |
| - Steep Wave Test                                                                                    | *                     |  |  |
| - Artificial Pollution Performance Test                                                              | *                     |  |  |
| 31. Whether Drawing of Insulator submitted                                                           | Yes                   |  |  |
| 32. No. of Anti-Fog Type Insulators with zinc sleeve supplied in past 10 years                       |                       |  |  |
| - Domestic                                                                                           |                       |  |  |
| - Abroad                                                                                             |                       |  |  |
| 33. Packing Provisions                                                                               | *                     |  |  |
| 34. Maximum Production Capacity of 80kN or higher similar Anti-Fog Type Insulators per month (Nos.)  | *                     |  |  |

**Note:**

‘A’- Employer's Specified Data/Parameters

‘B’- Bidder's Proposed Data/Parameters

‘C’- Remarks Supporting the Proposed Deviation in Column ‘B’

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column ‘B’

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_

**SPECIFIC PLANT DATA FOR  
HARDWARE FOR CONDUCTOR, SHIELD WIRE AND OPGW**

| Sr. No. | Information Required                                                                                                     | 'A'                | 'B' | 'C' |
|---------|--------------------------------------------------------------------------------------------------------------------------|--------------------|-----|-----|
| 1.      | Origin of Material<br>(Maker's Name & Address)                                                                           |                    |     |     |
| 2.      | Origin of Hardware<br>(Manufacturer's Name & Address)                                                                    |                    |     |     |
| 3.      | Standard Specification Applied                                                                                           | IEC 61284          |     |     |
| 4.      | Conductor Suspension Clamp                                                                                               |                    |     |     |
|         | a) Vertical Load Withstand Capability, kg                                                                                | 12000              |     |     |
|         | b) Slippage Load (min), kg                                                                                               | 1400               |     |     |
|         | c) Slippage Load (max), kg                                                                                               | 1900               |     |     |
| 5.      | Shield Wire Suspension Clamp                                                                                             |                    |     |     |
|         | a) Slippage Load (max), kg                                                                                               | 900                |     |     |
| 6.      | OPGW Suspension Clamp                                                                                                    |                    |     |     |
|         | a) Vertical Load Withstand Capability, kg                                                                                | 8000               |     |     |
|         | b) Slippage Load (min), kg                                                                                               | 1000               |     |     |
|         | c) Slippage Load (max), kg                                                                                               | 1300               |     |     |
| 7.      | OPGW Tension Clamp                                                                                                       |                    |     |     |
|         | - Slippage Load (min), kg                                                                                                | 95% of UTS of OPGW |     |     |
| 8.      | Shield Wire Tension Clamp                                                                                                |                    |     |     |
|         | - Slippage Load (min), kg                                                                                                | 95% of UTS of SW   |     |     |
| 9.      | Material of Conductor Suspension Clamp compatible with the Conductor Material                                            | Yes                |     |     |
| 10.     | Whether Conductor Hardware assemblies are equipped with suitable corona control and power arc protection devices         | Yes                |     |     |
| 11.     | Whether hardware be corona free during operation                                                                         | Yes                |     |     |
| 12.     | Whether E-field modeling data and its report for conductor hardware strings is submitted                                 | Yes                |     |     |
| 13.     | Corona Extinction Voltage Level for conductor hardware strings, kV rms (L-G)                                             | 346                |     |     |
| 14.     | Galvanizing                                                                                                              |                    |     |     |
|         | a) Type of Galvanizing                                                                                                   | Hot Dip            |     |     |
|         | b) Min. Zinc Coating Thickness (µm)                                                                                      | 86                 |     |     |
| 15.     | Whether conductor hardware strings are suitable for hot-line maintenance                                                 | Yes                |     |     |
| 16.     | Whether conductor hardware is suitable for short circuit current of 63kA for 1 sec                                       | Yes                |     |     |
| 17.     | Whether hardware strings and its components are compliant with the articulation requirements of the Technical Provisions | Yes                |     |     |



|     |                                                                                                                          |                 |       |       |
|-----|--------------------------------------------------------------------------------------------------------------------------|-----------------|-------|-------|
| 18. | Material of Cotter Pin for hardware                                                                                      | Stainless Steel | _____ | _____ |
| 19. | Whether marking of hardware strings and components is according to the Technical Provisions                              | Yes             | _____ | _____ |
| 20. | Whether detailed drawings including isometric views of hardware strings of conductor, Shield wire and OPGW are submitted | Yes             | _____ | _____ |
| 21. | All tests, as called for in the Technical Provisions, will be carried out within the quoted cost                         | Yes             | _____ | _____ |
| 22. | Packing Provisions                                                                                                       | *               | _____ | _____ |

**Note:**

‘A’- Employer’s Specified Data/Parameters

‘B’- Bidder’s Proposed Data/Parameters

‘C’- Remarks Supporting the Proposed Deviation in Column ‘B’

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column ‘B’

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_

**SPECIFIC PLANT DATA FOR  
COMPLETE HARDWARE STRINGS INCLUDING INSULATORS  
(FOR ACSR DRAKE CONDUCTOR)**

| Sr. No. | Information Required                                                                                                          | 'A'                                 | 'B'   | 'C'   |
|---------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|-------|
| 1.      | Power frequency withstand voltage of string with arcing horns, corona control rings/grading rings under wet condition kV(rms) | 680kV                               | _____ | _____ |
| 2.      | Switching surge withstand voltage (wet)                                                                                       |                                     | _____ | _____ |
|         | a) Positive, kV(peak)                                                                                                         | +1300kV                             | _____ | _____ |
|         | b) Negative, kV(peak)                                                                                                         | -1300kV                             | _____ | _____ |
| 3.      | Lightning Impulse withstand voltage (dry)                                                                                     |                                     | _____ | _____ |
|         | a) Positive, kV(peak)                                                                                                         | +2250kV                             | _____ | _____ |
|         | b) Negative, kV(peak)                                                                                                         | -2400kV                             | _____ | _____ |
| 4.      | Min. Impulse flashover voltage (dry) as per IEC-60060-1                                                                       |                                     | _____ | _____ |
|         | a) Positive, kV(peak)                                                                                                         | *                                   | _____ | _____ |
|         | b) Negative, kV(peak)                                                                                                         | *                                   | _____ | _____ |
| 5.      | Minimum Corona extinction voltage under dry condition kV(rms)                                                                 | 346                                 | _____ | _____ |
| 6.      | RIV at 0.5MHz when the string is energized at 346kV (rms) under dry Condition (µV)                                            | 60dB                                | _____ | _____ |
| 7.      | Max. Voltage across any individual insulator in complete insulator assembly (%)                                               | *% for suspension<br>*% for tension | _____ | _____ |
| 8.      | Method/Test for verification of max. voltage across any individual insulator in complete insulator assembly                   | *                                   | _____ | _____ |
| 9.      | Whether drawing of hardware assembly's attachment with the tower showing dimensions and isometric views submitted             | Yes                                 | _____ | _____ |

**Note:**

'A'- Employer's Specified Data/Parameters

'B'- Bidder's Proposed Data/Parameters

'C'- Remarks Supporting the Proposed Deviation in Column 'B'

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column 'B'

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_

**SPECIFIC PLANT DATA FOR  
COMPRESSION TYPE DEAD END  
(FOR ACSR DRAKE CONDUCTOR)**

| Sr. No.   | Information Required                                                               | 'A'                        | 'B' | 'C' |
|-----------|------------------------------------------------------------------------------------|----------------------------|-----|-----|
| <b>A-</b> | <b>GENERAL</b>                                                                     |                            |     |     |
| 1.        | Origin of Material<br>(Maker's Name & Address)                                     |                            |     |     |
| 2.        | Origin of Compression Dead End Body<br>(Manufacturer's Name & Address)             |                            |     |     |
| 3.        | Standard Specification Applied                                                     | IEC 61284                  |     |     |
| 4.        | Failing Load, kg                                                                   | *                          |     |     |
| 5.        | Slipping Load, kg                                                                  | 95% of UTS of<br>Conductor |     |     |
| <b>B-</b> | <b>Steel Compression Dead End</b>                                                  |                            |     |     |
| a)        | Inner Dia, mm                                                                      | *                          |     |     |
| b)        | Outer Dia, mm                                                                      | *                          |     |     |
| c)        | Length before compression, mm                                                      | *                          |     |     |
| d)        | Length after compression, mm                                                       | *                          |     |     |
| e)        | Diameter after compression, mm                                                     | *                          |     |     |
| f)        | Percentage Elongation                                                              | *                          |     |     |
| g)        | Die Size                                                                           | *                          |     |     |
| h)        | Weight, kg                                                                         | *                          |     |     |
| <b>C-</b> | <b>Aluminum Alloy Compression Dead End</b>                                         |                            |     |     |
| a)        | Inner Dia, mm                                                                      | *                          |     |     |
| b)        | Outer Dia, mm                                                                      | *                          |     |     |
| c)        | Length before compression, mm                                                      | *                          |     |     |
| d)        | Length after compression, mm                                                       | *                          |     |     |
| e)        | Diameter after compression, mm                                                     | *                          |     |     |
| f)        | Percentage Elongation                                                              | *                          |     |     |
| g)        | Die Size                                                                           | *                          |     |     |
| h)        | Weight, kg                                                                         | *                          |     |     |
| <b>D-</b> | <b>Jumper Terminal</b>                                                             |                            |     |     |
| a)        | No. of Bolts                                                                       | 4                          |     |     |
| b)        | Material of Bolts, Nuts                                                            | Al. Alloy / St. Steel      |     |     |
| c)        | Material of Spring Washers                                                         | Al. Alloy / St. Steel      |     |     |
| d)        | Material of Plain Washers                                                          | Al. Alloy / St. Steel      |     |     |
| e)        | Material of Belleville Washers                                                     | Al. Alloy / St. Steel      |     |     |
| f)        | Weight, kg                                                                         | *                          |     |     |
| 6.        | Corona extinction voltage, kV rms (L-G)                                            | 346                        |     |     |
| 7.        | Whether the result of Heat Cycle test is provided with the Bid                     | Yes                        |     |     |
| 8.        | Whether the tension Clamps are factory pre-filled with appropriate filler compound | Yes                        |     |     |
| 9.        | Quantity of additional filler compound to be supplied                              | 5% of the total quantity   |     |     |
| 10.       | Protection of open mouths of accessories                                           | Plastic/Rubber Cap         |     |     |

|     |                                                                                                          |         |  |
|-----|----------------------------------------------------------------------------------------------------------|---------|--|
|     | against moisture and dust is ensured with                                                                |         |  |
| 11. | Galvanizing of ferrous material                                                                          |         |  |
|     | a) Type of Galvanizing                                                                                   | Hot Dip |  |
|     | b) Min. Zinc Coating Thickness (µm)                                                                      | 86      |  |
| 12. | Whether hardware is suitable for hot-line maintenance                                                    | Yes     |  |
| 13. | All tests, as called for in the Technical Provisions, will be carried out within the quoted cost         | Yes     |  |
| 14. | Whether drawing of Conductor dead end Joint including its isometric view submitted                       | Yes     |  |
| 15. | Whether marking of compression dead end body and its components is according to the Technical Provisions | Yes     |  |
| 16. | Whether adequate quantity of Electrical Joint Compound Supplied with Compression Dead End Bodies         | Yes     |  |
| 17. | Whether the supplied Electrical Joint Compound is in compliance with the Technical Provisions            | Yes     |  |
| 18. | Packing Provisions                                                                                       | *       |  |

**Note:**

‘A’- Employer’s Specified Data/Parameters

‘B’- Bidder’s Proposed Data/Parameters

‘C’- Remarks Supporting the Proposed Deviation in Column ‘B’

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column ‘B’

Name of Manufacturer:

Signed and Stamped by Manufacturer:

Name of the Bidder:

Signed and Stamped by the Bidder:

**SPECIFIC PLANT DATA FOR  
MID-SPAN JOINT / COMPRESSION SPLICE  
(FOR ACSR DRAKE CONDUCTOR)**

| Sr. No.                         | Information Required                                                                             | 'A'                        | 'B' | 'C' |
|---------------------------------|--------------------------------------------------------------------------------------------------|----------------------------|-----|-----|
| <b>A- GENERAL</b>               |                                                                                                  |                            |     |     |
| 10.                             | Origin of Material<br>(Maker's Name & Address)                                                   |                            |     |     |
| 11.                             | Origin of Compression Splice<br>(Manufacturer's Name & Address)                                  |                            |     |     |
| 12.                             | Standard Specification Applied                                                                   | IEC 61284                  |     |     |
| 13.                             | Failing Load, kg                                                                                 | *                          |     |     |
| 14.                             | Slipping Load, kg                                                                                | 95% of UTS of<br>Conductor |     |     |
| <b>B- Steel Sleeve</b>          |                                                                                                  |                            |     |     |
| a)                              | Inner Dia, mm                                                                                    | *                          |     |     |
| b)                              | Outer Dia, mm                                                                                    | *                          |     |     |
| c)                              | Length before compression, mm                                                                    | *                          |     |     |
| d)                              | Length after compression, mm                                                                     | *                          |     |     |
| e)                              | Diameter after compression, mm                                                                   | *                          |     |     |
| f)                              | Percentage Elongation                                                                            | *                          |     |     |
| g)                              | Die Size                                                                                         | *                          |     |     |
| h)                              | Weight, kg                                                                                       | *                          |     |     |
| <b>C- Aluminum Alloy Sleeve</b> |                                                                                                  |                            |     |     |
| a)                              | Inner Dia, mm                                                                                    | *                          |     |     |
| b)                              | Outer Dia, mm                                                                                    | *                          |     |     |
| c)                              | Length before compression, mm                                                                    | *                          |     |     |
| d)                              | Length after compression, mm                                                                     | *                          |     |     |
| e)                              | Diameter after compression, mm                                                                   | *                          |     |     |
| f)                              | Percentage Elongation                                                                            | *                          |     |     |
| g)                              | Die Size                                                                                         | *                          |     |     |
| h)                              | Weight, kg                                                                                       | *                          |     |     |
| 15.                             | Corona extinction voltage, kV rms (L-G)                                                          | 346                        |     |     |
| 16.                             | Whether the result of Heat Cycle test is provided with the Bid                                   | Yes                        |     |     |
| 17.                             | Whether the accessories are factory pre-filled with appropriate filler compound                  | Yes                        |     |     |
| 18.                             | Quantity of additional filler compound to be supplied                                            | 5% of the total quantity   |     |     |
| 19.                             | Protection of open mouths of accessories against moisture and dust is ensured with               | Plastic/Rubber Cap         |     |     |
| 20.                             | Galvanizing of ferrous material                                                                  |                            |     |     |
| c)                              | Type of Galvanizing                                                                              | Hot Dip                    |     |     |
| d)                              | Min. Zinc Coating Thickness (µm)                                                                 | 86                         |     |     |
| 21.                             | All tests, as called for in the Technical Provisions, will be carried out within the quoted cost | Yes                        |     |     |
| 22.                             | Whether drawing of Mid-Span Joint                                                                | Yes                        |     |     |

|                                        |                                                                            |     |  |
|----------------------------------------|----------------------------------------------------------------------------|-----|--|
| including its isometric view submitted |                                                                            |     |  |
| 23.                                    | Whether marking of Mid-Span Joint is according to the Technical Provisions | Yes |  |
| 24.                                    | Packing Provisions                                                         | *   |  |

**Note:**

- ‘A’- Employer’s Specified Data/Parameters  
‘B’- Bidder’s Proposed Data/Parameters  
‘C’- Remarks Supporting the Proposed Deviation in Column ‘B’  
(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column ‘B’

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_

**SPECIFIC PLANT DATA FOR  
REPAIR SLEEVE  
(FOR ACSR DRAKE CONDUCTOR)**

| Sr. No. | Information Required                                                                             | 'A'                        | 'B' | 'C' |
|---------|--------------------------------------------------------------------------------------------------|----------------------------|-----|-----|
| 1.      | Origin of Material<br>(Maker's Name & Address)                                                   |                            |     |     |
| 2.      | Origin of Repair Sleeve<br>(Manufacturer's Name & Address)                                       |                            |     |     |
| 3.      | Standard Specification Applied                                                                   | IEC 61284                  |     |     |
| 4.      | Inner Dia, mm                                                                                    | *                          |     |     |
| 5.      | Outer Dia, mm                                                                                    | *                          |     |     |
| 6.      | Length before compression, mm                                                                    | *                          |     |     |
| 7.      | Length after compression, mm                                                                     | *                          |     |     |
| 8.      | Diameter after compression, mm                                                                   | *                          |     |     |
| 9.      | Percentage Elongation                                                                            | *                          |     |     |
| 10.     | Die Size                                                                                         | *                          |     |     |
| 11.     | Weight, kg                                                                                       | *                          |     |     |
| 12.     | Material                                                                                         | Al. Alloy                  |     |     |
| 13.     | Failing Load, kg                                                                                 | 95% of UTS of<br>Conductor |     |     |
| 14.     | Corona extinction voltage, kV rms (L-G)                                                          | 346                        |     |     |
| 15.     | Whether the result of Heat Cycle test is provided with the Bid                                   | Yes                        |     |     |
| 16.     | All tests, as called for in the Technical Provisions, will be carried out within the quoted cost | Yes                        |     |     |
| 17.     | Whether drawing of Repair Sleeve Joint including its isometric view submitted                    | Yes                        |     |     |
| 18.     | Whether marking of Repair Sleeve is according to the Technical Provisions                        | Yes                        |     |     |
| 19.     | Packing Provisions                                                                               | *                          |     |     |

**Note:**

'A'- Employer's Specified Data/Parameters

'B'- Bidder's Proposed Data/Parameters

'C'- Remarks Supporting the Proposed Deviation in Column 'B'

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column 'B'

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_

**SPECIFIC GOODS DATA  
FOR  
COMPRESSION SPLICE (FOR EHS GALVANIZED STEEL SHIELDWIRE)**

| Sr. No. | Description                                                                                  | 'A'               | 'B'   | 'C'   |
|---------|----------------------------------------------------------------------------------------------|-------------------|-------|-------|
| 1.      | Manufacturer's name & address                                                                | _____             |       |       |
| 2.      | Material of Sleeve                                                                           | <u>Steel</u>      | _____ | _____ |
| 3.      | Inner Dia, mm                                                                                | <u>*</u>          | _____ | _____ |
| 4.      | Outer Dia, mm                                                                                | <u>*</u>          | _____ | _____ |
| 5.      | Length before compression, mm                                                                | <u>*</u>          | _____ | _____ |
| 6.      | Length after compression, mm                                                                 | <u>*</u>          | _____ | _____ |
| 7.      | Diameter after compression, mm                                                               | <u>*</u>          | _____ | _____ |
| 8.      | Percentage Elongation                                                                        | <u>*</u>          | _____ | _____ |
| 9.      | Slipping Strength, kg                                                                        | <u>95% of UTS</u> | _____ | _____ |
| 10.     | Weight, kg                                                                                   | <u>*</u>          | _____ | _____ |
| 11.     | Whether drawing of shield wire splice submitted                                              | <u>Yes</u>        | _____ | _____ |
| 12.     | All tests, as called in the Technical Provisions, will be carried out within the quoted cost | <u>Yes</u>        | _____ | _____ |

**Note:**

'A'- Employer's Specified Data/Parameters

'B'- Bidder's Proposed Data/Parameters

'C'- Remarks Supporting the Proposed Deviation in Column 'B'

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column 'B'

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_



**SPECIFIC PLANT DATA FOR  
HYDRAULIC COMPRESSORS & DIES**

| Sr. No.   | Information Required                                                               | 'A'           | 'B' | 'C' |
|-----------|------------------------------------------------------------------------------------|---------------|-----|-----|
| <b>A-</b> | <b>100 Ton Hydraulic Compressor</b>                                                |               |     |     |
| 1.        | Origin of Compressor<br>(Manufacturer's Name & Address)                            |               |     |     |
| 2.        | Type of Engine                                                                     | Gasoline      |     |     |
| 3.        | Nominal compressor thrust, tons                                                    | 100           |     |     |
| 4.        | Pressure at which the above stated thrust<br>will be developed, kg/cm <sup>2</sup> | 700           |     |     |
| 5.        | Length of hose pipe, meter                                                         | 10            |     |     |
| 6.        | Pressure gauge and other necessary<br>adaptors fitted with the compressor          | Yes           |     |     |
| 7.        | Dial range of pressure gauge, kg/cm <sup>2</sup>                                   | 0-1000        |     |     |
| 8.        | Fuel capacity of the tank of Engine, liters                                        | *             |     |     |
| 9.        | Total weight of compressor, kg                                                     | *             |     |     |
| 10.       | Total weight of Engine, kg                                                         | *             |     |     |
| 11.       | Working temperature range, °C                                                      | -10°C to 55°C |     |     |
| 12.       | Portable working capability (Yes/No)                                               | *             |     |     |
| 13.       | Compressor suitable for hot-line<br>maintenance work                               | Yes           |     |     |
| 14.       | Remote control operation                                                           | Yes           |     |     |
| 15.       | Ground stand and steel carrying case<br>supplied with the Compressor               | Yes           |     |     |
| 16.       | Product catalogue and drawing submitted                                            | Yes           |     |     |
| 17.       | Packing Provisions                                                                 | *             |     |     |

**Note:**

'A'- Employer's Specified Data/Parameters

'B'- Bidder's Proposed Data/Parameters

'C'- Remarks Supporting the Proposed Deviation in Column 'B'

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column 'B'

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_

**SPECIFIC PLANT DATA FOR  
HYDRAULIC COMPRESSORS & DIES**

| Sr. No.   | Information Required                                                               | ‘A’           | ‘B’ | ‘C’ |
|-----------|------------------------------------------------------------------------------------|---------------|-----|-----|
| <b>B-</b> | <b>60 Ton Hydraulic Compressor</b>                                                 |               |     |     |
| 1.        | Origin of Compressor<br>(Manufacturer’s Name & Address)                            |               |     |     |
| 2.        | Type of Engine                                                                     | Gasoline      |     |     |
| 3.        | Nominal compressor thrust, tons                                                    | 60            |     |     |
| 4.        | Pressure at which the above stated thrust<br>will be developed, kg/cm <sup>2</sup> | 700           |     |     |
| 5.        | Length of hose pipe, meter                                                         | 10            |     |     |
| 6.        | Pressure gauge and other necessary<br>adaptors fitted with the compressor          | Yes           |     |     |
| 7.        | Dial range of pressure gauge, kg/cm <sup>2</sup>                                   | 0-1000        |     |     |
| 8.        | Fuel capacity of the tank of Engine, liters                                        | *             |     |     |
| 9.        | Total weight of compressor, kg                                                     | *             |     |     |
| 10.       | Total weight of Engine, kg                                                         | *             |     |     |
| 11.       | Working temperature range, °C                                                      | -10°C to 55°C |     |     |
| 12.       | Portable working capability (Yes/No)                                               | Yes           |     |     |
| 13.       | Compressor suitable for hot-line<br>maintenance work                               | Yes           |     |     |
| 14.       | Remote control operation                                                           | Yes           |     |     |
| 15.       | Ground stand and steel carrying case<br>supplied with the Compressor               | Yes           |     |     |
| 16.       | Product catalogue and drawing submitted                                            | Yes           |     |     |
| 17.       | Packing Provisions                                                                 | *             |     |     |

**Note:**

‘A’- Employer’s Specified Data/Parameters

‘B’- Bidder’s Proposed Data/Parameters

‘C’- Remarks Supporting the Proposed Deviation in Column ‘B’

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column ‘B’

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_

**SPECIFIC PLANT DATA FOR  
HYDRAULIC COMPRESSORS & DIES**

| Sr. No.   | Information Required                                                                                                                                   | 'A' | 'B' | 'C' |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|
| <b>C-</b> | <b>Compression Dies</b>                                                                                                                                |     |     |     |
| 1.        | Origin of Dies<br>(Manufacturer's Name & Address)                                                                                                      |     |     |     |
| 2.        | One die size required for all conductor accessories                                                                                                    | Yes |     |     |
| 3.        | <b>Dies Sizes for ACSR Drake Conductor</b>                                                                                                             |     |     |     |
| a-        | Compression Dead End Body                                                                                                                              |     |     |     |
| -         | For Aluminum Alloy Part                                                                                                                                | *   |     |     |
| -         | For Steel Part                                                                                                                                         | *   |     |     |
| b-        | Compression Splice/Mid-span Joint                                                                                                                      |     |     |     |
| -         | For Aluminum Alloy Part                                                                                                                                | *   |     |     |
| -         | For Steel Part                                                                                                                                         | *   |     |     |
| c-        | Repair Sleeve                                                                                                                                          |     |     |     |
| -         | For Aluminum Alloy Part                                                                                                                                | *   |     |     |
| 4.        | Whether the Dies for Conductor are compatible with compressor and conductor accessories (indicate separately type of Compressor and corresponding die) | Yes |     |     |
| 5.        | Product catalogue and drawing submitted                                                                                                                | Yes |     |     |
| 6.        | Whether marking of Dies is according to the Technical Provisions                                                                                       | Yes |     |     |
| 7.        | Packing Provisions                                                                                                                                     | *   |     |     |

**Note:**

'A'- Employer's Specified Data/Parameters

'B'- Bidder's Proposed Data/Parameters

'C'- Remarks Supporting the Proposed Deviation in Column 'B'

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column 'B'

Name of Manufacturer:

Signed and Stamped by Manufacturer:

Name of the Bidder:

Signed and Stamped by the Bidder:

**SPECIFIC PLANT DATA FOR  
SPACER DAMPERS  
(FOR ACSR DRAKE CONDUCTOR)**

| Sr. No. | Information Required                                                                                         | 'A'                              | 'B' | 'C' |
|---------|--------------------------------------------------------------------------------------------------------------|----------------------------------|-----|-----|
| 1.      | Manufacturer's Name & Address                                                                                |                                  |     |     |
| 2.      | Standard Specification Applied                                                                               | IEC 61854                        |     |     |
| 3.      | Corona extinction voltage, kV rms (L-G)                                                                      | 346                              |     |     |
| 4.      | Type of damping material                                                                                     | Elastomer                        |     |     |
| 5.      | Dynamic strain caused by vibration at suspension point in vertical direction, micro-strain peak-to-peak      | 200                              |     |     |
| 6.      | Maximum permissible sub-span oscillation amplitude peak to peak (mm)                                         | 130                              |     |     |
| 7.      | Electro-magnetic strength against short circuit current of 63,000 Amps, rms symmetrical for 4 cycles (50 Hz) | 1675 kg                          |     |     |
| 8.      | Spacer Dampers equipped with Break-away head type bolts                                                      | Yes                              |     |     |
| 9.      | Design installation torque for Break-away head bolts with % tolerance, kg-m                                  | *                                |     |     |
| 10.     | Material & size of Breakaway type Bolts                                                                      | M16 Al. Alloy /<br>M12 St. Steel |     |     |
| 11.     | Material of Breakaway head/caps                                                                              | *                                |     |     |
| 12.     | Electrical Resistance between two adjacent Clamps ( $\Omega$ )                                               | *                                |     |     |
| 13.     | Specify temperature withstand capability of elastomer or other non-metallic materials used                   | -10°C to +100°C                  |     |     |
| 14.     | Weight of spacer damper, kg                                                                                  | *                                |     |     |
| 15.     | No. of vibration recorders to be used for field vibration study                                              | Two                              |     |     |
| 16.     | Information regarding locations of spacer damper for various span lengths submitted                          | Yes                              |     |     |
| 17.     | No. of spacer dampers required for ACSR "Drake" Conductor for the following span lengths:                    |                                  |     |     |
|         | 0 - 100m                                                                                                     | *                                |     |     |
|         | 101 - 150m                                                                                                   | *                                |     |     |
|         | 151 - 200m                                                                                                   | *                                |     |     |
|         | 201 - 250m                                                                                                   | *                                |     |     |
|         | 251 - 300m                                                                                                   | *                                |     |     |
|         | 301 - 350m                                                                                                   | *                                |     |     |
|         | 351 - 400m                                                                                                   | *                                |     |     |
|         | 401 - 450m                                                                                                   | *                                |     |     |
|         | 451 - 500m                                                                                                   | *                                |     |     |
|         | 501 - 550m                                                                                                   | *                                |     |     |
|         | 551 - 600m                                                                                                   | *                                |     |     |
|         | 601 - 650m                                                                                                   | *                                |     |     |

|     |                                                                                                                                     |     |  |  |
|-----|-------------------------------------------------------------------------------------------------------------------------------------|-----|--|--|
|     | 651 - 700m                                                                                                                          | *   |  |  |
|     | 701 - 750m                                                                                                                          | *   |  |  |
|     | 751 - 800m                                                                                                                          | *   |  |  |
|     | 801 - 850m                                                                                                                          | *   |  |  |
|     | 851 - 900m                                                                                                                          | *   |  |  |
|     | 901 - 950m                                                                                                                          | *   |  |  |
|     | 951 - 100m                                                                                                                          | *   |  |  |
| 18. | Whether analytical vibration damping study and respective data is submitted                                                         | Yes |  |  |
| 19. | Software used to perform analytical vibration damping study of the proposed damping system                                          | *   |  |  |
| 20. | Whether damping material's characteristics submitted                                                                                | Yes |  |  |
| 21. | Whether installation instructions submitted                                                                                         | Yes |  |  |
| 22. | Whether Spacer Damper is suitable for hot-line maintenance                                                                          | Yes |  |  |
| 23. | Whether Spacer Damper hot-line maintenance procedure submitted                                                                      | Yes |  |  |
| 24. | Whether Spacer Damper is capable of being removed and re-installed without any damage to conductor                                  | Yes |  |  |
| 25. | Whether spacer damper removal and re-installation procedure submitted                                                               | Yes |  |  |
| 26. | Whether the material of Breakaway bolt is resistant to galvanic corrosion due to its possible bimetallic action with damper's clamp | Yes |  |  |
| 27. | Whether marking of Spacer Damper is according to the Technical Provisions                                                           | Yes |  |  |
| 28. | Whether the proposed damping system is in compliant with Performance Requirements of the Technical Provisions                       | Yes |  |  |
| 29. | Whether spacer damper drawing submitted                                                                                             | Yes |  |  |
| 30. | All tests, as called for in the Technical Provisions, will be carried out within the quoted cost                                    | Yes |  |  |
| 31. | Packing Provisions                                                                                                                  | *   |  |  |

**Note:**

‘A’- Employer's Specified Data/Parameters

‘B’- Bidder's Proposed Data/Parameters

‘C’- Remarks Supporting the Proposed Deviation in Column ‘B’

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column ‘B’

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_

**SPECIFIC PLANT DATA FOR  
STOCKBRIDGE VIBRATION DAMPERS  
(FOR ACSR DRAKE CONDUCTOR)**

| Sr. No. | Information Required                                                                                    | 'A'       | 'B' | 'C' |
|---------|---------------------------------------------------------------------------------------------------------|-----------|-----|-----|
| 1.      | Manufacturer's Name & Address                                                                           |           |     |     |
| 2.      | Standard Specification Applied                                                                          | IEC 61897 |     |     |
| 3.      | Vibration Dampers' design criteria (resonance frequencies)                                              | 4R        |     |     |
| 4.      | Corona extinction voltage, kV rms (L-G)                                                                 | 346       |     |     |
| 5.      | Dynamic strain caused by vibration at suspension point in vertical direction, micro-strain peak-to-peak | 200       |     |     |
| 6.      | Vibration Dampers equipped with Break-away head type bolts                                              | Yes       |     |     |
| 7.      | Design installation torque for Break-away head bolts with % tolerance, kg-m                             | *         |     |     |
| 8.      | Material & size of Breakaway type Bolts                                                                 | *         |     |     |
| 9.      | Material of Breakaway head/caps                                                                         | *         |     |     |
| 10.     | Weight of Stockbridge vibration damper, kg                                                              | *         |     |     |
| 11.     | Weight of damper weights, kg                                                                            | *         |     |     |
| 12.     | Material of damper weights                                                                              | *         |     |     |
| 13.     | Material of Clamp                                                                                       | *         |     |     |
| 14.     | Material of Plain & Belleville washers                                                                  | *         |     |     |
| 15.     | Messenger Wire                                                                                          |           |     |     |
|         | a- No. of Strands, min                                                                                  | 19        |     |     |
|         | b- Material                                                                                             | St. Steel |     |     |
| 16.     | No. of vibration recorders to be used for field vibration study                                         | One       |     |     |
| 17.     | Information regarding locations of vibration dampers for various span lengths submitted                 | Yes       |     |     |
| 18.     | No. of vibration dampers required for Aluminum Clad Shield Wire for the following span lengths:         |           |     |     |
|         | 0 - 100m                                                                                                | *         |     |     |
|         | 101 - 200m                                                                                              | *         |     |     |
|         | 201 - 300m                                                                                              | *         |     |     |
|         | 301 - 400m                                                                                              | *         |     |     |
|         | 401 - 500m                                                                                              | *         |     |     |
|         | 501 - 600m                                                                                              | *         |     |     |
|         | 601 - 700m                                                                                              | *         |     |     |
|         | 701 - 800m                                                                                              | *         |     |     |
|         | 801 - 900m                                                                                              | *         |     |     |
|         | 901 - 1000m                                                                                             | *         |     |     |
| 19.     | Whether analytical vibration damping study and respective data is submitted                             | Yes       |     |     |
| 20.     | Software used to perform analytical                                                                     | *         |     |     |

|     |                                                                                                                                     |     |       |       |
|-----|-------------------------------------------------------------------------------------------------------------------------------------|-----|-------|-------|
|     | vibration damping study of the proposed damping system                                                                              |     |       |       |
| 21. | Whether installation instructions submitted                                                                                         | Yes | _____ | _____ |
| 22. | Whether vibration damper is capable of being removed and re-installed without any damage to shield wire                             | Yes | _____ | _____ |
| 23. | Whether vibration damper removal and re-installation procedure submitted                                                            | Yes | _____ | _____ |
| 24. | Whether marking of vibration damper is according to the Technical Provisions                                                        | Yes | _____ | _____ |
| 25. | Whether the proposed damping system is in compliant with Performance Requirements of the Technical Provisions                       | Yes | _____ | _____ |
| 26. | Whether vibration damper drawing submitted                                                                                          | Yes | _____ | _____ |
| 27. | Whether the design of vibration damper is resistant to water and moisture accumulation anywhere on it.                              | Yes | _____ | _____ |
| 28. | Whether the material of Breakaway bolt is resistant to galvanic corrosion due to its possible bimetallic action with damper's clamp | Yes | _____ | _____ |
| 29. | All tests, as called for in the Technical Provisions, will be carried out within the quoted cost                                    | Yes | _____ | _____ |
| 30. | Packing Provisions                                                                                                                  | *   | _____ | _____ |

**Note:**

‘A’- Employer’s Specified Data/Parameters

‘B’- Bidder’s Proposed Data/Parameters

‘C’- Remarks Supporting the Proposed Deviation in Column ‘B’

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column ‘B’

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_

**SPECIFIC PLANT DATA FOR  
STOCKBRIDGE VIBRATION DAMPERS  
(FOR OPGW)**

| Sr. No. | Information Required                                                                                    | 'A'       | 'B' | 'C' |
|---------|---------------------------------------------------------------------------------------------------------|-----------|-----|-----|
| 1.      | Manufacturer's Name & Address                                                                           |           |     |     |
| 2.      | Standard Specification Applied                                                                          | IEC 61897 |     |     |
| 3.      | Vibration Dampers' design criteria (resonance frequencies)                                              | 4R        |     |     |
| 4.      | Dynamic strain caused by vibration at suspension point in vertical direction, micro-strain peak-to-peak | 200       |     |     |
| 5.      | Vibration Dampers equipped with Break-away head type bolts                                              | Yes       |     |     |
| 6.      | Design installation torque for Break-away head bolts with % tolerance, kg-m                             | *         |     |     |
| 7.      | Material & size of Breakaway type Bolts                                                                 | *         |     |     |
| 8.      | Material of Breakaway head/caps                                                                         | *         |     |     |
| 9.      | Weight of Stockbridge vibration damper, kg                                                              | *         |     |     |
| 10.     | Weight of damper weights, kg                                                                            | *         |     |     |
| 11.     | Material of damper weights                                                                              | *         |     |     |
| 12.     | Material of Clamp                                                                                       | *         |     |     |
| 13.     | Material of Plain & Belleville washers                                                                  | *         |     |     |
| 14.     | Messenger Wire                                                                                          |           |     |     |
|         | a- No. of Strands, min                                                                                  | 19        |     |     |
|         | b- Material                                                                                             | St. Steel |     |     |
| 15.     | No. of vibration recorders to be used for field vibration study                                         | One       |     |     |
| 16.     | Information regarding locations of vibration dampers for various span lengths submitted                 | Yes       |     |     |
| 17.     | No. of vibration dampers required for OPGW for the following span lengths:                              |           |     |     |
|         | 0 - 100m                                                                                                | *         |     |     |
|         | 101 - 200m                                                                                              | *         |     |     |
|         | 201 - 300m                                                                                              | *         |     |     |
|         | 301 - 400m                                                                                              | *         |     |     |
|         | 401 - 500m                                                                                              | *         |     |     |
|         | 501 - 600m                                                                                              | *         |     |     |
|         | 601 - 700m                                                                                              | *         |     |     |
|         | 701 - 800m                                                                                              | *         |     |     |
|         | 801 - 900m                                                                                              | *         |     |     |
|         | 901 - 1000m                                                                                             | *         |     |     |
| 18.     | Whether analytical vibration damping study and respective data is submitted                             | Yes       |     |     |
| 19.     | Software used to perform analytical vibration damping study of the proposed damping system              | *         |     |     |



|                                                                                                                                         |     |       |       |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----|-------|-------|
| 20. Whether installation instructions submitted                                                                                         | Yes | _____ | _____ |
| 21. Whether vibration damper is capable of being removed and re-installed without any damage to OPGW                                    | Yes | _____ | _____ |
| 22. Whether vibration damper removal and re-installation procedure submitted                                                            | Yes | _____ | _____ |
| 23. Whether marking of vibration damper is according to the Technical Provisions                                                        | Yes | _____ | _____ |
| 24. Whether the proposed damping system is in compliant with Performance Requirements of the Technical Provisions                       | Yes | _____ | _____ |
| 25. Whether vibration damper drawing submitted                                                                                          | Yes | _____ | _____ |
| 26. Whether the design of vibration damper is resistant to water and moisture accumulation anywhere on it.                              | Yes | _____ | _____ |
| 27. Whether the material of Breakaway bolt is resistant to galvanic corrosion due to its possible bimetallic action with damper's clamp | Yes | _____ | _____ |
| 28. All tests, as called for in the Technical Provisions, will be carried out within the quoted cost                                    | Yes | _____ | _____ |
| 29. Packing Provisions                                                                                                                  | *   | _____ | _____ |

**Note:**

‘A’- Employer’s Specified Data/Parameters

‘B’- Bidder’s Proposed Data/Parameters

‘C’- Remarks Supporting the Proposed Deviation in Column ‘B’

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column ‘B’

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_

**SPECIFIC GOODS DATA  
FOR  
STOCKBRIDGE VIBRATION DAMPERS FOR SHIELD WIRE**

| Sr.<br>No. | Description | 9.15 mm EHS Shield Wire<br>Designated as SB-EHS |     |     |
|------------|-------------|-------------------------------------------------|-----|-----|
|            |             | 'A'                                             | 'B' | 'C' |

1. Manufacturer's name and address \_\_\_\_\_
2. Information regarding locations of dampers for various span lengths submitted Yes \_\_\_\_\_

No. of vibration dampers required for EHS Shield Wire for following span lengths:

|              |       |       |       |
|--------------|-------|-------|-------|
| 0 - 100 m    | _____ | _____ | _____ |
| 101 - 200 m  | _____ | _____ | _____ |
| 201 - 300 m  | _____ | _____ | _____ |
| 301 - 350 m  | _____ | _____ | _____ |
| 351 - 380 m  | _____ | _____ | _____ |
| 381 - 390 m  | _____ | _____ | _____ |
| 391 - 400 m  | _____ | _____ | _____ |
| 401 - 450 m  | _____ | _____ | _____ |
| 451 - 500 m  | _____ | _____ | _____ |
| 501 - 550 m  | _____ | _____ | _____ |
| 551 - 600 m  | _____ | _____ | _____ |
| 601 - 700 m  | _____ | _____ | _____ |
| 701 - 800 m  | _____ | _____ | _____ |
| 801 - 900 m  | _____ | _____ | _____ |
| 901 - 1000 m | _____ | _____ | _____ |

| Sr. No. | Description                                                                                            | 9.15 mm EHS Shield Wire<br>Designated as SB-EHS  |       |       |
|---------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|-------|
|         |                                                                                                        | 'A'                                              | 'B'   | 'C'   |
| 4.      | Dynamic strain caused by vibration at _____<br>suspension point in vertical direction,<br>micro-strain | <u>600 micro m/m</u>                             | _____ | _____ |
|         |                                                                                                        | <u>peak-to-peak</u>                              |       |       |
| 5.      | Vibration dampers equipped<br>with breakaway type bolts                                                | <u>Yes</u>                                       | _____ | _____ |
| 6.      | Material of Breakaway type Bolt                                                                        | <u>Aluminum Alloy/<br/>stainless steel</u>       | _____ | _____ |
| 7.      | Size of Breakaway type Bolt <u>*</u>                                                                   | _____                                            | _____ | _____ |
| 8.      | All tests, as called for in the Technical<br>Provisions, will be carried out<br>within the quoted cost | <u>Yes</u>                                       | _____ | _____ |
| 9.      | No. of vibration recorders to be used<br>for vibration study                                           | <u>One</u>                                       | _____ | _____ |
| 10.     | Whether Stockbridge vibration damper<br>drawing submitted                                              | <u>Yes</u>                                       | _____ | _____ |
| 11.     | Weight of Damper, kg                                                                                   | <u>*</u>                                         | _____ | _____ |
| 12.     | Material of Damper weights                                                                             | <u>*</u>                                         | _____ | _____ |
| 13.     | Material of Clamp                                                                                      | <u>*</u>                                         | _____ | _____ |
| 14.     | Material of Plain & Belleville,<br>Washers                                                             | <u>*</u>                                         | _____ | _____ |
| 15.     | Design Installation torque for<br>Break-away head bolts, kg-m                                          | <u>*</u>                                         | _____ | _____ |
| 16.     | Material & No. of Strands of<br>Messenger Wire                                                         | <u>Stainless Steel</u><br><u>&amp;min 19 Nos</u> | _____ | _____ |
| 17.     | Packing Provisions                                                                                     | <u>*</u>                                         | _____ | _____ |

**Note:**

'A'- Employer's Specified Data/Parameters

'B'- Bidder's Proposed Data/Parameters

'C'- Remarks Supporting the Proposed Deviation in Column 'B'

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column 'B'

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_

**SPECIFIC PLANT DATA FOR  
GROUNDING MATERIAL**

| Sr. No. | Description                                      | 'A'                                 | 'B'   | 'C'   |
|---------|--------------------------------------------------|-------------------------------------|-------|-------|
| 1.      | Manufacturer's name & address                    | _____                               |       |       |
| 2.      | Copper-weld/Copper-covered Ground Rod            |                                     |       |       |
| i)      | Origin of material<br>(Maker's Name and Address) | _____                               | _____ | _____ |
| ii)     | Standard Specification applied                   | ANSI/UL 467<br><u>Standards</u>     | _____ | _____ |
| iii)    | Tensile strength, kg/mm <sup>2</sup>             | <u>41-56</u>                        | _____ | _____ |
| iv)     | Yield strength (min), kg/mm <sup>2</sup>         | <u>25</u>                           | _____ | _____ |
| v)      | Elongation, %                                    | 20% in 200mm<br><u>Gauge length</u> | _____ | _____ |
|         | _____                                            |                                     |       |       |
| vi)     | Method used to cover steel by copper             |                                     |       |       |
|         | - Molten Welding                                 | <u>*</u>                            | _____ | _____ |
|         | - Copper bonded (electro deposited)              | <u>*</u>                            | _____ | _____ |
| vii)    | Dia. of rod, mm                                  | <u>16</u>                           | _____ | _____ |
| viii)   | Length of Rod, m                                 | <u>3</u>                            | _____ | _____ |
| ix)     | Thickness of Copper                              |                                     |       |       |
|         | - Copper Weld, mm                                | <u>0.38</u>                         | _____ | _____ |
|         | - Copper Cover, mm                               | <u>0.45</u>                         | _____ | _____ |
| x)      | Packing                                          |                                     |       |       |
|         | a) No. of rods in each box                       | <u>*</u>                            | _____ | _____ |
|         | b) Net weight, kg                                | <u>*</u>                            | _____ | _____ |
|         | c) Gross weight, kg                              | <u>*</u>                            | _____ | _____ |
| 3.      | Grounding connectors                             |                                     |       |       |
| i)      | Standard Specification applied                   | ANSI/UL 467<br><u>Standards</u>     | _____ | _____ |

| Sr. No. | Description                                         | 'A'                                               | 'B' | 'C' |
|---------|-----------------------------------------------------|---------------------------------------------------|-----|-----|
| ii)     | Material used                                       |                                                   |     |     |
|         | a) Flat to cable connector                          | Hot dipped<br><u>galvanized steel</u>             |     |     |
|         | b) Cable to rod connector                           | Bronze or<br>high strength<br><u>copper alloy</u> |     |     |
| iii)    | Tightening torque<br>(withstand without damage)     | <u>*</u>                                          |     |     |
| iv)     | Size of screw of flat to cable<br>connector         | <u>M16</u>                                        |     |     |
| v)      | Whether drawing of grounding<br>connector submitted | <u>Yes</u>                                        |     |     |
| vi)     | Packing                                             |                                                   |     |     |
|         | a) No. of connectors in each box                    | <u>*</u>                                          |     |     |
|         | b) Net weight, kg                                   | <u>*</u>                                          |     |     |
|         | c) Gross weight, kg                                 | <u>*</u>                                          |     |     |
| 4.      | Copper-covered/Copper-weld stranded ground wire     |                                                   |     |     |
| i)      | Origin of material<br>(Maker's Name and Address)    |                                                   |     |     |
| ii)     | Standard Provisions applied                         | <u>ASTM B227/B228</u>                             |     |     |
| iii)    | No. of strands                                      | <u>07</u>                                         |     |     |
| iv)     | Dia. of each strand, mm                             | <u>2.59</u>                                       |     |     |
| vi)     | Dia. of complete wire, mm                           | <u>7.77</u>                                       |     |     |
| vii)    | %age conductivity                                   | <u>40</u>                                         |     |     |
| viii)   | Packing                                             |                                                   |     |     |
|         | a) Length of wire in each reel, m                   | <u>2000</u>                                       |     |     |
|         | b) Net weight, kg                                   | <u>*</u>                                          |     |     |
|         | c) Gross weight, kg                                 | <u>*</u>                                          |     |     |



**SPECIFIC PLANT/GOODS DATA FOR  
RTV SILICONE RUBBER INSULATOR COATING**

| Sr. No. | Description | ‘A’ | ‘B’ | ‘C’ |
|---------|-------------|-----|-----|-----|
|---------|-------------|-----|-----|-----|

1. (i) Manufacturer’s Name & Address: \_\_\_\_\_  
(ii) Applicator’s Name & Address: \_\_\_\_\_
2. Standards Followed \_\_\_\_\_

**RATINGS:**

- |     |                                                                                           |                                             |       |       |
|-----|-------------------------------------------------------------------------------------------|---------------------------------------------|-------|-------|
| 3.  | Method of application                                                                     | Dip / Spray                                 | _____ | _____ |
| 4.  | Use of Primer for adhesion                                                                | Forbidden                                   | _____ | _____ |
| 5.  | Type of Coating                                                                           | One-Part, RTV                               | _____ | _____ |
| 6.  | Appearance                                                                                | Paint                                       | _____ | _____ |
| 7.  | Specific Gravity                                                                          | 1.10-1.25                                   | _____ | _____ |
| 8.  | Color of Coating (White/Gray/Blue or any other subject to Consultant/Engineer’s approval) | *                                           | _____ | _____ |
| 9.  | Application Temperature Range, ° C                                                        | 0°--50°C                                    | _____ | _____ |
| 10. | Skin-over time at Standard Conditions, minutes                                            | 15                                          | _____ | _____ |
| 11. | Track free time at Standard Conditions, minutes                                           | 15-45                                       | _____ | _____ |
| 12. | Percent Solids by weight, %                                                               | ≥ 70                                        | _____ | _____ |
| 13. | Dynamic Viscosity. cP (centipoise)                                                        | 1000-3500                                   | _____ | _____ |
| 14. | Dielectric Strength, V/mil (ASTM D149)                                                    | 350-560                                     | _____ | _____ |
| 15. | Volume Resistivity. Ohm.cm (ASTM D257)                                                    | 1x10 <sup>14</sup> –<br>37x10 <sup>14</sup> | _____ | _____ |
| 16. | Dissipation Factor at 100 Hz (ASTM D150)                                                  | 0.01-0.09                                   | _____ | _____ |
| 17. | Tracking Wheel Withstand, hours                                                           | 1000                                        | _____ | _____ |
| 18. | Receding Water Contact Angle. degrees, minimum                                            | ≥80                                         | _____ | _____ |

**Material**



|                                            |                                                                                        |           |       |       |
|--------------------------------------------|----------------------------------------------------------------------------------------|-----------|-------|-------|
| 19.                                        | Dry Arc Resistance, Seconds                                                            | 180-200   | _____ | _____ |
| 20.                                        | Reinforcing Filler                                                                     | *         | _____ | _____ |
| 21.                                        | Alumina Trihydrate (ATH) Content                                                       | *         | _____ | _____ |
| 22.                                        | UV Absorbent                                                                           | *         | _____ | _____ |
| 23.                                        | Condensation Catalyst                                                                  | *         | _____ | _____ |
| 24.                                        | Adhesion Promoter                                                                      | *         | _____ | _____ |
| 25.                                        | Longevity (Service Life), years                                                        | *         | _____ | _____ |
| <b>Material Consumption per insulator:</b> |                                                                                        |           |       |       |
| 26.                                        | Quantity of RTV coating required for one 80kN Fog Type Disc Insulator, kg, maximum     | *         | _____ | _____ |
| 27.                                        | Quantity of RTV coating required for one 160kN Normal Type Disc Insulator, kg, maximum | *         | _____ | _____ |
| <b>Composition and Properties:</b>         |                                                                                        |           |       |       |
| 28.                                        | Dry Film Thickness (DFT), mm, minimum                                                  | 0.38-0.50 | _____ | _____ |
| 29.                                        | Tolerance (±) of DFT, mm                                                               | *         | _____ | _____ |
| 30.                                        | Wet Film Thickness                                                                     | *         | _____ | _____ |
| 31.                                        | No. of Coats to achieve DFT                                                            | *         | _____ | _____ |
| 32.                                        | Shelf life, months                                                                     | 12        | _____ | _____ |
| 33.                                        | No Flashover Warranty, Years                                                           | 10        | _____ | _____ |
| 34.                                        | Recommended Dew Point Temperature Difference Range, °C                                 | *         | _____ | _____ |
| <b>TYPE TESTS</b>                          |                                                                                        |           |       |       |
| 35.                                        | Inclined Plane Tracking & Erosion Test as per IEC 60587                                | Yes       | _____ | _____ |
| 36.                                        | Accelerated Weathering Test (1000 Hours) as per IEC 61109                              | Yes       | _____ | _____ |
| 37.                                        | Artificial Pollution Test by Salt Fog Method as per IEC 60507                          | Yes       | _____ | _____ |
| 38.                                        | Angle of Hydrophobicity as per IEC TS 62073                                            | Yes       | _____ | _____ |

|     |                                                    |     |       |       |
|-----|----------------------------------------------------|-----|-------|-------|
| 39. | Hydrophobicity Recovery by Corona Test Method      | Yes | _____ | _____ |
| 40. | Dry Arc Resistance as per ASTM D495                | Yes | _____ | _____ |
| 41. | Dielectric Strength Test as per ASTM D149a         | Yes | _____ | _____ |
| 42. | Volume & Surface Resistivity Test as per ASTM D257 | Yes | _____ | _____ |
| 43. | Dissipation Factor Test as per ASTM D150           | Yes | _____ | _____ |

**Note:**

‘A’- Employer’s Specified Data/Parameters

‘B’- Bidder’s Proposed Data/Parameters

‘C’- Remarks Supporting the Proposed Deviation in Column ‘B’

(\*)- Data/Parameter to be Provided/Proposed by the Bidder in Column ‘B’

Name of Manufacturer: \_\_\_\_\_

Signed and Stamped by Manufacturer: \_\_\_\_\_

Name of the Bidder: \_\_\_\_\_

Signed and Stamped by the Bidder: \_\_\_\_\_

**SCHEDULE - B TO BID****PROPOSED ORGANIZATION FOR THE PROJECT & WORK  
METHODOLOGY****FORM 1: SITE ORGANIZATION & METHOD STATEMENT**

In this form, bidder shall provide the ITS Organization Chart indicating all positions that will be employed in Head Office, Site Office, etc. for the works to be done under the contract. Bidder shall also mention the job description of each key position.

The Bidder shall also provide experience record of the following proposed key personnel in Schedule D to bid.

| <b>Sr. No.</b> | <b>Position</b>                         | <b>Total Work Experience (years)</b> | <b>Experience in Similar Works (years)</b> | <b>No. of Key Persons for Each Lot</b> |
|----------------|-----------------------------------------|--------------------------------------|--------------------------------------------|----------------------------------------|
| 1              | Project Manager <sup>1</sup>            | 15                                   | 10                                         | 1                                      |
| 2              | Procurement Specialist                  | 10                                   | 5                                          | 1                                      |
| 3              | Design Team Leader <sup>1</sup>         | 10                                   | 5                                          | 1                                      |
| 4              | Construction Manager <sup>1</sup>       | 10                                   | 5                                          | 1                                      |
| 5              | Site Engineer (Civil) <sup>1</sup>      | 5                                    | 3                                          | 1                                      |
| 6              | Site Engineer (Electrical) <sup>1</sup> | 5                                    | 3                                          | 1                                      |
| 7              | Testing & Commissioning Engineer        | 10                                   | 8                                          | 1                                      |
| 8              | Environmental/HSE Officer <sup>2</sup>  | 8                                    | 3                                          | 1                                      |

<sup>1</sup> The above personnel shall be graduate Engineer minimum.

<sup>2</sup> Environmental/HSE Officer shall be graduate (16 years education) in Environmental Sciences / Environmental Engineering. He/She should also have OSHA/NEBOSH certification with 03 years of professional experience in project implementation.

The Bidder is required to submit a narrative outlining the method of performing the Works. The narrative should indicate in detail and include but not be limited to:

- The sequence and methods in which the bidder proposes to carry out the Works, including the number of shifts per day and hours per shift, he expects to work.
- The procedure for installation/erection of equipment and transportation of equipment and materials to the site.
- The Contractor shall provide description of his construction camp's facilities and staff housing requirements.

- The Contractor shall be responsible for pumps, electrical power, water and electrical distribution systems, and sewerage system including all fittings, pipes and other items necessary for servicing the Contractor's construction camp and staff housing facilities. The Bidder shall list or explain his plans for providing these facilities for the service of the Contract as follows:
  1. Site Preparation (clearing, land preparation, etc.).
  2. Provision of Services.
    - a) Power (expected power load, etc.).
    - b) Water (required amount and system proposed).
    - c) Sanitation (sewage disposal system, etc.).
  3. Construction of Facilities
    - a) Contractor's Office, Workshop and Work Areas (areas required and proposed layout, type of construction of buildings, etc.).
    - b) Warehouses and Storage Areas (area required, type of construction and layout).
    - c) Housing and Staff Facilities (Plans for housing for proposed staff, layout, type of construction, etc.)
  4. Construction Equipment Assembly and Preparation (detailed plans for carrying out this activity).
  5. Other Items Proposed (Security services, etc.).

Initials of Signatory to Bid:.....

**SCHEDULE - B TO BID**

**FORM 2: MOBILIZATION SCHEDULE**

In this form, the bidder shall provide details regarding mobilization of its team in Pakistan along with detailed timeline in accordance with Construction Schedule (Schedule C to Bid).

Initials of Signatory to Bid:.....

**SCHEDULE - C TO BID****CONSTRUCTION SCHEDULE**

- 1) Bidder shall provide a Construction Schedule in a bar-chart/CPM/PERT form showing the sequence of work items by which he proposes to complete the work of the entire Contract. The Schedule should indicate the sequence of work items and the period of time during which he proposes to complete the Works including the activities like designing, schedule of submittal of drawings, ordering and procurement of materials, manufacturing, delivering, design and construction of civil works, erection, testing and commissioning of Works to be supplied under the Contract. It shall include but not limited to the following:

| Sr. No. | Description of Work                                                                           | Period in months from the effective date of contract |
|---------|-----------------------------------------------------------------------------------------------|------------------------------------------------------|
| 1.      | Completion of detailed Engineering and drawing submission<br>a) Commencement<br>b) Completion |                                                      |
| 2.      | Procurement of equipment/components & assembly<br>a) Commencement<br>b) Completion            |                                                      |
| 3.      | Manufacturing<br>a) Commencement<br>c) Completion                                             |                                                      |
| 3.      | Type Tests<br>a) Commencement<br>b) Completion                                                |                                                      |
| 5.      | Shipments & Delivery<br>a) Commencement<br>b) Completion                                      |                                                      |
| 6.      | Establishment of site office                                                                  |                                                      |
| 7.      | Erection of towers<br>a) Commencement<br>b) Completion                                        |                                                      |
| 8.      | Testing & Pre-commissioning<br>a) Commencement<br>c) Completion                               |                                                      |
| 9.      | b) Commissioning                                                                              |                                                      |

To provide the accumulative effective of the activities per month, the bidder shall also provide the graph/ chart as following:

| Sr. No. | Description                            | Days (Months) |    |    |     |     |          |
|---------|----------------------------------------|---------------|----|----|-----|-----|----------|
|         |                                        | 30            | 60 | 90 | 120 | 150 | -----600 |
| 1.      | Signing of contract                    |               |    |    |     |     |          |
| 2.      | Effective Date                         |               |    |    |     |     |          |
| 3.      | Mobilization                           |               |    |    |     |     |          |
| 4.      | Survey & Soil investigation            |               |    |    |     |     |          |
| 5.      | Engineering & Design                   |               |    |    |     |     |          |
| 6.      | Manufacturing & Shipment               |               |    |    |     |     |          |
| 7.      | Civil Works (Foundations)              |               |    |    |     |     |          |
| 8.      | Erection of Towers                     |               |    |    |     |     |          |
| 9.      | Stringing of Conductor                 |               |    |    |     |     |          |
| 10.     | OPGW Splicing, testing & commissioning |               |    |    |     |     |          |

The proposed program of Works shall base on the Schedule of Implementation (**20 months**) as per Bidding Documents.

- 2) The bidder shall indicate the construction crews employed to achieve the completion target for the following:

| Type of Crews   | No. of Crew employed | Expected Progress/month/crew* |
|-----------------|----------------------|-------------------------------|
| Foundation Crew |                      |                               |
| Erection Crew   |                      |                               |
| Stringing Crew  |                      |                               |

\* Mention the required time per tower of a crew to complete a certain activity e.g., foundation etc.

Initials of Signatory to Bid:.....

SCHEDULE - D TO BID

PERSONNEL

FORM PER-1: PROPOSED PERSONNEL

Bidders should provide the details of proposed personnel and their experience record in the relevant Information Forms below for each of the candidate along with recent color photograph.

|      |                    |
|------|--------------------|
| 1.   | Title of position* |
|      | Name               |
| 2.   | Title of position* |
|      | Name               |
| 3.   | Title of position* |
|      | Name               |
| 4.   | Title of position* |
|      | Name               |
| etc. | Title of position* |
|      | Name               |

- Note -

\*As listed in Technical Provisions

Initials of Signatory to Bid:.....



**Form PER – 2: Resume of Proposed Personnel**

The Bidder shall provide all the information requested below along with recent color photograph. Use one form for each position.

|                              |                                    |                                            |
|------------------------------|------------------------------------|--------------------------------------------|
| <b>Position</b>              |                                    |                                            |
| <b>Personnel information</b> | <b>Name</b>                        | <b>Date of birth</b>                       |
|                              | <b>Professional qualifications</b> |                                            |
| <b>Present employment</b>    | <b>Name of employer</b>            |                                            |
|                              | <b>Address of employer</b>         |                                            |
|                              | <b>Telephone</b>                   | <b>Contact (manager/personnel officer)</b> |
|                              | <b>Fax</b>                         | <b>E-mail</b>                              |
|                              | <b>Job title</b>                   | <b>Years with present employer</b>         |

Summarize professional experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

| From | To | Company/Project/Position/Relevant Technical and Management Experience |
|------|----|-----------------------------------------------------------------------|
|      |    |                                                                       |
|      |    |                                                                       |
|      |    |                                                                       |
|      |    |                                                                       |
|      |    |                                                                       |
|      |    |                                                                       |
|      |    |                                                                       |
|      |    |                                                                       |
|      |    |                                                                       |
|      |    |                                                                       |

**SCHEDULE - E TO BID****SUBCONTRACTORS****Form SUBCON: Proposed Subcontractors/Manufacturers for Major Items of Plant and Services**

The following Subcontractors and/or manufacturers are proposed for carrying out the item of the facilities indicated. Bidder shall not propose more than two manufacturers for any major item.

**Major equipment/Items of Plant to be supplied**

| Sr. # | Name of Equipment/ Material                                    | Name of Manufacturer | Nationality of Manufacturer | Type/ Designation of proposed Equipment/ Material | Name of Type Testing Laboratory | Type Test Report No. |
|-------|----------------------------------------------------------------|----------------------|-----------------------------|---------------------------------------------------|---------------------------------|----------------------|
| 1.    | 500 kV Steel Towers                                            |                      |                             |                                                   |                                 |                      |
| 2.    | ACSR Drake Conductor & Shieldwire                              |                      |                             |                                                   |                                 |                      |
| 3.    | OPGW & Accessories                                             |                      |                             |                                                   |                                 |                      |
| 4.    | Insulator Hardware Assemblies (with Pre-RTV coated insulators) |                      |                             |                                                   |                                 |                      |
| 5.    | Hardware for OPGW & Shieldwire                                 |                      |                             |                                                   |                                 |                      |
| 6.    | Transmission Line Hardware Accessories and Dampers             |                      |                             |                                                   |                                 |                      |
| 7.    | Grounding Material for Overhead Transmission Lines             |                      |                             |                                                   |                                 |                      |

**Note:**

1. The list given above is tentative. Bidder shall provide the list of all material it is offering along with complete information of manufacturers/ subcontractors.
2. The final selection of the Subcontractor/ Manufacturer for each equipment shall be at the discretion of the Employer.
3. No change of Sub-Contractor shall be made by the Bidder without prior approval of the Employer.
4. The truthfulness and accuracy of the statement as to the experience of Subcontractors is guaranteed by the Bidder. The Employer's judgment shall be final as to the evaluation of the experience of Subcontractors submitted by the Bidder.

5. Statement of similar works shall include description, location & value of work, year completed and name & address of the clients.
6. This may include manufacturer(s) who are proposed here and their relevant details to be provided accordingly including make, capacity and salient features to make it particularly suitable for the works. The technology used should also be detailed adequately.
7. All other equipment/material not mentioned above shall be supplied in accordance with requirements mentioned in Volume-II: Technical Provisions of tender document and relevant NGC specification. The approval of the same shall be sought at detail design stage. In this context the successful bidder shall submit at least two (02) names of manufacturer/subcontractors for the equipment/material not mentioned above for approval by the engineer.

Name of Bidder \_\_\_\_\_

Signatures of the bidder \_\_\_\_\_

SCHEDULE - F TO BID

Country of Origin Declaration Form

Name of Bidder \_\_\_\_\_ Tender Number \_\_\_\_\_ Page \_\_\_\_ of \_\_\_\_

| Item | Description | Country of Origin |
|------|-------------|-------------------|
|      |             |                   |
|      |             |                   |
|      |             |                   |
|      |             |                   |
|      |             |                   |

**SCHEDULE - G-1 TO BID**

**DEVIATIONS  
FROM TECHNICAL PROVISIONS**

It is presumed that the bidder shall not take any deviation. However, if he intends to take deviations to the specified technical provisions, those must be listed in the space provided below:

| Sr. No. | Clause No. / Section No. | Deviations/Clarifications |
|---------|--------------------------|---------------------------|
|---------|--------------------------|---------------------------|

[Note: Attach additional sheets, if necessary]

Initials of Signatory to Bid:.....

**SCHEDULE - G-2 TO BID**

**DEVIATIONS  
FROM CONTRACTUAL CONDITIONS**

It is presumed that the bidder shall not take any deviation. However, if he intends to take deviations to the specified Contractual/Commercial Conditions, those must be listed in the space provided below:

| Sr. No. | Clause No. / Section No. | Deviations/Clarifications |
|---------|--------------------------|---------------------------|
|---------|--------------------------|---------------------------|

Note: Attach additional sheets, if necessary

Initials of Signatory to Bid:.....

**SCHEDULE -H TO BID****JV AGREEMENT**

THIS LETTER OF INTENT signed on this..... Day of..... Two Thousand and ..... by..... A company incorporated under the laws of ..... and having its Registered Office at ..... (hereinafter called the "Party No.1" which expression shall include its successors, executors and permitted assigns) and M/s.....a company incorporated under the laws of..... and having its Registered Office at..... (hereinafter called the "Party No.2" which expression shall include its successors, executors and permitted assigns) and M/s..... .. a Company incorporated under the laws of..... and having its Registered Office at..... (hereinafter called the "Party No.3" which expression shall include its successors, executors and permitted assigns) for the purpose of making a bid and entering into a contract [hereinafter called the "Contract" {in case of award)] against the Specification No.....for \_\_\_\_\_ associated with \_\_\_\_\_ of ..... (hereinafter called the "**Employer**").

WHEREAS the Party No.1, Party No.2 and Party No.3 intend to enter into a Joint Venture Agreement

AND WHEREAS the Employer invited bids as per the above mentioned Specification for the design, manufacture, Supply of Equipment Materials stipulated in the bidding documents under \_\_\_\_\_ (Lot #) \_\_\_\_\_ associated with \_\_\_\_\_.

AND WHEREAS Clause 2, Section-ITB and 'Qualification & Evaluation Requirement of the Bidder'(clause 13, 24 & 25 of ITB), and technical provisions forming part of the bidding documents, inter-alia, stipulates that two or more qualified partners, meeting the requirements of Clause 2, Section-ITB and 'Qualification & Evaluation Requirement of the Bidder'(clause 13, 24 & 25 of ITB), as applicable may bid, provided, they submit a Letter of Intent to enter into Joint Venture Agreement and the Joint Venture Partners fulfill all other requirements under Clause 2, Section-ITB and 'Qualification & Evaluation Requirement of the Bidder'(clause 13, 24 & 25 of ITB), and technical provisions forming part of the bidding documents and in such a case, the Letter of Bid (Technical and Price Bid Form) shall be signed by all the proposed partners so as to legally bind all the Partners of the Joint Venture, who will be jointly and severally liable to perform the Contract by entering into Joint Venture Agreement a per Bidding Forms of the Bidding Documents which will be legally binding on all partners and all obligations hereunder.

The above clause further states that this Letter of Intent shall be attached to the bid and the Contract performance guarantee will be as per the format enclosed with the bidding document without any restrictions or liability for either party.

AND WHEREAS the bid is being submitted to the Employer vide proposal No.....dated..... by Party No.1 based on this Letter of Intent between all the parties; under these presents and the bid , has been signed by all the parties.

## NOW THIS UNDERTAKING WITNESSETH AS UNDER:

In consideration of the above premises and agreements all the parties of this Letter of Intent do hereby declare and undertake:

1. In requirement of the award of the Contract by the Employer to the Joint Venture Partners, we, the Parties do hereby undertake that M/s..... the Party No.1, shall act as Lead Partner and further declare and confirm that we the parties to the Joint Venture shall jointly and severally be bound unto the Employer for the successful performance of the Contract and shall be fully responsible for the design, manufacture, Supply, and successful performance of the equipment in accordance with the Contract for which we shall enter into Joint Venture Agreement as per Bidding Forms of the Bidding Documents which will be legally binding on all partners:
2. If the Contract is awarded to Joint Venture then in case of any breach or default of the said Contract by any of the parties to the Joint Venture, the party(s) will be fully responsible for the successful performance of the Contract and to carry out all the obligations and responsibilities under the Contract in accordance with the requirements of the Contract.
3. Further, if the Employer suffers any loss or damage on account of any breach in the Contract or any shortfall in the performance of the equipment in meeting the performances guaranteed as per the specification in terms of the Contract, the Party(s) of these presents will promptly make good such loss or damages caused to the Employer, on its demand without any demur. It shall not be necessary or obligatory for the Employer to proceed against Lead Partner to these presents before proceeding against or dealing with the other Party(s), the Employer can proceed against any of the parties who shall be jointly and severally liable for the performance and all other liabilities/obligations under the Contract to the Employer.
4. The financial liability of the Parties of the Deed of Undertaking to the Employer in the event of award of Contract on the Joint Venture, with respect to any of the claims rising out of the performance or non-performance of the obligations set forth in the Deed of Undertaking, read in conjunction with the relevant conditions of the Contract shall, however not be limited in any way so as to restrict or limit the liabilities or obligations of any of the Parties of the Deed of Undertaking.
5. It is expressly understood and agreed between the Parties to this Letter of Intent that the responsibilities and obligations of each of the Parties shall be as delineated in Annexure attached with this Letter of Intent. It is further undertaken by the parties that the above sharing of responsibilities and obligations shall not in any way be a limitation of joint and several responsibilities of the Parties under the Contract in the event of award on Joint Venture.
6. It is also understood that this Letter of Intent is provided for the purposes of undertaking joint and several liabilities of the partners to the Joint Venture for submission of the bid and performance of the Contract if awarded and that this Letter of Intent shall not be deemed to give rise to any additional liabilities or obligations, in any manner or any law, on any of the Parties to this Letter of Intent or on the Joint Venture, other than the express provisions of the Contract.



7. This Letter of Intent shall be construed and interpreted in accordance with the provisions of the Contract.
8. In case of an award of a Contract, we the parties to this Letter of Intent do hereby agree that we shall enter into Joint Venture Agreement as per Bidding Forms of the Bidding Documents which will be legally binding on all partners and we shall be jointly and severally responsible for furnishing a Contract performance security from a bank in favour of the Employer in the currency/currencies of the Contract.
9. It is further agreed that this Letter of Intent shall be irrevocable and shall form an integral part of the bid. It shall be effective from the date first mentioned above for all purposes and intents.

IN WITNESS WHEREOF, the Parties to this Letter of Intent have through their authorized representatives executed these presents and affixed Common Seals of their companies, on the day, month and year first mentioned above.

Common Seal of .....  
Has been affixed in my/ our  
presence pursuant to Board of  
Director's Resolution dated .....

For Lead Partner (Party No.-1)  
For and on behalf of M/s  
.....

Name .....  
Designation .....

Signature .....

(Signature of the authorized  
representative)

WITNESS :

I. ....

II. ....

Common Seal of .....  
Has been affixed in my/ our  
presence pursuant to Board of  
Director's Resolution dated .....

For Party No.-2  
For and on behalf of M/s.....

Name .....

(Signature of the authorized  
representative)

Designation .....

Signature .....

WITNESS :

I. ....

II. ....

Common Seal of .....  
Has been affixed in my/ our  
presence pursuant to Board of  
Director's Resolution dated .....

For Party No.-3  
For and on behalf of M/s.  
.....

Name .....

Designation .....

Signature .....

(Signature of the authorized  
representative)

WITNESS :

I. ....

II. ....

Notes:

1. In the event that the successful Bidder is a joint venture formed of two or more companies, the Employer requires that the parties to the joint venture accept joint and several liabilities for all obligations under the Contract.
2. The maximum number of J.V. partners is three (3).

(In the event that the successful Bidder is a joint venture formed of two or more companies, the Employer requires that the parties to the joint venture accept joint and several liabilities for all obligations under the Contract.)

**SCHEDULE -I TO BID****Equipment**

The Bidder shall provide adequate information and details to demonstrate clearly that it has the capability to meet the equipment proposed to be used in carrying out the Works at Site, including number of each kind, make, type, capacity of all equipment, working condition, which shall be deployed by him for Civil Work and Erection, Testing and Commissioning of the Works including requirements indicated in Technical Provisions, using the Forms below. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder.

|                              |                                                                                                                                                |                        |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| <b>Item of Equipment</b>     |                                                                                                                                                |                        |
| <b>Equipment Information</b> | Name of manufacturer                                                                                                                           | Model and power rating |
|                              | Capacity                                                                                                                                       | Year of manufacture    |
| <b>Current Status</b>        | Current location                                                                                                                               |                        |
|                              | Details of current commitments                                                                                                                 |                        |
| <b>Source</b>                | Indicate source of the equipment                                                                                                               |                        |
|                              | <input type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured |                        |

Omit the following information for equipment owned by the Bidder.

|                   |                                                                        |                        |
|-------------------|------------------------------------------------------------------------|------------------------|
| <b>Owner</b>      | Name of owner                                                          |                        |
|                   | Address of owner                                                       |                        |
|                   | Telephone                                                              | Contact name and title |
|                   | Fax                                                                    | Telex                  |
| <b>Agreements</b> | Details of rental/lease/manufacture agreements specific to the project |                        |
|                   |                                                                        |                        |

**Schedule – K TO BID****UNDERTAKING OF ACCEPTANCE OF AND COMPLIANCE WITH THE SOP  
FOR BLACKLISTING OF CONTRACTORS**

- A) I, \_\_\_\_\_ *[insert name and position of authorized signatory]*, being duly authorized by \_\_\_\_\_ *[insert name of the Bidder/members of joint venture ("JV") in case the Bidder is a JV]* (hereinafter referred to as the "Bidder") to execute this Undertaking of Acceptance of and Compliance with the SOP for Blacklisting of Contractors attached herewith (hereinafter referred to as the "SOP"), hereby certify on behalf of the Bidder that we, \_\_\_\_\_ *[insert name of the Bidder]* have read and accept the provisions of the SOP.
- B) I further certify, on behalf of the Bidder, that:
- (i) this Bid has been prepared and submitted in full compliance with the terms and conditions set forth in the SOP;
  - (ii) we have not, directly or indirectly, taken any action which is or constitutes inter alia a corrupt, fraudulent, collusive or coercive act or practice in violation of the SOP; and
  - (iii) we shall continue to comply with the terms and conditions of the SOP as and when amended, during period of evaluation of Bids and, in case we are selected for award of Contract, upto satisfactory completion of the Contract.

---

**Authorized Signatory**  
**For and on behalf of *[insert name of the Bidder]***  
**Date:**

**Schedule-L to Bid****MANUFACTURER'S AUTHORIZATION**

Date: \_\_\_\_\_

Bid Reference No.: \_\_\_\_\_

To: \_\_\_\_\_  
(Name of Employer)

WHEREAS we \_\_\_\_\_ who are official Manufacturer of \_\_\_\_\_ (name & description of Goods offered) having factories at \_\_\_\_\_ (address of factory) \_\_\_\_\_ do hereby authorize M/s \_\_\_\_\_ (Name and address of Bidder) to submit a Bid in relation to the Invitation for Bids indicated above, the purpose of which is to provide the following Goods manufactured by us and to subsequently negotiate and sign the Contract:

Description of Goods: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

We hereby extend our full guarantee and warranty in accordance with Clause 1.1.11 of the General Conditions of Contract, with respect to the Goods offered by the above firm in reply to this Invitation for Bids

Name: \_\_\_\_\_

In the capacity of: \_\_\_\_\_

Signed: \_\_\_\_\_

Duly authorized to sign the Authorization for and on behalf of \_\_\_\_\_  
(Name of Manufacturer)

Date: \_\_\_\_\_

**Note:** This letter of authority should be on the letter head of the Manufacturer and should be signed by a person competent and having the Power of Attorney to legally bind the Manufacturer.

**Schedule – M TO BID****UNDERTAKING FOR TYPE TEST OF EQUIPMENT****-- Note --**

*The bidder must accomplish the undertaking on stamp paper with bidder's complete name and address.*

Director General (Procurement), NGC

8th Floor Shaheen Complex

Egerton Road Lahore, Pakistan

**UNDERTAKING**

I / We, the undersigned, do hereby solemnly agree and undertake that,

- i. in case of award of Contract, if the submitted type test reports are not according to NGC's Type Test Policy, the {...name of bidder...} will carry out type tests as per NGC Type Test Policy within the quoted Bid price and without affecting the delivery/completion period as mentioned in the Bidding Documents;
- ii. {...name of bidder...} shall submit schedule of type testing from the testing lab within thirty (30) days from signing of Contract; and
- iii. after award of Contract, the {...name of bidder...} shall perform the requisite type tests before delivery of equipment without affecting the delivery/completion period as mentioned in the Bidding Documents within the quoted Bid price.

I undertake further that in case of delay or non-compliance of the above said requirements, NGC reserves the right to cancel the contract agreement including encashment of performance guarantee and initiate the process of blacklisting as per NGC SOP for blacklisting.

---

**Authorized Signatory**  
**For and on behalf of [insert name of the Bidder]**  
**Date:**

## **FORM/LETTER OF PRICE BID AND SCHEDULES TO BID**

### **Form of Price Bid**

### **Schedules to Bid**

- Schedule J to Bid: Integrity Pact

### **SCHEDULE OF PRICES**

- Preamble to Schedule of Prices
- Schedule of Prices

## LETTER OF PRICE BID

**Bid Reference No.:** .....

**Package No.:** .....

.....

.....

*[Name of Works]*

To:

.....

.....

.....

Gentlemen,

- m. Having examined the Bidding Documents including Instructions to Bidders, Conditions of Contract, Specifications, Drawings, Schedules to Bid, Schedule of Prices and Addenda Nos. .... For the execution of the above-named Works, we, the undersigned, being a company doing business under the name of and address .....

..... And being duly incorporated under the laws of ..... hereby offer to execute and complete such Works and remedy any defects therein in conformity with the said Documents including Addenda thereto for the Total Bid Price comprising of Local Currency Component of Pak Rupees ..... (Rs. ....) or such other sum as may be ascertained in accordance with the said Documents.

2. We understand that all the Schedules attached hereto form part of this Bid.
3. We undertake, if our Bid is accepted, to commence the Works and to deliver and complete the whole of the Works comprised in the Contract within the time(s) stated in Preamble to the Conditions of Contract.
4. We agree to abide by this Bid for the period of ..... Days from the date fixed for receiving the same and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
5. Unless and until a formal Agreement is prepared and executed, this Bid, together with your written acceptance thereof, shall constitute a binding contract between us.
6. We undertake, if our Bid is accepted to execute the Performance Security referred to in Clause 10 of Conditions of Contract for the due performance of the Contract.
7. We understand that you are not bound to accept the lowest or any Bid you may receive.



8. We do hereby declare that the Bid is made without any collusion, comparison of figures or arrangement with any other person or persons making a Bid for the Works.
9. We confirm, if our Bid is accepted, that all partners of the joint venture shall be liable jointly and severally for the execution of the Contract and the composition or the constitution of the joint venture shall not be altered without the prior consent of the Employer. (Please delete in case of Bid from a single firm).

Dated this ..... Day of ..... 2026...

Signature ..... in the capacity of .....duly authorized to sign the Bid  
for and on behalf of .....  
(Name of Bidder in Block Capitals)

(Seal of Bidder)

Bidder's Address

.....  
.....

Witness:

Signature: .....

Name: .....

Address:

.....  
.....

Occupation .....

**SCHEDULE - J TO BID****(INTEGRITY PACT)***[To be filled and signed by the Bidder]***DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC.  
PAYABLE BY THE SUPPLIERS OF GOODS, SERVICES & WORKS IN  
CONTRACTS WORTH RS. 10.00 MILLION OR MORE**

Contract No. \_\_\_\_\_

Dated \_\_\_\_\_

Contract Value: \_\_\_\_\_

Contract Title: \_\_\_\_\_

..... [Name of Supplier] hereby declares that it has not obtained or induced the procurement of any contract, right, interest, privilege or other obligation or benefit from Government of Pakistan (GoP) or any administrative subdivision or agency thereof or any other entity owned or controlled by GoP through any corrupt business practice.

Without limiting the generality of the foregoing, [name of Supplier] represents and warrants that it has fully declared the brokerage, commission, fees etc. paid or payable to anyone and not given or agreed to give and shall not give or agree to give to anyone within or outside Pakistan either directly or indirectly through any natural or juridical person, including its affiliate, agent, associate, broker, consultant, director, promoter, shareholder, sponsor or subsidiary, any commission, gratification, bribe, finder's fee or kickback, whether described as consultation fee or otherwise, with the object of obtaining or inducing the procurement of a contract, right, interest, privilege or other obligation or benefit in whatsoever form from GoP, except that which has been expressly declared pursuant hereto.

[name of Supplier] certifies that it has made and will make full disclosure of all agreements and arrangements with all persons in respect of or related to the transaction with GoP and has not taken any action or will not take any action to circumvent the above declaration, representation or warranty.

[name of Supplier] accepts full responsibility and strict liability for making any false declaration, not making full disclosure, misrepresenting facts or taking any action likely to defeat the purpose of this declaration, representation and warranty. It agrees that any contract, right, interest, privilege or other obligation or benefit obtained or procured as aforesaid shall, without prejudice to any other rights and remedies available to GoP under any law, contract or other instrument, be voidable at the option of GoP.

Notwithstanding any rights and remedies exercised by GoP in this regard, [name of Supplier] agrees to indemnify GoP for any loss or damage incurred by it on account of its corrupt business practices and further pay compensation to GoP in an amount equivalent to ten times the sum of any commission, gratification, bribe, finder's fee or kickback given by [name of Supplier] as aforesaid for the purpose of obtaining or inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever form from GoP.

Name of Buyer: .....

Name of Seller/Supplier: .....

Signature: .....

Signature: .....

[Seal]

[Seal]

## **SCHEDULE OF PRICES**

## **SCHEDULE OF PRICES**

### **Description**

1. Preamble to Schedule of Prices
2. Schedule of Prices

## **1. PREAMBLE TO SCHEDULE OF PRICES**

### **1. General**

- 1.1 The Schedule of Prices shall be read in conjunction with the Conditions of Contract together with Section-8 (Special Provisions) and Volume-II (Technical Provisions) including all documents referred therein.
- 1.2 The Contract shall be for the whole of the Works on EPC basis as described in these Bidding Documents. Bids must be for the complete scope of Work.
- 1.3 The Works shall be fit and sufficient for the purpose(s) for which they were intended as were expressly made known to the Contractor or could reasonably have been inferred by it.

### **2. Description**

- 2.1 Price given in the Schedule of Prices against each item shall be for the scope covered by that item as detailed in Section-8 (Special Provisions), Volume-II (Technical Provisions), the Specifications, Bid Drawings or elsewhere in the Bidding Documents. The general directions and descriptions of work and materials are not necessarily repeated nor summarized in the Schedule of Prices and do not generally give a full description of the Plant and equipment to be supplied and the services to be performed under each item. Bidders shall be deemed to have read the relevant sections of the Bidding Documents to ascertain the full scope of the requirements included in each item prior to filling in the rates and prices against each item in Schedule of Prices. The entered rates and prices shall be deemed to cover the full scope as aforesaid, including overheads and profit.

The Schedule of Prices only identifies major components of the structure and it does not restrict the responsibility of the Contractor to furnish all equipment, materials and services as deemed necessary by the Employer/Engineer for making the structure operationally complete and satisfactory as specified and/or implied in the Bidding Documents and subsequent revisions thereto.

- 2.2 If Bidders are unclear or uncertain as to the scope of any item, they shall seek clarification in accordance with clause IB 6 prior to submitting their bid.
- 2.3 The quantities shown in the Schedule of Prices are estimated quantities only as an indication of the Scope of Work to enable the bidder to bid for different items of the Works for his estimate of costs. The estimated quantities shall be used for comparing the bids. It is, however, to be noted that in the event of any increase or decrease in the quantity of any item of Works and subject to provisions of the Conditions of Contract herein, the actual quantities executed and measured by the Contractor and verified by the Engineer will be paid.

- 2.4 The sizes & dimensions mentioned and/or specified in the various technical descriptions and specifications including Bid Drawings are tentative and not final as the responsibility for detailed design rests with the Contractor under the Contract. If, in the opinion of the Engineer, at the time of review of Contractor's drawings/designs for approval, certain sizes & dimensions of some items have to be increased for proper completion and/or operation of the Works, then revised sizes & dimensions shall be supplied by the Contractor at no extra cost to the Employer.
- 2.5 Contractor will determine the required material quantities after carrying out detailed engineering and check survey of the transmission line route and procure material accordingly. Some material will be provided by NGC from its inventory. Contractor will be responsible for transporting the material provided by NGC from designated warehouse of NGC to construction site. Surplus material from the site will be transported to designated store/warehouse of NGC by the contractor. All cost related to transportation shall be borne by the contractor. Nonetheless, it is sole responsibility of the contractor to complete the project within scheduled time and in compliance of specification and employer's requirements.

### 3. Units & Abbreviations

- 3.1 Units of measurement, symbols and abbreviations expressed in the Bidding Documents shall comply with the Systeme Internationale d' Unites (SI Units).

The following abbreviations shall be used in the Schedule of Prices:

|                            | <b><u>Abbreviation</u></b> |
|----------------------------|----------------------------|
| Foreign Currency Component | FCC                        |
| Local Currency Component   | LCC                        |
| United States Dollars      | US\$                       |
| Pakistani Rupees           | PKR/Rs                     |
| Number                     | No.                        |
| Kilometer                  | km                         |
| Kilogram                   | Kg                         |
| Cubic Meter                | Cu.m                       |
| Provisional Sum            | PS                         |
| Percent                    | %                          |
| Quantity                   | Qty                        |

### 4. Rates and Prices

- 4.1 Except as otherwise expressly provided under the Conditions of Contract, the rates and amounts entered in the Schedule of Prices shall be the rates at which the Contractor shall be paid and shall be the full inclusive value of the work set forth or implied in the Contract; except for the amounts reimbursable to the

Contractor under the Contract.

- 4.2 Unless otherwise stipulated in the Conditions of Contract, the rates and prices entered by the bidder shall not be subject to adjustment during the performance of the Contract.
- 4.3 All duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause, as on the date twenty-eight (28) days prior to the deadline for submission of bids shall be included in the rates and prices and the total Bid Price submitted by a bidder.

Additional/reduced duties, taxes and levies due to subsequent additions or changes in legislation shall be reimbursed/ deducted as per provisions of the Conditions of Contract.

- 4.4 The whole cost of complying with the provisions of the Contract shall be included in the items provided in the priced Schedule of Prices, and where no items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related items of the Works and no separate payment will be made for those items.

The rates, prices and amounts shall be entered against each item in the Schedule of Prices. Any item against which no rate or price is entered by the bidder will not be paid for by the Employer when executed and shall be deemed covered by the rates and prices for other items in the Schedule of Prices.

If any item is quoted in both Schedule-1 and Schedule-2, the cost of that item shall be considered as an aggregate of both the prices.

- 4.5 The bidder shall be deemed to have obtained all information as to port clearance facilities and charges, loading and unloading facilities and charges, storage facilities and charges, transportation facilities and charges, congestion and/or other conditions to be expected at Karachi Port and or any other seaport of Pakistan and all requirements related thereto.
- 4.6 The Contractor shall be responsible to make complete arrangements for the transportation of the Plant to the Site. Contractor shall also be responsible for arrangement of all consumable materials for execution of works within the prices quoted in Price schedules/BoQ.

The bidder shall be deemed to have included all clearing, forwarding and other incidental costs in this regard in his bid. The Contractor will have the option to use either Karachi Port or any other seaport of Pakistan.

The Contractor shall provide for all parts of the Works to be completed in every

respect for commercial operation. Notwithstanding that any details, accessories, etc. required for the complete installation and satisfactory operation of the Plant, are not specifically mentioned in the Specifications, such details shall be considered as included in the Contract Price.

*(Note: \_ The transportation of spare serviceable material from site to NGC's designated store / warehouse after completion of the project may also be included in bidder's scope).*

## **5. Bid Prices**

### **5.1 Break-up of Bid Prices:**

The various elements of Bid Prices shall be quoted as detailed below:

#### **A. CIP (Project's Site) Price**

CIP (Project's Site) Price will be the total of CIF and inland transportation

CIF (Pakistan Seaport) Price

CIF (Pakistan Seaports) price will be the total of CFR price and insurance price, described as under:

##### **(a) CFR Port of Shipment**

The bidder shall quote prices for CFR Port of Shipment for all individual items and for each sub-total of Plant, Erection Equipment and Spare Parts to be supplied from outside Pakistan on CFR (Port of Shipment) basis. The CFR Port of Shipment price shall include the cost of the following:

- (i) Design, manufacture, finishing, factory testing, packing for transport and all transportation costs incurred in placing the Plant, Erection Equipment and Spare Parts and other materials on board the vessel.
- ii) Provision of clean on-board bills of lading.
- iii) Export taxes, fees or charges levied on exporting Plant, Erection Equipment and Spare Parts and other materials in the country of origin, and all direct taxes levied in Pakistan (except custom duties as mentioned in Clause 5.1 (B)) in the case of Plant imported to Pakistan.
- iv) Provision of certificates of origin, consular invoices (if required) or any other documents issued in the country of origin.



## v) Shipping:

The bidder shall quote prices for shipping from port of shipment to the port of entry in Pakistan for the sub-totals of the Plant, Erection Equipment, Spare Parts and other materials to be imported for the Contract in Pakistan. Such prices shall include all marine transportation costs including ocean freight and other charges, etc.

The prices for shipping/marine transportation shall be quoted for shipment through reputed shipping lines including Pakistan National Shipping Corporation (PNSC).

Cost of shipment(s) effected by the Contractor at his option by aircraft shall be deemed to be included in the Total Bid Price.

## (b) Insurance

The bidder shall quote prices for insurance cover from ex-factory/ ex-works to the Site for the sub-totals of the Plant, Erection Equipment, Spare Parts and other materials to be imported for the Contract. Such prices shall include all insurance costs covering the responsibility for all loss or damages while loading, unloading, storing and trimming on board or on inland carrier and transportation to Site. This , includes but is not limited to war risks, strikes, riot and civil commotion (SRCC), fire, smoke, explosion, terrorism, collision, overturn, derailment, flood, theft or attempted theft.

All insurance cover shall be affected with National Insurance Company Limited (NICL), Pakistan as per Clause GCC 43.12.

## B) Customs Duties

Customs duty for Plant, Erection Equipment, Spare Parts and other materials, if any, offered from outside Pakistan shall include customs duties and other indirect taxes paid or payable in relation to clearance of Plant from port. Bidder will give breakup and Employer will pay the Custom Duties.

## C) Ex-factory Price for Local Goods

The bidder shall quote prices for Local Goods, materials (other than materials required for civil works such as concrete and reinforcement etc. Cost of which will be included in the price of civil works), spare parts

and equipment in the relevant column of EXW (Pakistan) of "Schedule of Prices". Such prices shall include:

- (i) Design documentation, drawings, drafting, planning services, manufacturing, testing and packing of finished goods ready for delivery to Site.
- ii) All custom duties, sales tax and other taxes already paid or payable on the components and raw materials used in the manufacture or assembly of Local Goods, materials and equipment.
- iii) Insurance of Local Goods and other materials from factory to Site including all insurance costs covering the responsibility of all losses or damages, while loading, unloading, storing, trimming on the carrier and transporting to Site. Checking and verifying of consignments, issuance of receiving reports and damage reports (when applicable) shall be the Contractor's responsibility. The insurance shall be affected with National Insurance Company (NIC) of Pakistan as per Clause GCC 43.12.

D) Local Transport

Inland transportation for the Plant, Erection Equipment and Spare Parts shall be the Contractor's responsibility in respect of:

- (i) the Plant, Erection Equipment, Spare Parts and other materials offered from outside Pakistan; from the port of entry in Pakistan to the storage area at the Site, and
- ii) indigenous Plant, Erection Equipment, Spare Parts and other materials if any, offered from within Pakistan; from the factory in Pakistan to the storage area at the Site, and all charges occurring therefrom including octroi, zila tax, fees etc. and charges for loading, forwarding and unloading expenses shall be borne by the Contractor. Unloading at the Site, handling of the Plant, Erection Equipment, Spare Parts and other materials to the designated point of Site storage, checking and verifying all shipments received against shipping documents, issue of all receiving reports and issues of damage reports (when applicable) shall be the Contractor's responsibility.
- iii) Plant, Erection Equipment, Spare Parts and other materials spared after completion of works from the Site/Designated Storage Yard to the NGC designated Warehouse (Faisalabad/ Lahore/ Jamshoro/ Multan), and all charges occurring therefrom including octroi, zila tax, fees etc. and charges for loading, forwarding and unloading expenses shall be borne by the

Contractor. Unloading at the Warehouse, handling of the Plant, Erection Equipment, Spare Parts and other materials, checking and verifying all equipment/inventories against material reconciliation reports, issue of all receiving reports and issues of damage reports (when applicable) shall be the Contractor's responsibility. All Coordination in allocation and handing over of material will be carried out through Project Manager/Engineer.

The bidder shall recognize such elements of the costs which he expects to incur in the performance of the Works and shall include all such costs in the rates and amounts entered in the Schedule of Prices including all taxes.

E) Installation & Other Services

The bidder shall quote prices for Installation & Other Services for the sub-totals of the Plant at the Site. Such prices shall include the costs of handling of the Plant and other materials from Site storage to point of final installation, erection, installation, testing, commissioning including all inspection, reliability tests, the cost of foreign and local erection staff and labour, tools and equipment, etc. It shall also cover the services of qualified representative(s) of the supplier(s) of Plant or adviser(s) to assure proper erection and commissioning of the Plant. The price shall also include cost of arranging insurances in respect of Contractor's operations in Pakistan which insurances shall be affected by the Contractor with the National Insurance Company (NIC) of Pakistan in accordance with GCC 43.12. The price shall also include all direct taxes. Provincial taxes and other indirect taxes shall be quoted separately.

5.2 Total Bid Price

The total of bid prices under foreign currency and local currency columns in the Schedule of Prices shall be entered in the Summary of Bid Prices. The unit rates and prices and lumpsum amount entered in the Schedule of Prices will be the rates at which the Contractor will be paid, and shall be deemed to be the full inclusive value of the work including all costs of performing the Works such as overheads, income tax, super tax, profits, costs of accepting the general risks, liabilities and obligations set forth or implied in the Contract except for the amounts reimbursable, if any, to the Contractor under the Contract. The rates shall also include Contractor's cost for providing Performance Security and other Bank Guarantees required for performance of the Contract.

*Note: A breakup of lumpsum prices will be provided by the bidder alongside the bid. Such Breakup shall not alter the treatment of the lumpsum items during evaluation/award but will provide a reference for future valuations/determinations*

*during Contract execution Stage*

## **6. Spare Parts**

- 6.1 In the Schedule of Prices, under Spare Parts, the Employer has drawn up a list of spare parts along with estimated quantities. For Spare Parts to be supplied from outside Pakistan, the bidder shall enter the CIP price for all individual items breaking up the price into CIF (CFR Port of Shipment, Shipping to wharf at the port of entry in Pakistan, Insurance to Site) and Local Transport in Pakistan against each sub-total. For Spare Parts to be supplied from within Pakistan, EXW price (including insurance to Site) and local Transport in Pakistan, etc. shall be entered. These spare parts shall be furnished and the cost included in the Bid Price.

The Employer shall have the option of ordering additional quantities of these essential spare parts, at the unit rates entered in the Schedule of Prices, no later than one year after the Commencement Date.

The unit rate for any item shall be computed by dividing the total amount by the quantity of that item.

- 6.2 The Bidder shall also list in the space provided in the Schedule of Prices any Spare Parts which he recommends be provided for the Works, in addition to those specified by the Employer in the Schedule of Prices. The Bidder shall enter against each such item, its recommended quantity, rate and price. The cost of such Additional Recommended Spare Parts will not be considered in the evaluation of bids.

The Additional Recommended Spare Parts may be selected by the Engineer/ Employer and the Contract Price will be adjusted in accordance with the prices set against those items in the Schedule of Prices.

## **7. Reimbursable Costs**

- 7.1 If provided in the Particular Conditions of Contract, the Contractor shall be reimbursed the actual amounts (without any overhead charges and profits) disbursed by him in respect of non-exempt Pakistani customs, import duties, and taxes, levied upon Plant, Erection Equipment and Spare Parts imported directly by him or his subcontractors into Pakistan for the purpose of this Contract for incorporation in the Works.
- 7.2 The bidder shall recognize such elements of the costs which he expects to incur in the performance of the Works and which are reimbursable, and he shall not include any such costs in the rates and amounts entered in the Schedule of Prices.

**8. Provisional Sums**

- 8.1 Provisional Sums included and so designated in the Schedule of Prices if any, shall be expended in whole or in part at the direction and discretion of the Employer/ Engineer. The Contractor will only receive payment in respect of Provisional Sums if he has been instructed by the Employer/Engineer to utilize such sums.

# **Schedules of Rates and Prices**

## **(LOT-I)**

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme**  
**Lot-I: 500 kV D/C Ludewala–Faisalabad West —Section A (Approx. 51 km)**

**SCHEDULE NO.1- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM ABROAD**

| Item No. | Description                                                                                                                                                                                                                                                                                                             | Code Country of Origin | Unit | Quantity | Unit Price (CIF Pakistan Seaport) |           | Total Price (CIF Pakistan Seaport) |           | Total Inland Transportation | Total Price CIP (Project Site) |          | Taxes & Duties |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------|----------|-----------------------------------|-----------|------------------------------------|-----------|-----------------------------|--------------------------------|----------|----------------|
|          |                                                                                                                                                                                                                                                                                                                         |                        |      |          | CFR                               | Insurance | CFR                                | Insurance |                             | FCC                            | LCC      | Local Currency |
| 1        | 2                                                                                                                                                                                                                                                                                                                       | 3                      | 4    | 5        | 6                                 | 7         | 8=5 x 6                            | 9 = 5 x 7 | 10                          | 11=8                           | 12= 9+10 | 13             |
| <b>A</b> | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                                              |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| 1        | Furnish 500 kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|          | (a) <u>Tower Type "DS1"</u>                                                                                                                                                                                                                                                                                             |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|          | (i) Basic Tower Body                                                                                                                                                                                                                                                                                                    |                        | No.  | 121      |                                   |           |                                    |           |                             |                                |          |                |
|          | (ii) 2.0 m Single Leg Extension                                                                                                                                                                                                                                                                                         |                        | No.  | 48       |                                   |           |                                    |           |                             |                                |          |                |
|          | (iii) 4.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        |                        | No.  | 104      |                                   |           |                                    |           |                             |                                |          |                |
|          | (iv) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                                         |                        | No.  | 184      |                                   |           |                                    |           |                             |                                |          |                |

|     |                         |                            |     |     |  |  |  |  |  |  |  |  |  |
|-----|-------------------------|----------------------------|-----|-----|--|--|--|--|--|--|--|--|--|
|     | (v)                     | 8.0 m Single Leg Extension | No. | 148 |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 6.0 m Body Extension       | No. | 2   |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 484 |  |  |  |  |  |  |  |  |  |
| (b) | <u>Tower Type "DA1"</u> |                            |     |     |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 17  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 2.0 m Single Leg Extension | No. | -   |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 4.0 m Single Leg Extension | No. | 8   |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 6.0 m Single Leg Extension | No. | 36  |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 8.0 m Single Leg Extension | No. | 24  |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 6.0 m Body Extension       | No. | 5   |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 68  |  |  |  |  |  |  |  |  |  |
| (c) | <u>Tower Type "DD1"</u> |                            |     |     |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 19  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 2.0 m Single Leg Extension | No. | 4   |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 4.0 m Single Leg Extension | No. | 16  |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 6.0 m Single Leg Extension | No. | 36  |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 8.0 m Single Leg Extension | No. | 20  |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 6.0 m Body Extension       | No. | 5   |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 76  |  |  |  |  |  |  |  |  |  |
| (d) | <u>Tower Type "TDT"</u> |                            |     |     |  |  |  |  |  |  |  |  |  |



|          |                                                              |                                                               |     |       |  |  |  |  |  |  |  |  |  |
|----------|--------------------------------------------------------------|---------------------------------------------------------------|-----|-------|--|--|--|--|--|--|--|--|--|
|          | (i)                                                          | Basic Tower Body                                              | No. | 1     |  |  |  |  |  |  |  |  |  |
|          | (ii)                                                         | 4.0 m Single Leg Extension                                    | No. | 4     |  |  |  |  |  |  |  |  |  |
|          | (iii)                                                        | Stubs                                                         | No. | 4     |  |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total A :</b>                                         |                                                               |     |       |  |  |  |  |  |  |  |  |  |
| <b>B</b> | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                                                               |     |       |  |  |  |  |  |  |  |  |  |
| 1        | Furnish 795 KCM ACSR "Drake" Conductor                       |                                                               | km  | 1,248 |  |  |  |  |  |  |  |  |  |
| 2        | Furnish                                                      |                                                               |     |       |  |  |  |  |  |  |  |  |  |
|          | (a)                                                          | OPGW with at least 24 fibers                                  | km  | 120   |  |  |  |  |  |  |  |  |  |
|          | (b)                                                          | Joint boxes for OPGW                                          |     |       |  |  |  |  |  |  |  |  |  |
|          | (i)                                                          | OPGW-OPGW (A Type)                                            | No. | 24    |  |  |  |  |  |  |  |  |  |
|          | (ii)                                                         | OPGW-OPGW Cable ( B Type)                                     | No. | 3     |  |  |  |  |  |  |  |  |  |
|          | (iii)                                                        | OPGW-attaching Clamps                                         | No. | 1,620 |  |  |  |  |  |  |  |  |  |
|          | (iv)                                                         | Fibre Optic Approach Cable                                    | km  | 6     |  |  |  |  |  |  |  |  |  |
|          | (c)                                                          | Test Equipment, Installation and Maintenance Tools            |     | -     |  |  |  |  |  |  |  |  |  |
|          | -                                                            | Fiber Optic Talk Set (Set comprised two units)                | Set | 1     |  |  |  |  |  |  |  |  |  |
|          | -                                                            | Fiber Optic Tool Kit                                          | Set | 1     |  |  |  |  |  |  |  |  |  |
|          | -                                                            | OTDR with range $\geq$ 400km<br>Yokogawa AQ7260 or equivalent | Set | 1     |  |  |  |  |  |  |  |  |  |
|          | <b>Sub Total B :</b>                                         |                                                               |     |       |  |  |  |  |  |  |  |  |  |

| C | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b> |                                                                                                                                                                                                                                                                                                                                      |     |     |  |  |  |  |  |  |  |  |
|---|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|--|--|--|--|--|--|--|--|
|   | 1                                                                                                            | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001                                                                                    | Set | 726 |  |  |  |  |  |  |  |  |
|   | 2                                                                                                            | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002                                                                             | Set | 216 |  |  |  |  |  |  |  |  |
|   | 3                                                                                                            | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005                                                                   | Set | 432 |  |  |  |  |  |  |  |  |
|   | 4                                                                                                            | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower type 'TDT' including Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing (Note: No. of Insulators in each arm/string = 29 Nos.) as per specification drawing No. 4029/169/401C/TD/01E005a | Set | 8   |  |  |  |  |  |  |  |  |
|   | 5                                                                                                            | Furnish Single string Transposition Assembly Upright type "TDTU(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No.                                                                                           | Set | 4   |  |  |  |  |  |  |  |  |



|          |                                                                                                                                                                                                                                                     |  |         |     |  |  |  |  |  |  |  |  |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------|-----|--|--|--|--|--|--|--|--|
| 11       | Furnish Straight Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                               |  | Set     | 16  |  |  |  |  |  |  |  |  |
| 12       | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010  |  | Set     | 6   |  |  |  |  |  |  |  |  |
| 13       | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011 |  | Set     | 6   |  |  |  |  |  |  |  |  |
| 14       | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assemblies (items C1 - 8 & C12-13) with Coulomb or ElecNET software.                                                                       |  | Lumpsum | 1   |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total C :</b>                                                                                                                                                                                                                                |  |         |     |  |  |  |  |  |  |  |  |
| <b>D</b> | <b><u>Hardware for OPGW</u></b>                                                                                                                                                                                                                     |  |         |     |  |  |  |  |  |  |  |  |
| 1        | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                               |  | Set     | 242 |  |  |  |  |  |  |  |  |
| 2        | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                                                                                                        |  | Set     | 24  |  |  |  |  |  |  |  |  |
| 3        | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                                                                                           |  | Set     | 74  |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total D :</b>                                                                                                                                                                                                                                |  |         |     |  |  |  |  |  |  |  |  |
| <b>E</b> | <b><u>Accessories and Dampers</u></b>                                                                                                                                                                                                               |  |         |     |  |  |  |  |  |  |  |  |

|                      |                                                                                                                                                                                                                  |       |       |  |  |  |  |  |  |  |  |  |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|--|--|--|--|--|--|--|--|--|
| 1                    | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                                                         | No.   | 429   |  |  |  |  |  |  |  |  |  |
| 2                    | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                                                              | No.   | 215   |  |  |  |  |  |  |  |  |  |
| 3                    | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor.                                         | No.   | 1,954 |  |  |  |  |  |  |  |  |  |
| 4                    | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                                                        | No.   | 6,620 |  |  |  |  |  |  |  |  |  |
| 5                    | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor (See Note-3)                                                                                                                          | No.   | 1,655 |  |  |  |  |  |  |  |  |  |
| 6                    | Furnish stock bridge vibration dampers for OPGW.                                                                                                                                                                 | No.   | 795   |  |  |  |  |  |  |  |  |  |
| <b>Sub-Total E :</b> |                                                                                                                                                                                                                  |       |       |  |  |  |  |  |  |  |  |  |
| <b>F</b>             | <b><u>Grounding Material</u></b>                                                                                                                                                                                 |       |       |  |  |  |  |  |  |  |  |  |
| 1                    | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                                                                    | No.   | 316   |  |  |  |  |  |  |  |  |  |
| 2                    | Furnish flat to cable connector.                                                                                                                                                                                 | No.   | 316   |  |  |  |  |  |  |  |  |  |
| 3                    | Furnish cable to rod connector.                                                                                                                                                                                  | No.   | 316   |  |  |  |  |  |  |  |  |  |
| 4                    | Furnish 7 No. 10 copper covered ground wire.                                                                                                                                                                     | Meter | 948   |  |  |  |  |  |  |  |  |  |
| <b>Sub-Total F :</b> |                                                                                                                                                                                                                  |       |       |  |  |  |  |  |  |  |  |  |
| <b>G</b>             | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                                                              |       |       |  |  |  |  |  |  |  |  |  |
| <b>1</b>             | <b><u>Steel Towers</u></b>                                                                                                                                                                                       |       |       |  |  |  |  |  |  |  |  |  |
|                      | Furnish 500kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards |       |       |  |  |  |  |  |  |  |  |  |

|  |                                                                                                       |                         |                            |  |     |    |  |  |  |  |  |  |  |
|--|-------------------------------------------------------------------------------------------------------|-------------------------|----------------------------|--|-----|----|--|--|--|--|--|--|--|
|  | (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                         |                            |  |     |    |  |  |  |  |  |  |  |
|  | (a)                                                                                                   | <u>Tower Type "DS1"</u> |                            |  |     |    |  |  |  |  |  |  |  |
|  |                                                                                                       | (i)                     | Basic Tower Body           |  | No. | 12 |  |  |  |  |  |  |  |
|  |                                                                                                       | (ii)                    | 2.0 m Single Leg Extension |  | No. | 8  |  |  |  |  |  |  |  |
|  |                                                                                                       | (iii)                   | 4.0 m Single Leg Extension |  | No. | 16 |  |  |  |  |  |  |  |
|  |                                                                                                       | (iv)                    | 6.0 m Single Leg Extension |  | No. | 20 |  |  |  |  |  |  |  |
|  |                                                                                                       | (v)                     | 8.0 m Single Leg Extension |  | No. | 16 |  |  |  |  |  |  |  |
|  |                                                                                                       | (vi)                    | 6.0 m Body Extension       |  | No. | 1  |  |  |  |  |  |  |  |
|  |                                                                                                       | (vii)                   | Stubs                      |  | No. | 48 |  |  |  |  |  |  |  |
|  | (b)                                                                                                   | <u>Tower Type "DA1"</u> |                            |  |     |    |  |  |  |  |  |  |  |
|  |                                                                                                       | (i)                     | Basic Tower Body           |  | No. | 4  |  |  |  |  |  |  |  |
|  |                                                                                                       | (ii)                    | 2.0 m Single Leg Extension |  | No. | 4  |  |  |  |  |  |  |  |
|  |                                                                                                       | (iii)                   | 4.0 m Single Leg Extension |  | No. | 8  |  |  |  |  |  |  |  |
|  |                                                                                                       | (iv)                    | 6.0 m Single Leg Extension |  | No. | 4  |  |  |  |  |  |  |  |
|  |                                                                                                       | (v)                     | 8.0 m Single Leg Extension |  | No. | 4  |  |  |  |  |  |  |  |
|  |                                                                                                       | (vi)                    | 6.0 m Body Extension       |  | No. | 1  |  |  |  |  |  |  |  |
|  |                                                                                                       | (vii)                   | Stubs                      |  | No. | 16 |  |  |  |  |  |  |  |
|  | (c)                                                                                                   | <u>Tower Type "DD1"</u> |                            |  |     |    |  |  |  |  |  |  |  |

|   |                                                                                                              |                              |     |       |  |  |  |  |  |  |  |  |  |
|---|--------------------------------------------------------------------------------------------------------------|------------------------------|-----|-------|--|--|--|--|--|--|--|--|--|
|   | (i)                                                                                                          | Basic Tower Body             | No. | 4     |  |  |  |  |  |  |  |  |  |
|   | (ii)                                                                                                         | 2.0 m Single Leg Extension   | No. | 8     |  |  |  |  |  |  |  |  |  |
|   | (iii)                                                                                                        | 4.0 m Single Leg Extension   | No. | 8     |  |  |  |  |  |  |  |  |  |
|   | (iv)                                                                                                         | 6.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|   | (v)                                                                                                          | 8.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|   | (vi)                                                                                                         | 6.0 m Body Extension         | No. | 1     |  |  |  |  |  |  |  |  |  |
|   | (vii)                                                                                                        | Stubs                        | No. | 16    |  |  |  |  |  |  |  |  |  |
|   | (d)                                                                                                          | <u>Tower Type "TDT"</u>      |     |       |  |  |  |  |  |  |  |  |  |
|   | (i)                                                                                                          | Basic Tower Body             | No. | -     |  |  |  |  |  |  |  |  |  |
|   | (ii)                                                                                                         | 6.0 m Single Leg Extension   | No. | -     |  |  |  |  |  |  |  |  |  |
|   | (iii)                                                                                                        | Stubs                        | No. | -     |  |  |  |  |  |  |  |  |  |
|   | <b><u>Conductor and OPGW (With Associated Equipment)</u></b>                                                 |                              |     |       |  |  |  |  |  |  |  |  |  |
| 2 | Furnish 795 KCM ACSR "Drake" Conductor                                                                       |                              | km  | 124.8 |  |  |  |  |  |  |  |  |  |
| 3 | Furnish                                                                                                      |                              |     |       |  |  |  |  |  |  |  |  |  |
|   | (a)                                                                                                          | OPGW with at least 24 fibers | km  | 15    |  |  |  |  |  |  |  |  |  |
|   | (b)                                                                                                          | Joint boxes for OPGW         |     |       |  |  |  |  |  |  |  |  |  |
|   | (i)                                                                                                          | OPGW-OPGW (A Type)           | No. | 2     |  |  |  |  |  |  |  |  |  |
|   | (ii)                                                                                                         | OPGW-OPGW Cable ( B Type)    | No. | -     |  |  |  |  |  |  |  |  |  |
|   | (iii)                                                                                                        | OPGW-attaching Clamps        | No. | 120   |  |  |  |  |  |  |  |  |  |
|   | (iv)                                                                                                         | Fibre Optic Approach Cable   | km  | -     |  |  |  |  |  |  |  |  |  |
|   | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b> |                              |     |       |  |  |  |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                                    |  |     |    |  |  |  |  |  |  |  |  |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|----|--|--|--|--|--|--|--|--|
| 4 | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001                  |  | Set | 72 |  |  |  |  |  |  |  |  |
| 5 | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002           |  | Set | 48 |  |  |  |  |  |  |  |  |
| 6 | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005 |  | Set | 96 |  |  |  |  |  |  |  |  |
| 7 | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                 |  | Set | 6  |  |  |  |  |  |  |  |  |
| 8 | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                |  | Set | 6  |  |  |  |  |  |  |  |  |
|   | <b><u>Hardware for OPGW</u></b>                                                                                                                                                                                                                                    |  |     |    |  |  |  |  |  |  |  |  |
| 9 | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                                              |  | Set | 24 |  |  |  |  |  |  |  |  |



|    |                                                                                                                                                                          |  |        |     |  |  |  |  |  |  |  |  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------|-----|--|--|--|--|--|--|--|--|
| 10 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                             |  | Set    | 3   |  |  |  |  |  |  |  |  |
| 11 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                |  | Set    | 16  |  |  |  |  |  |  |  |  |
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |  |        |     |  |  |  |  |  |  |  |  |
| 12 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 |  | No.    | 43  |  |  |  |  |  |  |  |  |
| 13 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      |  | No.    | 21  |  |  |  |  |  |  |  |  |
| 14 | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. |  | No.    | 475 |  |  |  |  |  |  |  |  |
| 15 | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                |  | No.    | 922 |  |  |  |  |  |  |  |  |
| 16 | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor                                                                                               |  | No.    | 230 |  |  |  |  |  |  |  |  |
| 17 | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         |  | No.    | 115 |  |  |  |  |  |  |  |  |
| 18 | 60 ton hydraulic compressor                                                                                                                                              |  | No.    | 1   |  |  |  |  |  |  |  |  |
| 19 | 100 ton hydraulic compressor                                                                                                                                             |  | No.    | 1   |  |  |  |  |  |  |  |  |
| 20 | Compression dies for "Drake" conductor                                                                                                                                   |  | No.    | 2   |  |  |  |  |  |  |  |  |
| 21 | Filler Compound, a carton of 100, 0.4536 kg tubes                                                                                                                        |  | Carton | 1   |  |  |  |  |  |  |  |  |
| 22 | Electrical Joint compound, a carton of 100, 0.23 kg tubes.                                                                                                               |  | Carton | 1   |  |  |  |  |  |  |  |  |
|    | <b><u>Grounding Material</u></b>                                                                                                                                         |  |        |     |  |  |  |  |  |  |  |  |

|                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |       |     |  |  |  |  |  |  |  |   |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------|-----|--|--|--|--|--|--|--|---|
| 23                                                                       | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                                                                                                                                                                                                                                                                                                     |  | No.   | 40  |  |  |  |  |  |  |  |   |
| 24                                                                       | Furnish flat to cable connector.                                                                                                                                                                                                                                                                                                                                                                                                                  |  | No.   | 40  |  |  |  |  |  |  |  |   |
| 25                                                                       | Furnish cable to rod connector.                                                                                                                                                                                                                                                                                                                                                                                                                   |  | No.   | 40  |  |  |  |  |  |  |  |   |
| 26                                                                       | Furnish 7 No. 10 copper covered ground wire.                                                                                                                                                                                                                                                                                                                                                                                                      |  | Meter | 120 |  |  |  |  |  |  |  |   |
|                                                                          | Sub-Total of G :                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |       |     |  |  |  |  |  |  |  |   |
|                                                                          | Total of Item A                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |       |     |  |  |  |  |  |  |  |   |
|                                                                          | Total of Item B                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |       |     |  |  |  |  |  |  |  | - |
|                                                                          | Total of Item C                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |       |     |  |  |  |  |  |  |  | - |
|                                                                          | Total of Item D                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |       |     |  |  |  |  |  |  |  | - |
|                                                                          | Total of Item E                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |       |     |  |  |  |  |  |  |  | - |
|                                                                          | Total of Item F                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |       |     |  |  |  |  |  |  |  | - |
|                                                                          | Total of Item G                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |       |     |  |  |  |  |  |  |  | - |
| Grand Total of column No. 11 & 12 to be carried forward to Grand summary |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |       |     |  |  |  |  |  |  |  | - |
| * The Bidder shall specify the type of insulator being offered.          |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |       |     |  |  |  |  |  |  |  |   |
| Notes:                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |       |     |  |  |  |  |  |  |  |   |
| 1                                                                        | Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types DS1, DA1, DD1, and TDT, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly. |  |       |     |  |  |  |  |  |  |  |   |
| 2                                                                        | The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.                                                                                                                                                                                                                                                                                               |  |       |     |  |  |  |  |  |  |  |   |
| 3                                                                        | The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.                                                                                                                                                                                      |  |       |     |  |  |  |  |  |  |  |   |

- 4 The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.
- 5 The contractor shall be responsible to furnish the tower material, OPGW, conductor, insulators, accessories, dampers & hardware for conductor and OPGW, for completion of line in all respects. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.
- 6 The contractor shall transport, unload and stack leftover/additional material from site to NGC designated Warehouse/Store at its own cost.
- 7 Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.
- 8 The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully read before filling up the schedule of prices.
- 9 Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.
- 10 Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.
- 11 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.

**Signature  
of Bidder**

\_\_\_\_\_

| Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme |                                                                                                                                                                                                                                                                                                                         |      |          |                |           |                 |                             |                            |                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------|----------------|-----------|-----------------|-----------------------------|----------------------------|--------------------------------------|
| Lot-I: 500 kV D/C Ludewala–Faisalabad West —Section A (Approx. 51 km)                                                                                |                                                                                                                                                                                                                                                                                                                         |      |          |                |           |                 |                             |                            |                                      |
| SCHEDULE NO.2- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM WITHIN PAKISTAN                                                                         |                                                                                                                                                                                                                                                                                                                         |      |          |                |           |                 |                             |                            |                                      |
| Item No.                                                                                                                                             | Description                                                                                                                                                                                                                                                                                                             | Unit | Quantity | Unit Price     |           | Total EXW Price | Total Inland Transportation | Total Price Local Currency | Sales and other Taxes & Duties (PKR) |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                         |      |          | Local Currency | EXW Price |                 |                             |                            |                                      |
| 1                                                                                                                                                    | 2                                                                                                                                                                                                                                                                                                                       | 3    | 4        | 5              | 6         | 7 = 4 x 6       | 8                           | 9 = 7+ 8                   | 10                                   |
| A                                                                                                                                                    | Steel Towers                                                                                                                                                                                                                                                                                                            |      |          |                |           |                 |                             |                            |                                      |
| 1                                                                                                                                                    | Furnish 500 kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |      |          |                |           |                 |                             |                            |                                      |
|                                                                                                                                                      | (a) Tower Type "DS1"                                                                                                                                                                                                                                                                                                    |      |          |                |           |                 |                             |                            |                                      |
|                                                                                                                                                      | (i) Basic Tower Body                                                                                                                                                                                                                                                                                                    | No.  | 121      |                |           |                 |                             |                            |                                      |
|                                                                                                                                                      | (ii) 2.0 m Single Leg Extension                                                                                                                                                                                                                                                                                         | No.  | 48       |                |           |                 |                             |                            |                                      |
|                                                                                                                                                      | (iii) 4.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No.  | 104      |                |           |                 |                             |                            |                                      |
|                                                                                                                                                      | (iv) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                                         | No.  | 184      |                |           |                 |                             |                            |                                      |
|                                                                                                                                                      | (v) 8.0 m Single Leg Extension                                                                                                                                                                                                                                                                                          | No.  | 148      |                |           |                 |                             |                            |                                      |
|                                                                                                                                                      | (vi) 6.0 m Body Extension                                                                                                                                                                                                                                                                                               | No.  | 2        |                |           |                 |                             |                            |                                      |
|                                                                                                                                                      | (vii) Stubs                                                                                                                                                                                                                                                                                                             | No.  | 484      |                |           |                 |                             |                            |                                      |
|                                                                                                                                                      | (b) Tower Type "DA1"                                                                                                                                                                                                                                                                                                    |      |          |                |           |                 |                             |                            |                                      |

|          |                                                              |                              |     |       |  |  |  |  |  |  |
|----------|--------------------------------------------------------------|------------------------------|-----|-------|--|--|--|--|--|--|
|          | (i)                                                          | Basic Tower Body             | No. | 17    |  |  |  |  |  |  |
|          | (ii)                                                         | 2.0 m Single Leg Extension   | No. | -     |  |  |  |  |  |  |
|          | (iii)                                                        | 4.0 m Single Leg Extension   | No. | 8     |  |  |  |  |  |  |
|          | (iv)                                                         | 6.0 m Single Leg Extension   | No. | 36    |  |  |  |  |  |  |
|          | (v)                                                          | 8.0 m Single Leg Extension   | No. | 24    |  |  |  |  |  |  |
|          | (vi)                                                         | 6.0 m Body Extension         | No. | 5     |  |  |  |  |  |  |
|          | (vii)                                                        | Stubs                        | No. | 68    |  |  |  |  |  |  |
|          | (c)                                                          | <u>Tower Type "DD1"</u>      |     |       |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body             | No. | 19    |  |  |  |  |  |  |
|          | (ii)                                                         | 2.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |
|          | (iii)                                                        | 4.0 m Single Leg Extension   | No. | 16    |  |  |  |  |  |  |
|          | (iv)                                                         | 6.0 m Single Leg Extension   | No. | 36    |  |  |  |  |  |  |
|          | (v)                                                          | 8.0 m Single Leg Extension   | No. | 20    |  |  |  |  |  |  |
|          | (vi)                                                         | 6.0 m Body Extension         | No. | 5     |  |  |  |  |  |  |
|          | (vii)                                                        | Stubs                        | No. | 76    |  |  |  |  |  |  |
|          | (d)                                                          | <u>Tower Type "TDT"</u>      |     |       |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body             | No. | 1     |  |  |  |  |  |  |
|          | (ii)                                                         | 4.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |
|          | (iii)                                                        | Stubs                        | No. | 4     |  |  |  |  |  |  |
|          | <b>Sub-Total A :</b>                                         |                              |     |       |  |  |  |  |  |  |
| <b>B</b> | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                              |     |       |  |  |  |  |  |  |
| 1        | Furnish 795 KCM ACSR "Drake" Conductor                       |                              | km  | 1,248 |  |  |  |  |  |  |
| 2        | Furnish                                                      |                              |     |       |  |  |  |  |  |  |
|          | (a)                                                          | OPGW with at least 24 fibers | km  | 120   |  |  |  |  |  |  |
|          | (b)                                                          | Joint boxes for OPGW         |     |       |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                          |       |                                                                      |     |       |  |  |  |  |  |  |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------------------------------------------------------|-----|-------|--|--|--|--|--|--|
|          |                                                                                                                                                                                                                                                          | (i)   | OPGW-OPGW (A Type)                                                   | No. | 24    |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                          | (ii)  | OPGW-OPGW Cable ( B Type)                                            | No. | 3     |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                          | (iii) | OPGW-attaching Clamps                                                | No. | 1,620 |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                          | (iv)  | Fibre Optic Approach Cable                                           | km  | 6     |  |  |  |  |  |  |
|          | (c)                                                                                                                                                                                                                                                      |       | Test Equipment, Installation and Maintenance Tools                   |     | -     |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                          | -     | Fiber Optic Talk Set (Set comprised two units)                       | Set | 1     |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                          | -     | Fiber Optic Tool Kit                                                 | Set | 1     |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                          | -     | OTDR with range $\geq 400\text{km}$<br>Yokogawa AQ7260 or equivalent | Set | 1     |  |  |  |  |  |  |
|          | <b>Sub Total B :</b>                                                                                                                                                                                                                                     |       |                                                                      |     |       |  |  |  |  |  |  |
| <b>C</b> | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                             |       |                                                                      |     |       |  |  |  |  |  |  |
| 1        | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001        |       |                                                                      | Set | 726   |  |  |  |  |  |  |
| 2        | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002 |       |                                                                      | Set | 216   |  |  |  |  |  |  |
| 3        | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators                                                                      |       |                                                                      | Set | 432   |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                                                                                                      |     |   |  |  |  |  |  |  |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---|--|--|--|--|--|--|
|   | (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005                                                                                                                                                                                                                                                       |     |   |  |  |  |  |  |  |
| 4 | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower type 'TDT' including Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing (Note: No. of Insulators in each arm/string = 29 Nos.) as per specification drawing No. 4029/169/401C/TD/01E005a | Set | 8 |  |  |  |  |  |  |
| 5 | Furnish Single string Transposition Assembly Upright type "TDTU(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E006 (Note: No. of Insulators in each arm/string = 36 Nos.)            | Set | 4 |  |  |  |  |  |  |
| 6 | Furnish Single string Transposition Assembly Inverted type "TDTI(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E007 (Note: No. of Insulators in each arm/string = 36 Nos.)           | Set | 4 |  |  |  |  |  |  |
| 7 | Furnish Quad string special dead end assemblies type "SDE(4)" for Pre-RTV Coated 160kN E&M strength insulators for tower type "TDT" as per specification drawing No. 4029/169/401C/TD/01E008 (Note: No. of Insulators in each arm/string = 29 Nos.)                                                                                  | Set | 4 |  |  |  |  |  |  |
| 8 | Furnish Pipe Jumper Assembly type "VJT(4)" for Pre-RTV Coated 80kN E&M strength insulators for tower type "TDT" including jumper spacers & special jumper spacers as per specification drawing No. 4029/169/401C/TD/01E009                                                                                                           | Set | 4 |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                     |         |     |  |  |  |  |  |  |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|--|--|--|--|--|--|
|          | (Note: No. of Insulators in each arm/string = 54 Nos.)                                                                                                                                                                                              |         |     |  |  |  |  |  |  |
| 9        | Furnish Special Tension Clamp for tower type "TDT" as per specification                                                                                                                                                                             | Set     | 16  |  |  |  |  |  |  |
| 10       | Furnish Jumper Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                                 | Set     | 64  |  |  |  |  |  |  |
| 11       | Furnish Straight Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                               | Set     | 16  |  |  |  |  |  |  |
| 12       | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010  | Set     | 6   |  |  |  |  |  |  |
| 13       | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011 | Set     | 6   |  |  |  |  |  |  |
| 14       | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assembles (items C1 - 8 & C12-13) with Coulomb or ElecNET software.                                                                        | Lumpsum | 1   |  |  |  |  |  |  |
|          | <b>Sub-Total C :</b>                                                                                                                                                                                                                                |         |     |  |  |  |  |  |  |
| <b>D</b> | <b><u>Hardware for OPGW</u></b>                                                                                                                                                                                                                     |         |     |  |  |  |  |  |  |
| 1        | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                               | Set     | 242 |  |  |  |  |  |  |



|          |                                                                                                                                                                          |       |       |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|--|--|--|--|--|--|
| 2        | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                             | Set   | 24    |  |  |  |  |  |  |
| 3        | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                | Set   | 74    |  |  |  |  |  |  |
|          | <b>Sub-Total D :</b>                                                                                                                                                     |       |       |  |  |  |  |  |  |
| <b>E</b> | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |       |       |  |  |  |  |  |  |
| 1        | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 | No.   | 429   |  |  |  |  |  |  |
| 2        | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      | No.   | 215   |  |  |  |  |  |  |
| 3        | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No.   | 1,954 |  |  |  |  |  |  |
| 4        | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No.   | 6,620 |  |  |  |  |  |  |
| 5        | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor (See Note-3)                                                                                  | No.   | 1,655 |  |  |  |  |  |  |
| 6        | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No.   | 795   |  |  |  |  |  |  |
|          | <b>Sub-Total E :</b>                                                                                                                                                     |       |       |  |  |  |  |  |  |
|          |                                                                                                                                                                          |       |       |  |  |  |  |  |  |
| <b>F</b> | <b><u>Grounding Material</u></b>                                                                                                                                         |       |       |  |  |  |  |  |  |
| 1        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            | No.   | 316   |  |  |  |  |  |  |
| 2        | Furnish flat to cable connector.                                                                                                                                         | No.   | 316   |  |  |  |  |  |  |
| 3        | Furnish cable to rod connector.                                                                                                                                          | No.   | 316   |  |  |  |  |  |  |
| 4        | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             | Meter | 948   |  |  |  |  |  |  |
|          | <b>Sub-Total F :</b>                                                                                                                                                     |       |       |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                                                                                        |                         |                            |     |    |  |  |  |  |  |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------|-----|----|--|--|--|--|--|
| <b>G</b> | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                                                                                                                                                                    |                         |                            |     |    |  |  |  |  |  |
| <b>1</b> | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                                             |                         |                            |     |    |  |  |  |  |  |
|          | Furnish 500kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                         |                            |     |    |  |  |  |  |  |
|          | (a)                                                                                                                                                                                                                                                                                                                    | <u>Tower Type "DS1"</u> |                            |     |    |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (i)                     | Basic Tower Body           | No. | 12 |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (ii)                    | 2.0 m Single Leg Extension | No. | 8  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (iii)                   | 4.0 m Single Leg Extension | No. | 16 |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (iv)                    | 6.0 m Single Leg Extension | No. | 20 |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (v)                     | 8.0 m Single Leg Extension | No. | 16 |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (vi)                    | 6.0 m Body Extension       | No. | 1  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (vii)                   | Stubs                      | No. | 48 |  |  |  |  |  |
|          | (b)                                                                                                                                                                                                                                                                                                                    | <u>Tower Type "DA1"</u> |                            |     |    |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (i)                     | Basic Tower Body           | No. | 4  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (ii)                    | 2.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (iii)                   | 4.0 m Single Leg Extension | No. | 8  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (iv)                    | 6.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (v)                     | 8.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (vi)                    | 6.0 m Body Extension       | No. | 1  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (vii)                   | Stubs                      | No. | 16 |  |  |  |  |  |
|          | (c)                                                                                                                                                                                                                                                                                                                    | <u>Tower Type "DD1"</u> |                            |     |    |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (i)                     | Basic Tower Body           | No. | 4  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (ii)                    | 2.0 m Single Leg Extension | No. | 8  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (iii)                   | 4.0 m Single Leg Extension | No. | 8  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (iv)                    | 6.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (v)                     | 8.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                          |                              |     |        |  |  |  |  |  |  |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----|--------|--|--|--|--|--|--|
|   | (vi)                                                                                                                                                                                                                                                     | 6.0 m Body Extension         | No. | 1      |  |  |  |  |  |  |
|   | (vii)                                                                                                                                                                                                                                                    | Stubs                        | No. | 16     |  |  |  |  |  |  |
|   | (d)                                                                                                                                                                                                                                                      | <u>Tower Type "TDT"</u>      |     |        |  |  |  |  |  |  |
|   | (i)                                                                                                                                                                                                                                                      | Basic Tower Body             | No. | -      |  |  |  |  |  |  |
|   | (ii)                                                                                                                                                                                                                                                     | 6.0 m Single Leg Extension   | No. | -      |  |  |  |  |  |  |
|   | (iii)                                                                                                                                                                                                                                                    | Stubs                        | No. | -      |  |  |  |  |  |  |
|   | <b><u>Conductor and OPGW (With Associated Equipment)</u></b>                                                                                                                                                                                             |                              |     |        |  |  |  |  |  |  |
| 2 | Furnish 795 KCM ACSR "Drake" Conductor                                                                                                                                                                                                                   |                              | km  | 124.80 |  |  |  |  |  |  |
| 3 | Furnish                                                                                                                                                                                                                                                  |                              |     |        |  |  |  |  |  |  |
|   | (a)                                                                                                                                                                                                                                                      | OPGW with at least 24 fibers | km  | 15     |  |  |  |  |  |  |
|   | (b)                                                                                                                                                                                                                                                      | Joint boxes for OPGW         |     |        |  |  |  |  |  |  |
|   | (i)                                                                                                                                                                                                                                                      | OPGW-OPGW (A Type)           | No. | 2      |  |  |  |  |  |  |
|   | (ii)                                                                                                                                                                                                                                                     | OPGW-OPGW Cable ( B Type)    | No. | -      |  |  |  |  |  |  |
|   | (iii)                                                                                                                                                                                                                                                    | OPGW-attaching Clamps        | No. | 120    |  |  |  |  |  |  |
|   | (iv)                                                                                                                                                                                                                                                     | Fibre Optic Approach Cable   | km  | -      |  |  |  |  |  |  |
|   | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                             |                              |     |        |  |  |  |  |  |  |
| 4 | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001        |                              | Set | 72     |  |  |  |  |  |  |
| 5 | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002 |                              | Set | 48     |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                                                    |     |    |  |  |  |  |  |  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|--|--|--|--|--|--|
| 6  | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005 | Set | 96 |  |  |  |  |  |  |
| 7  | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                 | Set | 6  |  |  |  |  |  |  |
| 8  | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                | Set | 6  |  |  |  |  |  |  |
|    | <b><u>Hardware for OPGW</u></b>                                                                                                                                                                                                                                    |     |    |  |  |  |  |  |  |
| 9  | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                                              | Set | 24 |  |  |  |  |  |  |
| 10 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                                                                                                                       | Set | 3  |  |  |  |  |  |  |
| 11 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                                                                                                          | Set | 16 |  |  |  |  |  |  |
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                                                                                                              |     |    |  |  |  |  |  |  |
| 12 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                                                                                                           | No. | 43 |  |  |  |  |  |  |
| 13 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                                                                                                                | No. | 21 |  |  |  |  |  |  |

|    |                                                                                                                                                                          |        |     |  |  |  |  |  |   |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----|--|--|--|--|--|---|
| 14 | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No.    | 475 |  |  |  |  |  |   |
| 15 | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No.    | 922 |  |  |  |  |  |   |
| 16 | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor                                                                                               | No.    | 230 |  |  |  |  |  |   |
| 17 | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No.    | 115 |  |  |  |  |  |   |
| 18 | 60 ton hydraulic compressor                                                                                                                                              | No.    | 1   |  |  |  |  |  |   |
| 19 | 100 ton hydraulic compressor                                                                                                                                             | No.    | 1   |  |  |  |  |  |   |
| 20 | Compression dies for "Drake" conductor                                                                                                                                   | No.    | 2   |  |  |  |  |  |   |
| 21 | Filler Compound, a carton of 100, 0.4536 kg tubes                                                                                                                        | Carton | 1   |  |  |  |  |  |   |
| 22 | Electrical Joint compound, a carton of 100, 0.23 kg tubes.                                                                                                               | Carton | 1   |  |  |  |  |  |   |
|    | <b><u>Grounding Material</u></b>                                                                                                                                         |        |     |  |  |  |  |  |   |
| 23 | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            | No.    | 40  |  |  |  |  |  |   |
| 24 | Furnish flat to cable connector.                                                                                                                                         | No.    | 40  |  |  |  |  |  |   |
| 25 | Furnish cable to rod connector.                                                                                                                                          | No.    | 40  |  |  |  |  |  |   |
| 26 | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             | Meter  | 120 |  |  |  |  |  |   |
|    | <b>Sub-Total of G :</b>                                                                                                                                                  |        |     |  |  |  |  |  |   |
|    | Total of Item A                                                                                                                                                          |        |     |  |  |  |  |  |   |
|    | Total of Item B                                                                                                                                                          |        |     |  |  |  |  |  | - |
|    | Total of Item C                                                                                                                                                          |        |     |  |  |  |  |  | - |
|    | Total of Item D                                                                                                                                                          |        |     |  |  |  |  |  | - |
|    | Total of Item E                                                                                                                                                          |        |     |  |  |  |  |  | - |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                 |  |  |  |  |  |   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--|--|--|--|--|---|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Total of Item F |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Total of Item G |  |  |  |  |  | - |
| <b>Total of Column 9 to be forwarded to Grand Summary</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                 |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                 |  |  |  |  |  |   |
| <p>* The Bidder shall specify the type of insulator being offered.</p> <p><b>Notes:</b></p> <p>1 Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types DS1, DA1, DD1, and TDT, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly.</p> <p>2 The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.</p> <p>3 The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.</p> <p>4 The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.</p> <p>5 The contractor shall be responsible to furnish the tower material, OPGW, conductor, insulators, accessories, dampers &amp; hardware for conductor and OPGW, for completion of line in all respects. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.</p> <p>6 The contractor shall transport, unload and stack leftover/additional material from site to NGC designated Warehouse/Store at its own cost.</p> <p>7 Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.</p> <p>8 The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully read before filling up the schedule of prices.</p> <p>9 Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.</p> <p>10 Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.</p> <p>11 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.</p> |                 |  |  |  |  |  |   |

**Signature of Bidder**

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-I: 500 kV D/C Ludewala-Faisalabad West – Section A (Approx. 51 km)  
Schedule No.3 - Design Services**

| Item                                                         | Description | Qty. | Unit Price <sup>1</sup><br>Local<br>Currency | Total Price | Total<br>Provincial<br>Sales Tax |
|--------------------------------------------------------------|-------------|------|----------------------------------------------|-------------|----------------------------------|
| 1                                                            | 2           | 3    | 4                                            | 5 = 3 x 4   | 6                                |
| 1                                                            |             | Lot  |                                              |             |                                  |
| <b>NOT APPLICABLE</b>                                        |             |      |                                              |             |                                  |
| 2                                                            |             | Lot  |                                              |             |                                  |
| 3                                                            |             | Lot  |                                              |             |                                  |
| <b>TOTAL Column 5 to be carried forward to Grand Summary</b> |             |      |                                              |             |                                  |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>1</sup>*Specify currency in accordance ITB 12.*



**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme  
Lot-I: 500 kV D/C Ludewala–Faisalabad West —Section A (Approx. 51 km)**

**SCHEDULE NO.4 - INSTALLATION AND OTHER SERVICES**

**(INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)**

| Item No. | Description                                                                               | Unit     | Qty | Unit Price (PKR) | Total Price (PKR) Including all Custom duties, taxes and other levies etc. w/o Provincial Sales Tax | Total Provincial Sales tax (PST) in PKR |
|----------|-------------------------------------------------------------------------------------------|----------|-----|------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------|
| 1        | 2                                                                                         | 3        | 4   | 5                | 6=4*5                                                                                               | 7                                       |
|          | <b>INSTALLATION (INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)</b> |          |     |                  |                                                                                                     |                                         |
| A        | <u>Survey</u>                                                                             |          |     |                  |                                                                                                     |                                         |
| 1        | Clearing Right of Way (ROW)                                                               | Lump Sum | 1   |                  |                                                                                                     |                                         |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |     |  |   |   |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----|--|---|---|
| 2        | Validation of already established centre line prior to foundation construction and preparation of as-built plan & profile drawings of the already prepared plan & profile drawings using PLS-CADD and construction structure lists (to be provided to the Contractor after award of contract) of the constructed transmission line after incorporating all the changes and submitted to the Project Manager. In case of route diversion, payment of the diverted portion will be made as per item A.3 | km        | 51  |  |   |   |
| 3        | Route alignment and detailed surveying of diverted portion not limited to chainage and leveling, preparation of plan & profile drawings, spotting of towers and preparation of construction structure list & Latitude & Longitude with hand held GPS of each tower location                                                                                                                                                                                                                           | km        | 5.1 |  |   |   |
|          | <b>Sub-Total A:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |     |  | - | - |
| <b>B</b> | <b><u>Sub-soil Investigations:</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |     |  |   |   |
|          | Sub-Soil Investigation for T/Line at (ii) and confirmatory sub-soil Investigation in varied soil/boulder/rock (including laboratory tests) as per Specifications (Technical Provisions for Construction Clause 10.2) and submission of Sub-Soil Investigation Report.                                                                                                                                                                                                                                 |           |     |  |   |   |
| (a)      | From NSL to depth of 15 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Lin. Mtr. | 75  |  |   |   |
| (b)      | From 15 m to depth of 25 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Lin. Mtr. | 30  |  |   |   |
| (c)      | Hand Auger upto depth of 10m                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Lin. Mtr. | 70  |  |   |   |
|          | <b>Sub-Total B:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |     |  |   |   |
| <b>C</b> | <b><u>Foundations</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |     |  |   |   |

|  |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |    |  |  |  |
|--|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----|--|--|--|
|  |       | Reinforced Concrete Spread Foundations (4 legs) complete in all respect in varied soil as well as boulders/rock complete with supply of materials including alignment, peg marking, access, preparatory works, excavation, blasting, leveling, grading of tower site, cutting, dewatering, shuttering, reinforcement, concreting (using Sulphate Resistance Cement conforming to ASTM C-150 Type-V), lean concrete (if required), curing, backfilling of foundations after concreting with excavated/borrowed earth (irrespective of lead), application of three (03) coats hot bitumen (ExpanProof* 10 – Fospak bitumen and compaction of backfill material in layers, stub setting and site restoration etc. including tower staking (Latitude & Longitude with hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type as per drawings and specifications: |            |    |  |  |  |
|  | (a)   | DS1 (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G010                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |    |  |  |  |
|  | (i)   | Foundation Type D1 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 25 |  |  |  |
|  | (ii)  | Foundation Type D2 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 11 |  |  |  |
|  | (iii) | Foundation Type D3 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 1  |  |  |  |
|  | (iv)  | Foundation Type S (Semi-Submerged)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Foundation | 35 |  |  |  |
|  | (v)   | Foundation Type W (Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Foundation | 0  |  |  |  |
|  | (b)   | DA1 (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |    |  |  |  |
|  | (i)   | Foundation Type D1 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 2  |  |  |  |
|  | (ii)  | Foundation Type D2 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 2  |  |  |  |
|  | (iii) | Foundation Type S (Semi-Submerged)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Foundation | 4  |  |  |  |
|  | (iv)  | Foundation Type D3 (Dry) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Foundation | 0  |  |  |  |
|  | (v)   | Foundation Type W (Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Foundation | 0  |  |  |  |
|  | (c)   | DD1 (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G012                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |    |  |  |  |
|  | (i)   | Foundation Type D1 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 1  |  |  |  |
|  | (ii)  | Foundation Type S (Semi-Submerged)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Foundation | 2  |  |  |  |

|          |                                |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |      |  |  |  |
|----------|--------------------------------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------|--|--|--|
|          |                                | (iii) | Foundation Type W (Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Foundation | 0    |  |  |  |
|          | (d)                            |       | TDT (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G020                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |      |  |  |  |
|          |                                | (i)   | Foundation Type D1 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 1    |  |  |  |
|          |                                |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |      |  |  |  |
|          | <b>Sub-Total C:</b>            |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |      |  |  |  |
| <b>D</b> | <b><u>Pile Foundations</u></b> |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |      |  |  |  |
|          | D-1                            |       | Reinforced concrete pile foundations (cast in situ installation) complete in all type of soil as well as boulders/gravels/rock with supply of materials including excavation, drilling/boring, shuttering, reinforcement, concreting, bitumen coating, backfilling, installation of Stubs, tower grounding, site clearing etc. using Sulphate Resistance Cement conforming to ASTM C-150 Type-V shall be used including tower staking (Latitude & Longitude with RTK/hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type: |            |      |  |  |  |
|          | (a)                            |       | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DS1, and drawing No. <b>4029/169/TLC-22/TD/01G014</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Foundation | 45   |  |  |  |
|          | (b)                            |       | Reinforced concrete single pile per footing 900 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G014</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |      |  |  |  |
|          |                                | (i)   | Pile shaft upto depth of 15 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Lin.mtr    | 2700 |  |  |  |
|          |                                | (ii)  | Pile shaft depth 15 - 20 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lin.mtr    | 780  |  |  |  |
|          |                                | (iii) | Pile shaft depth 20 - 25 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lin.mtr    | 100  |  |  |  |
|          | (c)                            |       | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DA1, and drawing No. <b>4029/169/TLC-22/TD/01G015</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Foundation | 7    |  |  |  |

|  |       |                                                                                                                                                           |            |     |  |  |  |
|--|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|--|--|--|
|  | (d)   | Reinforced concrete single pile per footing 1200 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G015</b> (including steel liner/casing), if required. |            |     |  |  |  |
|  | (i)   | Pile shaft upto depth of 15 m                                                                                                                             | Lin.mtr    | 420 |  |  |  |
|  | (ii)  | Pile shaft depth 15 - 20 m                                                                                                                                | Lin.mtr    | 140 |  |  |  |
|  | (iii) | Pile shaft depth 20 - 25 m                                                                                                                                | Lin.mtr    | 140 |  |  |  |
|  | (e)   | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DD1/DT1, and drawing No. <b>4029/169/TLC-22/TD/01G016</b>            | Foundation | 10  |  |  |  |
|  | (f)   | Reinforced concrete single pile per footing 1500 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G016</b> (including steel liner/casing), if required. |            |     |  |  |  |
|  | (i)   | Pile shaft upto depth of 20 m                                                                                                                             | Lin.mtr    | 800 |  |  |  |
|  | (ii)  | Pile shaft depth 20 - 25 m                                                                                                                                | Lin.mtr    | 200 |  |  |  |
|  | (iii) | Pile shaft depth 25 - 30 m                                                                                                                                | Lin.mtr    | 200 |  |  |  |
|  | D-2   | Pile load test in compression confirming to ASTM D1143 / D1143M and in uplift confirming to ASTM D3689 / D3689M at 2.5 times of tower foundation loads    |            |     |  |  |  |
|  | (i)   | DS1 (In Compression)                                                                                                                                      | Pile       | 1   |  |  |  |
|  | (ii)  | DS1 (In Tension/Uplift)                                                                                                                                   | Pile       | 1   |  |  |  |
|  | (iii) | DD1/DT1 (In Compression)                                                                                                                                  | Pile       | 1   |  |  |  |
|  | (iv)  | DD1/DT1 (In Tension/Uplift)                                                                                                                               | Pile       | 1   |  |  |  |

|          |     |     |                                                                                                                                                                                                                                                                  |            |       |  |  |  |
|----------|-----|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------|--|--|--|
|          |     | (v) | Reinforced concrete single Test pile per footing 900 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G014</b> (including steel liner/casing), if required.                                                                                                    |            | 1     |  |  |  |
|          |     | (a) | Pile shaft upto depth of 20 m                                                                                                                                                                                                                                    | Lin.mtr    | 40    |  |  |  |
|          |     | (b) | Pile shaft depth 20 - 25 m                                                                                                                                                                                                                                       | Lin.mtr    | 10    |  |  |  |
|          |     | (v) | Reinforced concrete single Test pile per footing 1500 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G016</b> (including steel liner/casing), if required.                                                                                                   |            | 1     |  |  |  |
|          |     | (c) | Pile shaft upto depth of 20 m                                                                                                                                                                                                                                    | Lin.mtr    | 40    |  |  |  |
|          |     | (d) | Pile shaft depth 20 - 25 m                                                                                                                                                                                                                                       | Lin.mtr    | 10    |  |  |  |
|          |     | (e) | Pile shaft depth 25 - 30 m                                                                                                                                                                                                                                       | Lin.mtr    | 10    |  |  |  |
|          | D-6 |     | Sonic Integrity Test at pile foundation confirming to ASTM D5882                                                                                                                                                                                                 | No.        | 40    |  |  |  |
|          |     |     | <b>Sub-Total D:</b>                                                                                                                                                                                                                                              |            |       |  |  |  |
| <b>E</b> |     |     | <b><u>Erection of Steel Towers</u></b>                                                                                                                                                                                                                           |            |       |  |  |  |
| 1        |     |     | Transport and Install 500kV double circuit tower types 'DS1', 'DA1', 'DD1' & TDT with all accessories i.e anti climbing devices, aerial markers number plates, danger signs, phase plates, Bird Guards etc. in accordance with requirements of Bidding Documents | Ton        | 5,026 |  |  |  |
| 2        |     |     | Welding of erected tower bolts & nuts after final inspection upto height of 8.0 m from top of foundation chimney as per specification drawing                                                                                                                    | Each tower | 158   |  |  |  |
|          |     |     | <b>Sub-Total E:</b>                                                                                                                                                                                                                                              |            |       |  |  |  |
| <b>F</b> |     |     | <b><u>Stringing of Conductor and OPGW</u></b>                                                                                                                                                                                                                    |            |       |  |  |  |

|          |                                                                                                                                                                                                                                                                                 |                    |      |  |  |  |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------|--|--|--|
| 1        | Transport & Install 795KCM ACSR Drake for quad conductor configuration insulator hanging, hardware assemblies, accessories & dampers etc. complete in all respects as per specifications & approved drawings and methodology.                                                   | km D/C Quad Bundle | 51   |  |  |  |
| 2        | Transport & Install OPGW including installation of drop down lengths for joint boxes at the towers along with allied hardware material including hardware assemblies, joint boxes accessories, dampers etc. complete in all respects as per specifications & approved drawings. | km (on Both Peaks) | 51   |  |  |  |
|          | <b>Sub-Total F:</b>                                                                                                                                                                                                                                                             |                    |      |  |  |  |
| <b>G</b> | <b><u>Testing &amp; Commissioning</u></b>                                                                                                                                                                                                                                       |                    |      |  |  |  |
| 1        | Testing and commissioning of the line                                                                                                                                                                                                                                           | Lumpsum            | 1    |  |  |  |
|          | <b>Sub-Total G:</b>                                                                                                                                                                                                                                                             |                    |      |  |  |  |
| <b>H</b> | <b><u>ENVIRONMENTAL AND SOCIAL SAFEGUARDS</u></b>                                                                                                                                                                                                                               |                    |      |  |  |  |
| 1        | Tree Plantation (Minimum height 4 feet)                                                                                                                                                                                                                                         | Lumpsum            | 2000 |  |  |  |
| 2        | Water quality monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route.                                                                                                                                            | Lumpsum            | 21   |  |  |  |
| 3        | Ambient Air monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route.                                                                                                                                              | Unit               | 21   |  |  |  |
| 4        | Noise monitoring / analysis / measurement on quarterly basis for the whole project period at three locations along the TL route.                                                                                                                                                | No.                | 21   |  |  |  |
|          | <b>Sub-Total H:</b>                                                                                                                                                                                                                                                             |                    |      |  |  |  |
| <b>I</b> | <b><u>INSTALLATION SERVICES FOR ADDITIONAL WORK</u></b>                                                                                                                                                                                                                         |                    |      |  |  |  |
| 1        | Grading/Cutting/Excavation (Dry Soil)                                                                                                                                                                                                                                           | Cu. m.             | 80   |  |  |  |
| 2        | Excavation (semi-submerged soil)                                                                                                                                                                                                                                                | Cu. m.             | 40   |  |  |  |

|                                                                                                                                                                                                                                                                                                                                                                                           |                                                                             |        |      |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|--------|------|--|--|--|
| 3                                                                                                                                                                                                                                                                                                                                                                                         | Excavation (submerged soil)                                                 | Cu. m. | 60   |  |  |  |
| 4                                                                                                                                                                                                                                                                                                                                                                                         | Blasting/Cutting/Excavation/Grading (boulder/Rock)                          | Cu. m. | 80   |  |  |  |
| 5                                                                                                                                                                                                                                                                                                                                                                                         | Concrete (3000 psi at 28 days) furnished and installed                      | Cu. m. | 150  |  |  |  |
| 6                                                                                                                                                                                                                                                                                                                                                                                         | Concrete (4000 psi at 28 days) furnished and installed                      | Cu. m. | 150  |  |  |  |
| 7                                                                                                                                                                                                                                                                                                                                                                                         | Reinforcing Bars furnished and installed (Grade-60)                         | kg     | 1500 |  |  |  |
| 8                                                                                                                                                                                                                                                                                                                                                                                         | Overhaul from Borrow and Compaction (regardless of the distance for borrow) | Cu. m. | 150  |  |  |  |
| 9                                                                                                                                                                                                                                                                                                                                                                                         | Lean concrete furnished and installed (2000 psi strength at 28 days)        | Cu. m. | 120  |  |  |  |
| 10                                                                                                                                                                                                                                                                                                                                                                                        | Compacted crush+sand (50:50 ratio) installed under footings                 | Cu. m. | 50   |  |  |  |
| 11                                                                                                                                                                                                                                                                                                                                                                                        | Bitumen coating for footing                                                 | Sq. m  | 100  |  |  |  |
| 12                                                                                                                                                                                                                                                                                                                                                                                        | Compacted Backfill                                                          | Cu. m. | 150  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                           | <b>Sub-Total I:</b>                                                         |        |      |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                           | <b>Total of Item A</b>                                                      |        |      |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                           | <b>Total of Item B</b>                                                      |        |      |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                           | <b>Total of Item C</b>                                                      |        |      |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                           | <b>Total of Item D</b>                                                      |        |      |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                           | <b>Total of Item E</b>                                                      |        |      |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                           | <b>Total of Item F</b>                                                      |        |      |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                           | <b>Total of Item G</b>                                                      |        |      |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                           | <b>Total of Item H</b>                                                      |        |      |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                           | <b>Total of Item I</b>                                                      |        |      |  |  |  |
| <b>Total (Column 6) to be carried forward to Grand Summary</b>                                                                                                                                                                                                                                                                                                                            |                                                                             |        |      |  |  |  |
| <p><b><u>Notes:</u></b></p> <p>1 The quantities mentioned in the BOQ are estimated quantities. These quantities are to be used for bid evaluation purpose only. The actual quantities may vary depending upon detailed engineering and approved drawings. However, the unit rates for material and service quoted in the BOQ/ bid shall remain firm and final if design is unchanged.</p> |                                                                             |        |      |  |  |  |



- 2 Price of any other item specifically not covered in the Price Schedules but is required for the completion, commissioning and operation of the transmission line shall be deemed to be included in the Price Schedules.
- 3 In case of failure by the bidder to fill the price of Sales Tax in relevant column, the quoted price of the bidder will be considered inclusive of Sales Tax applicable as per Lax and relevant provisions of the Bidding Documents. In case the bidder takes deviation or mention that prices are exclusive of PST, his bid shall be considered as non-responsive.
- 4 Foundation means four legs of tower.
- 5 An allowance of two percent (2%) of the total installed quantity will be permitted for sag, jumpers and wastage for the conductor, one percent (1%) for OPGW and two percent (2%) for lossage of nuts, bolts and washers (for towers only); and one percent (1%) for insulator breakage. These allowances are the maximum permissible and in case of wastage less than these limits all excess material shall be returned to NGC storage yards by the Contractor. For quantities in excess of these limits, the Contractor shall replace or reimburse NGC for the loss. All unused, above allowable limits of waste materials and packing wood are the property of NGC and shall be returned to NGC storage yards by the Contractor.
- 6 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.
- 7 The Bidder shall quote prices against all items, including those for which the specified quantity is "0". No item shall be left blank or unpriced in the Price Schedule.
- 8 Pile Foundation design will be release after the submission of Pile load test Report.
- 9 Location for Sonic Integrity and sonic integrity test report approval will be accorded by the office of DG (C&SE) NGC.

**Name of Bidder**

**Signature of Bidder**

| <b>Design, Manufacture, Procurement, Supply, Laying, Installation, Testing &amp; Commissioning of<br/>500 kV Transmission Lines for C-5 Power Evacuation Scheme<br/>Lot-I: 500 kV D/C Ludewala–Faisalabad West —Section A (Approx. 51 km)</b> |                                                                                                  |                                       |                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------|-------------------------------------------|
| <b><u>SCHEDULE NO. 5 - GRAND SUMMARY</u></b>                                                                                                                                                                                                  |                                                                                                  |                                       |                                           |
| <b>Sr.<br/>No.</b>                                                                                                                                                                                                                            | <b>Description</b>                                                                               | <b>Bid Prices</b>                     |                                           |
|                                                                                                                                                                                                                                               |                                                                                                  | <b>Foreign Currency<br/>Component</b> | <b>Local Currency<br/>Component (PKR)</b> |
| 1                                                                                                                                                                                                                                             | Total Schedule No. 1 Plant and Mandatory Spare Parts Supplied from Abroad                        |                                       |                                           |
| 2                                                                                                                                                                                                                                             | Total Schedule No. 2 Plant and Mandatory Spare Parts Supplied from Within the Employer's Country |                                       |                                           |
| 3                                                                                                                                                                                                                                             | Total Schedule No. 3 Design Services                                                             |                                       |                                           |
| 4                                                                                                                                                                                                                                             | Total Schedule No. 4 Installation and Other Services                                             |                                       |                                           |
| 5                                                                                                                                                                                                                                             | Provisional Sum                                                                                  |                                       | 2,800 Million                             |
| <b>GRAND TOTAL to be carried forward to Letter of Price Bid</b>                                                                                                                                                                               |                                                                                                  |                                       |                                           |

**Name of Bidder** \_\_\_\_\_

**Signature of Bidder** \_\_\_\_\_

- 1 Specify the currency in accordance with ITB 12 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-I: 500 kV D/C Ludewala-Faisalabad West – Section A (Approx. 51 km)**

**Schedule No. 6 - Recommended Spare Parts**

| Item | Description    | Qty | Unit Price                              |                                                 | Total Price                  |                                |
|------|----------------|-----|-----------------------------------------|-------------------------------------------------|------------------------------|--------------------------------|
|      |                |     | EXW<br>Local Parts<br>Local<br>Currency | CIP<br>Imported<br>Parts<br>Foreign<br>Currency | Local<br>Currency<br>Portion | Foreign<br>Currency<br>Portion |
| 1    | 2              | 3   | 4                                       | 5                                               | 6 = 3 x 4                    | 7 = 3 x 5                      |
|      | NOT APPLICABLE |     |                                         |                                                 |                              |                                |
|      |                |     |                                         |                                                 |                              |                                |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

## **Schedules of Rates and Prices**

### **(LOT-II)**

| Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme |                                                                                                                                                                                                                                                                                                                         |                            |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------|------|----------|-----------------------------------|-----------|------------------------------------|-----------|-----------------------------|--------------------------------|----------|----------------|
| Lot-II: 500 kV D/C Ludewala–Faisalabad West —Section B (Approx. 49 km)                                                                               |                                                                                                                                                                                                                                                                                                                         |                            |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| SCHEDULE NO.1- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM ABROAD                                                                                  |                                                                                                                                                                                                                                                                                                                         |                            |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| Item No.                                                                                                                                             | Description                                                                                                                                                                                                                                                                                                             |                            | Code Country of Origin | Unit | Quantity | Unit Price (CIF Pakistan Seaport) |           | Total Price (CIF Pakistan Seaport) |           | Total Inland Transportation | Total Price CIP (Project Site) |          | Taxes & Duties |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                         |                            |                        |      |          | CFR                               | Insurance | CFR                                | Insurance |                             | FCC                            | LCC      | Local Currency |
| 1                                                                                                                                                    | 2                                                                                                                                                                                                                                                                                                                       |                            | 3                      | 4    | 5        | 6                                 | 7         | 8=5 x 6                            | 9 = 5 x 7 | 10                          | 11=8                           | 12= 9+10 | 13             |
| A                                                                                                                                                    | Steel Towers                                                                                                                                                                                                                                                                                                            |                            |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| 1                                                                                                                                                    | Furnish 500 kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                            |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      | (a)                                                                                                                                                                                                                                                                                                                     | Tower Type "DS1"           |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      | (i)                                                                                                                                                                                                                                                                                                                     | Basic Tower Body           |                        | No.  | 103      |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      | (ii)                                                                                                                                                                                                                                                                                                                    | 2.0 m Single Leg Extension |                        | No.  | 20       |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      | (iii)                                                                                                                                                                                                                                                                                                                   | 4.0 m Single Leg Extension |                        | No.  | 108      |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      | (iv)                                                                                                                                                                                                                                                                                                                    | 6.0 m Single Leg Extension |                        | No.  | 144      |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      | (v)                                                                                                                                                                                                                                                                                                                     | 8.0 m Single Leg Extension |                        | No.  | 140      |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      | (vi)                                                                                                                                                                                                                                                                                                                    | 6.0 m Body Extension       |                        | No.  | 4        |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      | (vii)                                                                                                                                                                                                                                                                                                                   | Stubs                      |                        | No.  | 412      |                                   |           |                                    |           |                             |                                |          |                |

|          |                                                              |                              |                            |  |     |       |  |  |  |  |  |  |  |
|----------|--------------------------------------------------------------|------------------------------|----------------------------|--|-----|-------|--|--|--|--|--|--|--|
|          | (b)                                                          | <u>Tower Type "DA1"</u>      |                            |  |     |       |  |  |  |  |  |  |  |
|          |                                                              | (i)                          | Basic Tower Body           |  | No. | 25    |  |  |  |  |  |  |  |
|          |                                                              | (ii)                         | 2.0 m Single Leg Extension |  | No. | -     |  |  |  |  |  |  |  |
|          |                                                              | (iii)                        | 4.0 m Single Leg Extension |  | No. | 32    |  |  |  |  |  |  |  |
|          |                                                              | (iv)                         | 6.0 m Single Leg Extension |  | No. | 12    |  |  |  |  |  |  |  |
|          |                                                              | (v)                          | 8.0 m Single Leg Extension |  | No. | 56    |  |  |  |  |  |  |  |
|          |                                                              | (vi)                         | 6.0 m Body Extension       |  | No. | 14    |  |  |  |  |  |  |  |
|          |                                                              | (vii)                        | Stubs                      |  | No. | 100   |  |  |  |  |  |  |  |
|          | (c)                                                          | <u>Tower Type "DD1"</u>      |                            |  |     |       |  |  |  |  |  |  |  |
|          |                                                              | (i)                          | Basic Tower Body           |  | No. | 23    |  |  |  |  |  |  |  |
|          |                                                              | (ii)                         | 2.0 m Single Leg Extension |  | No. | -     |  |  |  |  |  |  |  |
|          |                                                              | (iii)                        | 4.0 m Single Leg Extension |  | No. | 4     |  |  |  |  |  |  |  |
|          |                                                              | (iv)                         | 6.0 m Single Leg Extension |  | No. | 44    |  |  |  |  |  |  |  |
|          |                                                              | (v)                          | 8.0 m Single Leg Extension |  | No. | 44    |  |  |  |  |  |  |  |
|          |                                                              | (vi)                         | 6.0 m Body Extension       |  | No. | 14    |  |  |  |  |  |  |  |
|          |                                                              | (vii)                        | Stubs                      |  | No. | 92    |  |  |  |  |  |  |  |
|          | (d)                                                          | <u>Tower Type "TDT"</u>      |                            |  |     |       |  |  |  |  |  |  |  |
|          |                                                              | (i)                          | Basic Tower Body           |  | No. | 2     |  |  |  |  |  |  |  |
|          |                                                              | (ii)                         | 8.0 m Single Leg Extension |  | No. | 8     |  |  |  |  |  |  |  |
|          |                                                              | (iii)                        | Stubs                      |  | No. | 8     |  |  |  |  |  |  |  |
|          | <b>Sub-Total A :</b>                                         |                              |                            |  |     |       |  |  |  |  |  |  |  |
| <b>B</b> | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                              |                            |  |     |       |  |  |  |  |  |  |  |
| 1        | Furnish 795 KCM ACSR "Drake" Conductor                       |                              |                            |  | km  | 1,200 |  |  |  |  |  |  |  |
| 2        | Furnish                                                      |                              |                            |  |     |       |  |  |  |  |  |  |  |
|          | (a)                                                          | OPGW with at least 24 fibers |                            |  | km  | 115   |  |  |  |  |  |  |  |
|          | (b)                                                          | Joint boxes for OPGW         |                            |  |     |       |  |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                          |                                                                      |     |       |  |  |  |  |  |  |  |  |  |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----|-------|--|--|--|--|--|--|--|--|--|
|          | (i)                                                                                                                                                                                                                                                      | OPGW-OPGW (A Type)                                                   | No. | 23    |  |  |  |  |  |  |  |  |  |
|          | (ii)                                                                                                                                                                                                                                                     | OPGW-OPGW Cable ( B Type)                                            | No. | 3     |  |  |  |  |  |  |  |  |  |
|          | (iii)                                                                                                                                                                                                                                                    | OPGW-attaching Clamps                                                | No. | 1,560 |  |  |  |  |  |  |  |  |  |
|          | (iv)                                                                                                                                                                                                                                                     | Fibre Optic Approach Cable                                           | km  | 6     |  |  |  |  |  |  |  |  |  |
|          | (c)                                                                                                                                                                                                                                                      | Test Equipment, Installation and Maintenance Tools                   |     | -     |  |  |  |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                        | Fiber Optic Talk Set (Set comprised two units)                       | Set | 1     |  |  |  |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                        | Fiber Optic Tool Kit                                                 | Set | 1     |  |  |  |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                        | OTDR with range $\geq 400\text{km}$<br>Yokogawa AQ7260 or equivalent | Set | 1     |  |  |  |  |  |  |  |  |  |
|          | <b>Sub Total B :</b>                                                                                                                                                                                                                                     |                                                                      |     |       |  |  |  |  |  |  |  |  |  |
| <b>C</b> | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                             |                                                                      |     |       |  |  |  |  |  |  |  |  |  |
| 1        | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001        |                                                                      | Set | 618   |  |  |  |  |  |  |  |  |  |
| 2        | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002 |                                                                      | Set | 288   |  |  |  |  |  |  |  |  |  |
| 3        | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per                                         |                                                                      | Set | 576   |  |  |  |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                                                                                                      |  |     |    |  |  |  |  |  |  |  |  |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|----|--|--|--|--|--|--|--|--|
|   | specification drawing No.<br>4029/169/401C/TD/01E005                                                                                                                                                                                                                                                                                 |  |     |    |  |  |  |  |  |  |  |  |
| 4 | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower type 'TDT' including Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing (Note: No. of Insulators in each arm/string = 29 Nos.) as per specification drawing No. 4029/169/401C/TD/01E005a |  | Set | 16 |  |  |  |  |  |  |  |  |
| 5 | Furnish Single string Transposition Assembly Upright type "TDTU(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E006 (Note: No. of Insulators in each arm/string = 36 Nos.)            |  | Set | 8  |  |  |  |  |  |  |  |  |
| 6 | Furnish Single string Transposition Assembly Inverted type "TDTI(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E007 (Note: No. of Insulators in each arm/string = 36 Nos.)           |  | Set | 8  |  |  |  |  |  |  |  |  |
| 7 | Furnish Quad string special dead end assemblies type "SDE(4)" for Pre-RTV Coated 160kN E&M strength insulators for tower type "TDT" as per specification drawing No. 4029/169/401C/TD/01E008 (Note: No. of Insulators in each arm/string = 29 Nos.)                                                                                  |  | Set | 8  |  |  |  |  |  |  |  |  |



|                      |                                                                                                                                                                                                                                                                                      |  |         |     |  |  |  |  |  |  |  |  |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------|-----|--|--|--|--|--|--|--|--|
| 8                    | Furnish Pipe Jumper Assembly type "VJT(4)" for Pre-RTV Coated 80kN E&M strength insulators for tower type "TDT" including jumper spacers & special jumper spacers as per specification drawing No. 4029/169/401C/TD/01E009<br>(Note: No. of Insulators in each arm/string = 54 Nos.) |  | Set     | 8   |  |  |  |  |  |  |  |  |
| 9                    | Furnish Special Tension Clamp for tower type "TDT" as per specification                                                                                                                                                                                                              |  | Set     | 32  |  |  |  |  |  |  |  |  |
| 10                   | Furnish Jumper Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                                                                  |  | Set     | 128 |  |  |  |  |  |  |  |  |
| 11                   | Furnish Straight Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                                                                |  | Set     | 32  |  |  |  |  |  |  |  |  |
| 12                   | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                                   |  | Set     | 6   |  |  |  |  |  |  |  |  |
| 13                   | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                                  |  | Set     | 6   |  |  |  |  |  |  |  |  |
| 14                   | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assemblies (items C1 - 8 & C12-13) with Coulomb or ElecNET software.                                                                                                        |  | Lumpsum | 1   |  |  |  |  |  |  |  |  |
| <b>Sub-Total C :</b> |                                                                                                                                                                                                                                                                                      |  |         |     |  |  |  |  |  |  |  |  |
| <b>D</b>             | <b><u>Hardware for OPGW</u></b>                                                                                                                                                                                                                                                      |  |         |     |  |  |  |  |  |  |  |  |

|          |                                                                                                                                                                          |  |     |       |  |  |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|-------|--|--|--|--|--|--|--|--|
| 1        | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                    |  | Set | 206   |  |  |  |  |  |  |  |  |
| 2        | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                             |  | Set | 23    |  |  |  |  |  |  |  |  |
| 3        | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                |  | Set | 100   |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total D :</b>                                                                                                                                                     |  |     |       |  |  |  |  |  |  |  |  |
| <b>E</b> | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |  |     |       |  |  |  |  |  |  |  |  |
| 1        | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 |  | No. | 413   |  |  |  |  |  |  |  |  |
| 2        | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      |  | No. | 206   |  |  |  |  |  |  |  |  |
| 3        | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. |  | No. | 2,587 |  |  |  |  |  |  |  |  |
| 4        | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                |  | No. | 6,768 |  |  |  |  |  |  |  |  |
| 5        | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor (See Note-3)                                                                                  |  | No. | 1,692 |  |  |  |  |  |  |  |  |
| 6        | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         |  | No. | 832   |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total E :</b>                                                                                                                                                     |  |     |       |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                          |  |     |       |  |  |  |  |  |  |  |  |
| <b>F</b> | <b><u>Grounding Material</u></b>                                                                                                                                         |  |     |       |  |  |  |  |  |  |  |  |
| 1        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            |  | No. | 306   |  |  |  |  |  |  |  |  |
| 2        | Furnish flat to cable connector.                                                                                                                                         |  | No. | 306   |  |  |  |  |  |  |  |  |

|                      |                                                                                                                                                                                                                                                                                                                        |       |     |  |  |  |  |  |  |  |  |  |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|--|--|--|--|--|--|--|--|--|
| 3                    | Furnish cable to rod connector.                                                                                                                                                                                                                                                                                        | No.   | 306 |  |  |  |  |  |  |  |  |  |
| 4                    | Furnish 7 No. 10 copper covered ground wire.                                                                                                                                                                                                                                                                           | Meter | 918 |  |  |  |  |  |  |  |  |  |
| <b>Sub-Total F :</b> |                                                                                                                                                                                                                                                                                                                        |       |     |  |  |  |  |  |  |  |  |  |
| <b>G</b>             | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                                                                                                                                                                    |       |     |  |  |  |  |  |  |  |  |  |
| <b>1</b>             | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                                             |       |     |  |  |  |  |  |  |  |  |  |
|                      | Furnish 500kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |       |     |  |  |  |  |  |  |  |  |  |
|                      | (a) <u>Tower Type "DS1"</u>                                                                                                                                                                                                                                                                                            |       |     |  |  |  |  |  |  |  |  |  |
|                      | (i) Basic Tower Body                                                                                                                                                                                                                                                                                                   | No.   | 10  |  |  |  |  |  |  |  |  |  |
|                      | (ii) 2.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No.   | 8   |  |  |  |  |  |  |  |  |  |
|                      | (iii) 4.0 m Single Leg Extension                                                                                                                                                                                                                                                                                       | No.   | 16  |  |  |  |  |  |  |  |  |  |
|                      | (iv) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No.   | 16  |  |  |  |  |  |  |  |  |  |
|                      | (v) 8.0 m Single Leg Extension                                                                                                                                                                                                                                                                                         | No.   | 16  |  |  |  |  |  |  |  |  |  |
|                      | (vi) 6.0 m Body Extension                                                                                                                                                                                                                                                                                              | No.   | 1   |  |  |  |  |  |  |  |  |  |
|                      | (vii) Stubs                                                                                                                                                                                                                                                                                                            | No.   | 48  |  |  |  |  |  |  |  |  |  |
|                      | (b) <u>Tower Type "DA1"</u>                                                                                                                                                                                                                                                                                            |       |     |  |  |  |  |  |  |  |  |  |
|                      | (i) Basic Tower Body                                                                                                                                                                                                                                                                                                   | No.   | 4   |  |  |  |  |  |  |  |  |  |
|                      | (ii) 2.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No.   | 4   |  |  |  |  |  |  |  |  |  |
|                      | (iii) 4.0 m Single Leg Extension                                                                                                                                                                                                                                                                                       | No.   | 8   |  |  |  |  |  |  |  |  |  |
|                      | (iv) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No.   | 4   |  |  |  |  |  |  |  |  |  |
|                      | (v) 8.0 m Single Leg Extension                                                                                                                                                                                                                                                                                         | No.   | 8   |  |  |  |  |  |  |  |  |  |
|                      | (vi) 6.0 m Body Extension                                                                                                                                                                                                                                                                                              | No.   | 2   |  |  |  |  |  |  |  |  |  |
|                      | (vii) Stubs                                                                                                                                                                                                                                                                                                            | No.   | 16  |  |  |  |  |  |  |  |  |  |
|                      | (c) <u>Tower Type "DD1"</u>                                                                                                                                                                                                                                                                                            |       |     |  |  |  |  |  |  |  |  |  |
|                      | (i) Basic Tower Body                                                                                                                                                                                                                                                                                                   | No.   | 4   |  |  |  |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                   |                              |     |       |  |  |  |  |  |  |  |  |  |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----|-------|--|--|--|--|--|--|--|--|--|
|   | (ii)                                                                                                                                                                                                                                              | 2.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|   | (iii)                                                                                                                                                                                                                                             | 4.0 m Single Leg Extension   | No. | 8     |  |  |  |  |  |  |  |  |  |
|   | (iv)                                                                                                                                                                                                                                              | 6.0 m Single Leg Extension   | No. | 8     |  |  |  |  |  |  |  |  |  |
|   | (v)                                                                                                                                                                                                                                               | 8.0 m Single Leg Extension   | No. | 8     |  |  |  |  |  |  |  |  |  |
|   | (vi)                                                                                                                                                                                                                                              | 6.0 m Body Extension         | No. | 2     |  |  |  |  |  |  |  |  |  |
|   | (vii)                                                                                                                                                                                                                                             | Stubs                        | No. | 16    |  |  |  |  |  |  |  |  |  |
|   | (d)                                                                                                                                                                                                                                               | <u>Tower Type "TDT"</u>      |     |       |  |  |  |  |  |  |  |  |  |
|   | (i)                                                                                                                                                                                                                                               | Basic Tower Body             | No. | -     |  |  |  |  |  |  |  |  |  |
|   | (ii)                                                                                                                                                                                                                                              | 6.0 m Single Leg Extension   | No. | -     |  |  |  |  |  |  |  |  |  |
|   | (iii)                                                                                                                                                                                                                                             | Stubs                        | No. | -     |  |  |  |  |  |  |  |  |  |
|   | <b><u>Conductor and OPGW (With Associated Equipment)</u></b>                                                                                                                                                                                      |                              |     |       |  |  |  |  |  |  |  |  |  |
| 2 | Furnish 795 KCM ACSR "Drake" Conductor                                                                                                                                                                                                            |                              | km  | 118.4 |  |  |  |  |  |  |  |  |  |
| 3 | Furnish                                                                                                                                                                                                                                           |                              |     |       |  |  |  |  |  |  |  |  |  |
|   | (a)                                                                                                                                                                                                                                               | OPGW with at least 24 fibers | km  | 15    |  |  |  |  |  |  |  |  |  |
|   | (b)                                                                                                                                                                                                                                               | Joint boxes for OPGW         |     |       |  |  |  |  |  |  |  |  |  |
|   | (i)                                                                                                                                                                                                                                               | OPGW-OPGW (A Type)           | No. | 2     |  |  |  |  |  |  |  |  |  |
|   | (ii)                                                                                                                                                                                                                                              | OPGW-OPGW Cable ( B Type)    | No. | -     |  |  |  |  |  |  |  |  |  |
|   | (iii)                                                                                                                                                                                                                                             | OPGW-attaching Clamps        | No. | 120   |  |  |  |  |  |  |  |  |  |
|   | (iv)                                                                                                                                                                                                                                              | Fibre Optic Approach Cable   | km  | -     |  |  |  |  |  |  |  |  |  |
|   | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                      |                              |     |       |  |  |  |  |  |  |  |  |  |
| 4 | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001 |                              | Set | 60    |  |  |  |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                                                    |     |    |  |  |  |  |  |  |  |  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|--|--|--|--|--|--|--|--|
| 5  | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002           | Set | 48 |  |  |  |  |  |  |  |  |
| 6  | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005 | Set | 96 |  |  |  |  |  |  |  |  |
| 7  | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                 | Set | 6  |  |  |  |  |  |  |  |  |
| 8  | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                | Set | 6  |  |  |  |  |  |  |  |  |
|    | <b>Hardware for OPGW</b>                                                                                                                                                                                                                                           |     |    |  |  |  |  |  |  |  |  |
| 9  | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                                              | Set | 20 |  |  |  |  |  |  |  |  |
| 10 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                                                                                                                       | Set | 3  |  |  |  |  |  |  |  |  |
| 11 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per                                                                                                                                                                            | Set | 16 |  |  |  |  |  |  |  |  |

|    |                                                                                                                                                                          |       |     |  |  |  |  |  |  |  |  |   |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|--|--|--|--|--|--|--|--|---|
|    | specification drawing No.<br>4029/169/TD/401C/01E014                                                                                                                     |       |     |  |  |  |  |  |  |  |  |   |
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |       |     |  |  |  |  |  |  |  |  |   |
| 12 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 | No.   | 41  |  |  |  |  |  |  |  |  |   |
| 13 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      | No.   | 20  |  |  |  |  |  |  |  |  |   |
| 14 | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No.   | 475 |  |  |  |  |  |  |  |  |   |
| 15 | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No.   | 850 |  |  |  |  |  |  |  |  |   |
| 16 | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor                                                                                               | No.   | 212 |  |  |  |  |  |  |  |  |   |
| 17 | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No.   | 107 |  |  |  |  |  |  |  |  |   |
|    | <b><u>Grounding Material</u></b>                                                                                                                                         |       |     |  |  |  |  |  |  |  |  |   |
| 18 | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            | No.   | 36  |  |  |  |  |  |  |  |  |   |
| 19 | Furnish flat to cable connector.                                                                                                                                         | No.   | 36  |  |  |  |  |  |  |  |  |   |
| 20 | Furnish cable to rod connector.                                                                                                                                          | No.   | 36  |  |  |  |  |  |  |  |  |   |
| 21 | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             | Meter | 108 |  |  |  |  |  |  |  |  |   |
|    | <b>Sub-Total of G :</b>                                                                                                                                                  |       |     |  |  |  |  |  |  |  |  | - |
|    | Total of Item A                                                                                                                                                          |       |     |  |  |  |  |  |  |  |  | - |
|    | Total of Item B                                                                                                                                                          |       |     |  |  |  |  |  |  |  |  | - |
|    | Total of Item C                                                                                                                                                          |       |     |  |  |  |  |  |  |  |  | - |
|    | Total of Item D                                                                                                                                                          |       |     |  |  |  |  |  |  |  |  | - |
|    | Total of Item E                                                                                                                                                          |       |     |  |  |  |  |  |  |  |  | - |
|    | Total of Item F                                                                                                                                                          |       |     |  |  |  |  |  |  |  |  | - |
|    | Total of Item G                                                                                                                                                          |       |     |  |  |  |  |  |  |  |  | - |
|    |                                                                                                                                                                          |       |     |  |  |  |  |  |  |  |  | - |

| Grand Total of column No. 11 & 12 to be carried forward to Grand summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |  |  |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|
| <p>* The Bidder shall specify the type of insulator being offered.</p> <p><b>Notes:</b></p> <p>Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types DS1, DA1, DD1, and TDT, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly.</p> <p>The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.</p> <p>The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.</p> <p>The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.</p> <p>The bidder shall be responsible to furnish the tower material, OPGW, conductor, insulators, accessories, dampers &amp; hardware for conductor and OPGW, for completion of line in all respect. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.</p> <p>The contractor shall transport, unload and stack leftover/additional material from site to NGC designated Warehouse/Store at its own cost.</p> <p>Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.</p> <p>The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully before filling up the schedule of prices.</p> <p>Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.</p> <p>Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.</p> <p>In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.</p> <p style="text-align: right;"><b>Signature of Bidder</b></p> |  |  |  |  |  |  |  |





| Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines<br>for C-5 Power Evacuation Scheme<br>Lot-II: 500 kV D/C Ludewala–Faisalabad West —Section B (Approx. 49 km) |                                                                                                                                                                                                                                                                                                                         |                  |                            |      |          |                |           |                 |                             |                                   |                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------|------|----------|----------------|-----------|-----------------|-----------------------------|-----------------------------------|--------------------------------------|
| SCHEDULE NO.2- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM WITHIN PAKISTAN                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                         |                  |                            |      |          |                |           |                 |                             |                                   |                                      |
| Item No.                                                                                                                                                                                                                          | Description                                                                                                                                                                                                                                                                                                             |                  |                            | Unit | Quantity | Unit Price     |           | Total EXW Price | Total Inland Transportation | Total Price<br><br>Local Currency | Sales and other Taxes & Duties (PKR) |
|                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                         |                  |                            |      |          | Local Currency | EXW Price |                 |                             |                                   |                                      |
| 1                                                                                                                                                                                                                                 | 2                                                                                                                                                                                                                                                                                                                       |                  |                            | 3    | 4        | 5              | 6         | 7 = 4 x 6       | 8                           | 9 = 7+ 8                          | 10                                   |
| A                                                                                                                                                                                                                                 | Steel Towers                                                                                                                                                                                                                                                                                                            |                  |                            |      |          |                |           |                 |                             |                                   |                                      |
| 1                                                                                                                                                                                                                                 | Furnish 500 kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                  |                            |      |          |                |           |                 |                             |                                   |                                      |
|                                                                                                                                                                                                                                   | (a)                                                                                                                                                                                                                                                                                                                     | Tower Type "DS1" |                            |      |          |                |           |                 |                             |                                   |                                      |
|                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                         | (i)              | Basic Tower Body           | No.  | 103      |                |           |                 |                             |                                   |                                      |
|                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                         | (ii)             | 2.0 m Single Leg Extension | No.  | 20       |                |           |                 |                             |                                   |                                      |
|                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                         | (iii)            | 4.0 m Single Leg Extension | No.  | 108      |                |           |                 |                             |                                   |                                      |
|                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                         | (iv)             | 6.0 m Single Leg Extension | No.  | 144      |                |           |                 |                             |                                   |                                      |
|                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                         | (v)              | 8.0 m Single Leg Extension | No.  | 140      |                |           |                 |                             |                                   |                                      |
|                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                         | (vi)             | 6.0 m Body Extension       | No.  | 4        |                |           |                 |                             |                                   |                                      |
|                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                         | (vii)            | Stubs                      | No.  | 412      |                |           |                 |                             |                                   |                                      |
|                                                                                                                                                                                                                                   | (b)                                                                                                                                                                                                                                                                                                                     | Tower Type "DA1" |                            |      |          |                |           |                 |                             |                                   |                                      |

|          |                                                              |                              |     |       |  |  |  |  |  |  |
|----------|--------------------------------------------------------------|------------------------------|-----|-------|--|--|--|--|--|--|
|          | (i)                                                          | Basic Tower Body             | No. | 25    |  |  |  |  |  |  |
|          | (ii)                                                         | 2.0 m Single Leg Extension   | No. | -     |  |  |  |  |  |  |
|          | (iii)                                                        | 4.0 m Single Leg Extension   | No. | 32    |  |  |  |  |  |  |
|          | (iv)                                                         | 6.0 m Single Leg Extension   | No. | 12    |  |  |  |  |  |  |
|          | (v)                                                          | 8.0 m Single Leg Extension   | No. | 56    |  |  |  |  |  |  |
|          | (vi)                                                         | 6.0 m Body Extension         | No. | 14    |  |  |  |  |  |  |
|          | (vii)                                                        | Stubs                        | No. | 100   |  |  |  |  |  |  |
|          | (c)                                                          | <u>Tower Type "DD1"</u>      |     |       |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body             | No. | 23    |  |  |  |  |  |  |
|          | (ii)                                                         | 2.0 m Single Leg Extension   | No. | -     |  |  |  |  |  |  |
|          | (iii)                                                        | 4.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |
|          | (iv)                                                         | 6.0 m Single Leg Extension   | No. | 44    |  |  |  |  |  |  |
|          | (v)                                                          | 8.0 m Single Leg Extension   | No. | 44    |  |  |  |  |  |  |
|          | (vi)                                                         | 6.0 m Body Extension         | No. | 14    |  |  |  |  |  |  |
|          | (vii)                                                        | Stubs                        | No. | 92    |  |  |  |  |  |  |
|          | (d)                                                          | <u>Tower Type "TDT"</u>      |     |       |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body             | No. | 2     |  |  |  |  |  |  |
|          | (ii)                                                         | 8.0 m Single Leg Extension   | No. | 8     |  |  |  |  |  |  |
|          | (iii)                                                        | Stubs                        | No. | 8     |  |  |  |  |  |  |
|          | <b>Sub-Total A :</b>                                         |                              |     |       |  |  |  |  |  |  |
| <b>B</b> | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                              |     |       |  |  |  |  |  |  |
| 1        | Furnish 795 KCM ACSR "Drake" Conductor                       |                              | km  | 1,200 |  |  |  |  |  |  |
| 2        | Furnish                                                      |                              |     |       |  |  |  |  |  |  |
|          | (a)                                                          | OPGW with at least 24 fibers | km  | 115   |  |  |  |  |  |  |
|          | (b)                                                          | Joint boxes for OPGW         |     |       |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                                    |                                                                      |     |       |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----|-------|--|--|--|--|--|--|
|          | (i)                                                                                                                                                                                                                                                                | OPGW-OPGW (A Type)                                                   | No. | 23    |  |  |  |  |  |  |
|          | (ii)                                                                                                                                                                                                                                                               | OPGW-OPGW Cable ( B Type)                                            | No. | 3     |  |  |  |  |  |  |
|          | (iii)                                                                                                                                                                                                                                                              | OPGW-attaching Clamps                                                | No. | 1,560 |  |  |  |  |  |  |
|          | (iv)                                                                                                                                                                                                                                                               | Fibre Optic Approach Cable                                           | km  | 6     |  |  |  |  |  |  |
|          | (c)                                                                                                                                                                                                                                                                | Test Equipment, Installation and Maintenance Tools                   |     | -     |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                                  | Fiber Optic Talk Set (Set comprised two units)                       | Set | 1     |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                                  | Fiber Optic Tool Kit                                                 | Set | 1     |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                                  | OTDR with range $\geq 400\text{km}$<br>Yokogawa AQ7260 or equivalent | Set | 1     |  |  |  |  |  |  |
|          | <b>Sub Total B :</b>                                                                                                                                                                                                                                               |                                                                      |     |       |  |  |  |  |  |  |
| <b>C</b> | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                                       |                                                                      |     |       |  |  |  |  |  |  |
| 1        | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001                  |                                                                      | Set | 618   |  |  |  |  |  |  |
| 2        | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002           |                                                                      | Set | 288   |  |  |  |  |  |  |
| 3        | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005 |                                                                      | Set | 576   |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                                                                                                         |     |    |  |  |  |  |  |  |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|--|--|--|--|--|--|
| 4 | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower type 'TDT' including Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing<br>(Note: No. of Insulators in each arm/string = 29 Nos.) as per specification drawing No. 4029/169/401C/TD/01E005a | Set | 16 |  |  |  |  |  |  |
| 5 | Furnish Single string Transposition Assembly Upright type "TDTU(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E006<br>(Note: No. of Insulators in each arm/string = 36 Nos.)            | Set | 8  |  |  |  |  |  |  |
| 6 | Furnish Single string Transposition Assembly Inverted type "TDTI(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E007<br>(Note: No. of Insulators in each arm/string = 36 Nos.)           | Set | 8  |  |  |  |  |  |  |
| 7 | Furnish Quad string special dead end assemblies type "SDE(4)" for Pre-RTV Coated 160kN E&M strength insulators for tower type "TDT" as per specification drawing No. 4029/169/401C/TD/01E008<br>(Note: No. of Insulators in each arm/string = 29 Nos.)                                                                                  | Set | 8  |  |  |  |  |  |  |
| 8 | Furnish Pipe Jumper Assembly type "VJT(4)" for Pre-RTV Coated 80kN E&M strength insulators for tower type "TDT" including jumper spacers & special jumper spacers as per specification drawing No. 4029/169/401C/TD/01E009<br>(Note: No. of Insulators in each arm/string = 54 Nos.)                                                    | Set | 8  |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                     |         |     |  |  |  |  |  |  |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|--|--|--|--|--|--|
| 9        | Furnish Special Tension Clamp for tower type "TDT" as per specification                                                                                                                                                                             | Set     | 32  |  |  |  |  |  |  |
| 10       | Furnish Jumper Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                                 | Set     | 128 |  |  |  |  |  |  |
| 11       | Furnish Straight Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                               | Set     | 32  |  |  |  |  |  |  |
| 12       | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010  | Set     | 6   |  |  |  |  |  |  |
| 13       | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011 | Set     | 6   |  |  |  |  |  |  |
| 14       | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assembles (items C1 - 8 & C12-13) with Coulomb or ElecNET software.                                                                        | Lumpsum | 1   |  |  |  |  |  |  |
|          | <b>Sub-Total C :</b>                                                                                                                                                                                                                                |         |     |  |  |  |  |  |  |
| <b>D</b> | <b><u>Hardware for OPGW</u></b>                                                                                                                                                                                                                     |         |     |  |  |  |  |  |  |
| 1        | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                               | Set     | 206 |  |  |  |  |  |  |
| 2        | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                                                                                                        | Set     | 23  |  |  |  |  |  |  |
| 3        | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per                                                                                                                                                             | Set     | 100 |  |  |  |  |  |  |

|          |                                                                                                                                                                          |       |       |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|--|--|--|--|--|--|
|          | specification drawing No.<br>4029/169/TD/401C/01E014                                                                                                                     |       |       |  |  |  |  |  |  |
|          | <b>Sub-Total D :</b>                                                                                                                                                     |       |       |  |  |  |  |  |  |
| <b>E</b> | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |       |       |  |  |  |  |  |  |
| 1        | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 | No.   | 413   |  |  |  |  |  |  |
| 2        | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      | No.   | 206   |  |  |  |  |  |  |
| 3        | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No.   | 2,587 |  |  |  |  |  |  |
| 4        | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No.   | 6,768 |  |  |  |  |  |  |
| 5        | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor (See Note-3)                                                                                  | No.   | 1,692 |  |  |  |  |  |  |
| 6        | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No.   | 832   |  |  |  |  |  |  |
|          | <b>Sub-Total E :</b>                                                                                                                                                     |       |       |  |  |  |  |  |  |
|          |                                                                                                                                                                          |       |       |  |  |  |  |  |  |
| <b>F</b> | <b><u>Grounding Material</u></b>                                                                                                                                         |       |       |  |  |  |  |  |  |
| 1        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            | No.   | 306   |  |  |  |  |  |  |
| 2        | Furnish flat to cable connector.                                                                                                                                         | No.   | 306   |  |  |  |  |  |  |
| 3        | Furnish cable to rod connector.                                                                                                                                          | No.   | 306   |  |  |  |  |  |  |
| 4        | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             | Meter | 918   |  |  |  |  |  |  |
|          | <b>Sub-Total F :</b>                                                                                                                                                     |       |       |  |  |  |  |  |  |
| <b>G</b> | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                      |       |       |  |  |  |  |  |  |
| <b>1</b> | <b><u>Steel Towers</u></b>                                                                                                                                               |       |       |  |  |  |  |  |  |

|  |     |                                                                                                                                                                                                                                                                                                                        |     |    |  |  |  |  |  |  |
|--|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|--|--|--|--|--|--|
|  |     | Furnish 500kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |     |    |  |  |  |  |  |  |
|  | (a) | <u>Tower Type "DS1"</u>                                                                                                                                                                                                                                                                                                |     |    |  |  |  |  |  |  |
|  |     | (i) Basic Tower Body                                                                                                                                                                                                                                                                                                   | No. | 10 |  |  |  |  |  |  |
|  |     | (ii) 2.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No. | 8  |  |  |  |  |  |  |
|  |     | (iii) 4.0 m Single Leg Extension                                                                                                                                                                                                                                                                                       | No. | 16 |  |  |  |  |  |  |
|  |     | (iv) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No. | 16 |  |  |  |  |  |  |
|  |     | (v) 8.0 m Single Leg Extension                                                                                                                                                                                                                                                                                         | No. | 16 |  |  |  |  |  |  |
|  |     | (vi) 6.0 m Body Extension                                                                                                                                                                                                                                                                                              | No. | 1  |  |  |  |  |  |  |
|  |     | (vii) Stubs                                                                                                                                                                                                                                                                                                            | No. | 48 |  |  |  |  |  |  |
|  | (b) | <u>Tower Type "DA1"</u>                                                                                                                                                                                                                                                                                                |     |    |  |  |  |  |  |  |
|  |     | (i) Basic Tower Body                                                                                                                                                                                                                                                                                                   | No. | 4  |  |  |  |  |  |  |
|  |     | (ii) 2.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No. | 4  |  |  |  |  |  |  |
|  |     | (iii) 4.0 m Single Leg Extension                                                                                                                                                                                                                                                                                       | No. | 8  |  |  |  |  |  |  |
|  |     | (iv) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No. | 4  |  |  |  |  |  |  |
|  |     | (v) 8.0 m Single Leg Extension                                                                                                                                                                                                                                                                                         | No. | 8  |  |  |  |  |  |  |
|  |     | (vi) 6.0 m Body Extension                                                                                                                                                                                                                                                                                              | No. | 2  |  |  |  |  |  |  |
|  |     | (vii) Stubs                                                                                                                                                                                                                                                                                                            | No. | 16 |  |  |  |  |  |  |
|  | (c) | <u>Tower Type "DD1"</u>                                                                                                                                                                                                                                                                                                |     |    |  |  |  |  |  |  |
|  |     | (i) Basic Tower Body                                                                                                                                                                                                                                                                                                   | No. | 4  |  |  |  |  |  |  |
|  |     | (ii) 2.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No. | 4  |  |  |  |  |  |  |
|  |     | (iii) 4.0 m Single Leg Extension                                                                                                                                                                                                                                                                                       | No. | 8  |  |  |  |  |  |  |
|  |     | (iv) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No. | 8  |  |  |  |  |  |  |
|  |     | (v) 8.0 m Single Leg Extension                                                                                                                                                                                                                                                                                         | No. | 8  |  |  |  |  |  |  |
|  |     | (vi) 6.0 m Body Extension                                                                                                                                                                                                                                                                                              | No. | 2  |  |  |  |  |  |  |
|  |     | (vii) Stubs                                                                                                                                                                                                                                                                                                            | No. | 16 |  |  |  |  |  |  |

|   |     |                                                                                                                                                                                                                                                          |                            |     |        |  |  |  |  |  |
|---|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----|--------|--|--|--|--|--|
|   | (d) | <u>Tower Type "TDT"</u>                                                                                                                                                                                                                                  |                            |     |        |  |  |  |  |  |
|   |     | (i)                                                                                                                                                                                                                                                      | Basic Tower Body           | No. | -      |  |  |  |  |  |
|   |     | (ii)                                                                                                                                                                                                                                                     | 6.0 m Single Leg Extension | No. | -      |  |  |  |  |  |
|   |     | (iii)                                                                                                                                                                                                                                                    | Stubs                      | No. | -      |  |  |  |  |  |
|   |     | <b><u>Conductor and OPGW (With Associated Equipment)</u></b>                                                                                                                                                                                             |                            |     |        |  |  |  |  |  |
| 2 |     | Furnish 795 KCM ACSR "Drake" Conductor                                                                                                                                                                                                                   |                            | km  | 118.40 |  |  |  |  |  |
| 3 |     | Furnish                                                                                                                                                                                                                                                  |                            |     |        |  |  |  |  |  |
|   | (a) | OPGW with at least 24 fibers                                                                                                                                                                                                                             |                            | km  | 15     |  |  |  |  |  |
|   | (b) | Joint boxes for OPGW                                                                                                                                                                                                                                     |                            |     |        |  |  |  |  |  |
|   |     | (i)                                                                                                                                                                                                                                                      | OPGW-OPGW (A Type)         | No. | 2      |  |  |  |  |  |
|   |     | (ii)                                                                                                                                                                                                                                                     | OPGW-OPGW Cable ( B Type)  | No. | -      |  |  |  |  |  |
|   |     | (iii)                                                                                                                                                                                                                                                    | OPGW-attaching Clamps      | No. | 120    |  |  |  |  |  |
|   |     | (iv)                                                                                                                                                                                                                                                     | Fibre Optic Approach Cable | km  | -      |  |  |  |  |  |
|   |     | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                             |                            |     |        |  |  |  |  |  |
| 4 |     | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001        |                            | Set | 60     |  |  |  |  |  |
| 5 |     | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002 |                            | Set | 48     |  |  |  |  |  |



|    |                                                                                                                                                                                                                                                                    |     |    |  |  |  |  |  |  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|--|--|--|--|--|--|
| 6  | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005 | Set | 96 |  |  |  |  |  |  |
| 7  | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                 | Set | 6  |  |  |  |  |  |  |
| 8  | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                | Set | 6  |  |  |  |  |  |  |
|    | <b><u>Hardware for OPGW</u></b>                                                                                                                                                                                                                                    |     |    |  |  |  |  |  |  |
| 9  | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                                              | Set | 20 |  |  |  |  |  |  |
| 10 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                                                                                                                       | Set | 3  |  |  |  |  |  |  |
| 11 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                                                                                                          | Set | 16 |  |  |  |  |  |  |
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                                                                                                              |     |    |  |  |  |  |  |  |
| 12 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                                                                                                           | No. | 41 |  |  |  |  |  |  |
| 13 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                                                                                                                | No. | 20 |  |  |  |  |  |  |

|                                                           |                                                                                                                                                                          |       |     |  |  |  |  |  |   |
|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|--|--|--|--|--|---|
| 14                                                        | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No.   | 475 |  |  |  |  |  |   |
| 15                                                        | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No.   | 850 |  |  |  |  |  |   |
| 16                                                        | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor                                                                                               | No.   | 212 |  |  |  |  |  |   |
| 17                                                        | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No.   | 107 |  |  |  |  |  |   |
|                                                           | <b><u>Grounding Material</u></b>                                                                                                                                         |       |     |  |  |  |  |  |   |
| 18                                                        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            | No.   | 36  |  |  |  |  |  |   |
| 19                                                        | Furnish flat to cable connector.                                                                                                                                         | No.   | 36  |  |  |  |  |  |   |
| 20                                                        | Furnish cable to rod connector.                                                                                                                                          | No.   | 36  |  |  |  |  |  |   |
| 21                                                        | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             | Meter | 108 |  |  |  |  |  |   |
|                                                           | <b>Sub-Total of G :</b>                                                                                                                                                  |       |     |  |  |  |  |  | - |
|                                                           | Total of Item A                                                                                                                                                          |       |     |  |  |  |  |  | - |
|                                                           | Total of Item B                                                                                                                                                          |       |     |  |  |  |  |  | - |
|                                                           | Total of Item C                                                                                                                                                          |       |     |  |  |  |  |  | - |
|                                                           | Total of Item D                                                                                                                                                          |       |     |  |  |  |  |  | - |
|                                                           | Total of Item E                                                                                                                                                          |       |     |  |  |  |  |  | - |
|                                                           | Total of Item F                                                                                                                                                          |       |     |  |  |  |  |  | - |
|                                                           | Total of Item G                                                                                                                                                          |       |     |  |  |  |  |  | - |
| <b>Total of Column 9 to be forwarded to Grand Summary</b> |                                                                                                                                                                          |       |     |  |  |  |  |  | - |
|                                                           |                                                                                                                                                                          |       |     |  |  |  |  |  |   |

- \* The Bidder shall specify the type of insulator being offered.

**Notes:**

- 1 Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types DS1, DA1, DD1, and TDT, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly.
- 2 The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.
- 3 The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.
- 4 The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.
- 5 The bidder shall be responsible to furnish the tower material, OPGW, conductor, insulators, accessories, dampers & hardware for conductor and OPGW, for completion of line in all respect. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.
- 6 The contractor shall transport, unload and stack leftover/additional material from site to NGC designated Warehouse/Store at its own cost.
- 7 Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.
- 8 The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully before filling up the schedule of prices.
- 9 Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.
- 10 Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.
- 11 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.

**Signature of Bidder**

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-II: 500 kV D/C Ludewala-Faisalabad West – Section B (Approx. 49 km)  
Schedule No.3 - Design Services**

| Item                                                  | Description | Qty. | Unit Price <sup>1</sup><br>Local<br>Currency | Total Price | Total<br>Provincial<br>Sales Tax |
|-------------------------------------------------------|-------------|------|----------------------------------------------|-------------|----------------------------------|
| 1                                                     | 2           | 3    | 4                                            | 5 = 3 x 4   | 6                                |
| 1                                                     |             | Lot  |                                              |             |                                  |
| NOT APPLICABLE                                        |             |      |                                              |             |                                  |
| 2                                                     |             | Lot  |                                              |             |                                  |
| 3                                                     |             | Lot  |                                              |             |                                  |
| TOTAL Column 5 to be carried forward to Grand Summary |             |      |                                              |             |                                  |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>1</sup>Specify currency in accordance ITB 12.

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme  
Lot-II: 500 kV D/C Ludewala–Faisalabad West —Section B (Approx. 49 km)**

**SCHEDULE NO.4 - INSTALLATION AND OTHER SERVICES**

**(INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)**

| Item No.                                                                                  | Description                 | Unit     | Qty | Unit Price (PKR) | Total Price (PKR) Including all Custom duties, taxes and other levies etc. w/o Provincial Sales Tax | Total Provincial Sales tax (PST) in PKR |
|-------------------------------------------------------------------------------------------|-----------------------------|----------|-----|------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------|
| 1                                                                                         | 2                           | 3        | 4   | 5                | 6=4*5                                                                                               | 7                                       |
| <b>INSTALLATION (INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)</b> |                             |          |     |                  |                                                                                                     |                                         |
| A                                                                                         | <u>Survey</u>               |          |     |                  |                                                                                                     |                                         |
| 1                                                                                         | Clearing Right of Way (ROW) | Lump Sum | 1   |                  |                                                                                                     |                                         |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |     |  |  |  |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----|--|--|--|
| 2        | Validation of already established centre line prior to foundation construction and preparation of as-built plan & profile drawings of the already prepared plan & profile drawings using PLS-CADD and construction structure lists (to be provided to the Contractor after award of contract) of the constructed transmission line after incorporating all the changes and submitted to the Project Manager. In case of route diversion, payment of the diverted portion will be made as per item A.3 | km        | 49  |  |  |  |
| 3        | Route alignment and detailed surveying of diverted portion not limited to chainage and leveling, preparation of plan & profile drawings, spotting of towers and preparation of construction structure list & Latitude & Longitude with hand held GPS of each tower location                                                                                                                                                                                                                           | km        | 4.9 |  |  |  |
|          | <b>Sub-Total A:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |     |  |  |  |
| <b>B</b> | <b><u>Sub-soil Investigations:</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |     |  |  |  |
|          | Sub-Soil Investigation for T/Line at (ii) and confirmatory sub-soil Investigation in varied soil/boulder/rock (including laboratory tests) as per Specifications (Technical Provisions for Construction Clause 10.2) and submission of Sub-Soil Investigation Report.                                                                                                                                                                                                                                 |           |     |  |  |  |
| (a)      | From NSL to depth of 15 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Lin. Mtr. | 75  |  |  |  |
| (b)      | From 15 m to depth of 25 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Lin. Mtr. | 30  |  |  |  |
| (c)      | Hand Auger upto depth of 10m                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Lin. Mtr. | 70  |  |  |  |
|          | <b>Sub-Total B:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |     |  |  |  |
| <b>C</b> | <b><u>Foundations</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |     |  |  |  |

|  |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |    |  |  |  |
|--|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----|--|--|--|
|  |       | Reinforced Concrete Spread Foundations (4 legs) complete in all respect in varied soil as well as boulders/rock complete with supply of materials including alignment, peg marking, access, preparatory works, excavation, blasting, leveling, grading of tower site, cutting, dewatering, shuttering, reinforcement, concreting (using Sulphate Resistance Cement conforming to ASTM C-150 Type-V), lean concrete (if required), curing, backfilling of foundations after concreting with excavated/borrowed earth (irrespective of lead), application of three (03) coats hot bitumen (ExpanProof* 10 – Fospak bitumen and compaction of backfill material in layers, stub setting and site restoration etc. including tower staking (Latitude & Longitude with hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type as per drawings and specifications: |            |    |  |  |  |
|  | (a)   | DS1 (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G010                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |    |  |  |  |
|  | (i)   | Foundation Type D1 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 27 |  |  |  |
|  | (ii)  | Foundation Type D2 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 34 |  |  |  |
|  | (iii) | Foundation Type S (Semi-Submerged)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Foundation | 2  |  |  |  |
|  | (iv)  | Foundation Type W (Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Foundation | 0  |  |  |  |
|  | (b)   | DA1 (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |    |  |  |  |
|  | (i)   | Foundation Type D1 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 10 |  |  |  |
|  | (ii)  | Foundation Type D2 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 2  |  |  |  |
|  | (iii) | Foundation Type S (Semi-Submerged)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Foundation | 2  |  |  |  |
|  | (c)   | DD1 (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G012                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |    |  |  |  |
|  | (i)   | Foundation Type D1 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 8  |  |  |  |
|  | (ii)  | Foundation Type D2 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 1  |  |  |  |
|  | (iii) | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Foundation | 0  |  |  |  |
|  | (d)   | TDT (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G020                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |    |  |  |  |

|          |                                |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |           |  |  |  |
|----------|--------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|--|--|--|
|          |                                | (i)  | Foundation Type D1 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 1         |  |  |  |
|          |                                | (ii) | Foundation Type D2 (Dry) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Foundation | 1         |  |  |  |
|          | <b>Sub-Total C:</b>            |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |           |  |  |  |
| <b>D</b> | <b><u>Pile Foundations</u></b> |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |           |  |  |  |
|          | D-1                            |      | Reinforced concrete pile foundations (cast in situ installation) complete in all type of soil as well as boulders/gravels/rock with supply of materials including excavation, drilling/boring, shuttering, reinforcement, concreting, bitumen coating, backfilling, installation of Stubs, tower grounding, site clearing etc. using Sulphate Resistance Cement conforming to ASTM C-150 Type-V shall be used including tower staking (Latitude & Longitude with RTK/hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type: |            |           |  |  |  |
|          | (a)                            |      | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DS1, and drawing No. <b>4029/169/TLC-22/TD/01G014</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Foundation | <b>32</b> |  |  |  |
|          | (b)                            |      | Reinforced concrete single pile per footing 900 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G014</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |           |  |  |  |
|          |                                | (i)  | Pile shaft upto depth of 20 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Lin.mtr    | 2560      |  |  |  |
|          |                                | (ii) | Pile shaft depth 20 - 25 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lin.mtr    | 260       |  |  |  |
|          | (c)                            |      | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DA1, and drawing No. <b>4029/169/TLC-22/TD/01G015</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Foundation | <b>3</b>  |  |  |  |
|          | (d)                            |      | Reinforced concrete single pile per footing 1200 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G015</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |           |  |  |  |



|     |       |                                                                                                                                                           |            |          |  |  |  |
|-----|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|--|--|--|
|     | (i)   | Pile shaft upto depth of 20 m                                                                                                                             | Lin.mtr    | 240      |  |  |  |
|     | (ii)  | Pile shaft depth 20 - 25 m                                                                                                                                | Lin.mtr    | 60       |  |  |  |
|     | (iii) | Pile shaft depth 25 - 30 m                                                                                                                                | Lin.mtr    | 20       |  |  |  |
| (e) |       | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DD1/DT1, and drawing No. <b>4029/169/TLC-22/TD/01G016</b>            | Foundation | <b>5</b> |  |  |  |
| (f) |       | Reinforced concrete single pile per footing 1500 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G016</b> (including steel liner/casing), if required. |            |          |  |  |  |
|     | (i)   | Pile shaft upto depth of 20 m                                                                                                                             | Lin.mtr    | 400      |  |  |  |
|     | (ii)  | Pile shaft depth 20 - 25 m                                                                                                                                | Lin.mtr    | 100      |  |  |  |
|     | (iii) | Pile shaft depth 25 - 30 m                                                                                                                                | Lin.mtr    | 40       |  |  |  |
| (g) |       | Reinforced concrete pile caps with Tie Beam and stub setting as per tower type and drawing No. <b>3217/169/TD/01G109</b>                                  | Foundation | <b>5</b> |  |  |  |
| (h) |       | Reinforced concrete single pile per footing 1200 mm dia. as per drawing No. <b>3217/169/TD/01G109</b>                                                     |            |          |  |  |  |
|     | (i)   | Pile shaft upto depth of 20 m                                                                                                                             | Lin.mtr    | 400      |  |  |  |
|     | (ii)  | Pile shaft depth 20 - 25 m                                                                                                                                | Lin.mtr    | 100      |  |  |  |
|     | (iii) | Pile shaft depth 25 - 30 m                                                                                                                                | Lin.mtr    | 100      |  |  |  |
|     | (iii) | Pile shaft depth 30 - 35 m                                                                                                                                | Lin.mtr    | 20       |  |  |  |

|  |       |                                                                                                                                                               |            |          |  |  |  |
|--|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|--|--|--|
|  | (i)   | Reinforced concrete pile caps with Tie Beam and stub setting as per tower type and drawing No. <b>4029/169/TLC-22/TD/01G017</b>                               | Foundation | <b>2</b> |  |  |  |
|  | (j)   | Reinforced concrete single pile per footing 1500 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G017</b>                                                  |            |          |  |  |  |
|  | (i)   | Pile shaft upto depth of 20 m                                                                                                                                 | Lin.mtr    | 160      |  |  |  |
|  | (ii)  | Pile shaft depth 20 - 25 m                                                                                                                                    | Lin.mtr    | 40       |  |  |  |
|  | (iii) | Pile shaft depth 25 - 30 m                                                                                                                                    | Lin.mtr    | 40       |  |  |  |
|  | (k)   | Reinforced concrete pile caps with Tie Beam and stub setting as per tower type and drawing No. <b>3217/169/TD/01G111</b>                                      | Foundation | <b>1</b> |  |  |  |
|  | (l)   | Reinforced concrete Double pile per footing 1350 mm dia. as per drawing No. <b>3217/169/TD/01G111</b>                                                         |            |          |  |  |  |
|  | (i)   | Pile shaft upto depth of 20 m                                                                                                                                 | Lin.mtr    | 160      |  |  |  |
|  | (ii)  | Pile shaft depth 20 - 30 m                                                                                                                                    | Lin.mtr    | 80       |  |  |  |
|  | (iii) | Pile shaft depth 30 - 40 m                                                                                                                                    | Lin.mtr    | 80       |  |  |  |
|  | (m)   | Reinforced concrete pile caps with Tie Beam and stub setting as per tower type and drawing No. <b>3217/169/TD/01G112</b>                                      | Foundation | <b>5</b> |  |  |  |
|  | (n)   | Reinforced concrete Double pile per footing 1200 mm dia. as per drawing No. <b>3217/169/TD/01G112</b>                                                         |            |          |  |  |  |
|  | (i)   | Pile shaft upto depth of 20 m                                                                                                                                 | Lin.mtr    | 800      |  |  |  |
|  | (ii)  | Pile shaft depth 20 - 30 m                                                                                                                                    | Lin.mtr    | 400      |  |  |  |
|  | (iii) | Pile shaft depth 30 - 40 m                                                                                                                                    | Lin.mtr    | 400      |  |  |  |
|  | D-2   | Pile load test in compression confirming to ASTM D1143 / D1143M and in uplift confirming to ASTM D3689 / D3689M at 2.5 times of tower foundation loads        |            |          |  |  |  |
|  | (a)   | DS1 (In Compression)                                                                                                                                          | Pile       | 1        |  |  |  |
|  | (b)   | DS1 (In Tension/Uplift)                                                                                                                                       | Pile       | 1        |  |  |  |
|  | (c)   | DA1 (In Compression)                                                                                                                                          | Pile       | 1        |  |  |  |
|  | (d)   | DA1 (In Tension/Uplift)                                                                                                                                       | Pile       | 1        |  |  |  |
|  | (e)   | Reinforced concrete single Test pile per footing 900 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G014</b> (including steel liner/casing), if required. |            | 1        |  |  |  |

|          |                                                                                                                                                                                                                                                                                 |       |                                                                                                                                                                |                    |       |  |  |  |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|--|--|--|
|          |                                                                                                                                                                                                                                                                                 | (i)   | Pile shaft upto depth of 20 m                                                                                                                                  | Lin.mtr            | 80    |  |  |  |
|          |                                                                                                                                                                                                                                                                                 | (ii)  | Pile shaft depth 20 - 25 m                                                                                                                                     | Lin.mtr            | 20    |  |  |  |
|          |                                                                                                                                                                                                                                                                                 | (f)   | Reinforced concrete single Test pile per footing 1200 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G015</b> (including steel liner/casing), if required. |                    | 1     |  |  |  |
|          |                                                                                                                                                                                                                                                                                 | (i)   | Pile shaft upto depth of 20 m                                                                                                                                  | Lin.mtr            | 80    |  |  |  |
|          |                                                                                                                                                                                                                                                                                 | (ii)  | Pile shaft depth 20 - 30 m                                                                                                                                     | Lin.mtr            | 40    |  |  |  |
|          |                                                                                                                                                                                                                                                                                 | (iii) | Pile shaft depth 30 - 35 m                                                                                                                                     | Lin.mtr            | 20    |  |  |  |
|          | D-6                                                                                                                                                                                                                                                                             |       | Sonic Integrity Test at pile foundation confirming to ASTM D5882                                                                                               | No.                | 70    |  |  |  |
|          | <b>Sub-Total D:</b>                                                                                                                                                                                                                                                             |       |                                                                                                                                                                |                    |       |  |  |  |
| <b>E</b> | <b><u>Erection of Steel Towers</u></b>                                                                                                                                                                                                                                          |       |                                                                                                                                                                |                    |       |  |  |  |
| 1        | Transport and Install 500kV double circuit tower types 'DS1', 'DA1', 'DD1' & TDT with all accessories i.e anti climbing devices, aerial markers number plates, danger signs, phase plates, Bird Guards etc. in accordance with requirements of Bidding Documents                |       |                                                                                                                                                                | Ton                | 5,477 |  |  |  |
| 2        | Welding of erected tower bolts & nuts after final inspection upto height of 8.0 m from top of foundation chimney as per specification drawing                                                                                                                                   |       |                                                                                                                                                                | Each tower         | 153   |  |  |  |
|          | <b>Sub-Total E:</b>                                                                                                                                                                                                                                                             |       |                                                                                                                                                                |                    |       |  |  |  |
| <b>F</b> | <b><u>Stringing of Conductor and OPGW</u></b>                                                                                                                                                                                                                                   |       |                                                                                                                                                                |                    |       |  |  |  |
| 1        | Transport & Install 795KCM ACSR Drake for quad conductor configuration insulator hanging, hardware assemblies, accessories & dampers etc. complete in all respects as per specifications & approved drawings and methodology.                                                   |       |                                                                                                                                                                | km D/C Quad Bundle | 49    |  |  |  |
| 2        | Transport & Install OPGW including installation of drop down lengths for joint boxes at the towers along with allied hardware material including hardware assemblies, joint boxes accessories, dampers etc. complete in all respects as per specifications & approved drawings. |       |                                                                                                                                                                | km (on Both Peaks) | 49    |  |  |  |
|          | <b>Sub-Total F:</b>                                                                                                                                                                                                                                                             |       |                                                                                                                                                                |                    |       |  |  |  |

|          |                                                                                                                                      |         |      |  |   |   |
|----------|--------------------------------------------------------------------------------------------------------------------------------------|---------|------|--|---|---|
| <b>G</b> | <b><u>Testing &amp; Commissioning</u></b>                                                                                            |         |      |  |   |   |
| 1        | Testing and commissioning of the line                                                                                                | Lumpsum | 1    |  |   |   |
|          | <b>Sub-Total G:</b>                                                                                                                  |         |      |  |   |   |
| <b>H</b> | <b><u>ENVIRONMENTAL AND SOCIAL SAFEGUARDS</u></b>                                                                                    |         |      |  |   |   |
| 1        | Tree Plantation (Minimum height 4 feet)                                                                                              | No.     | 2000 |  |   |   |
| 2        | Water quality monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route. | No.     | 21   |  |   |   |
| 3        | Ambient Air monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route.   | No.     | 21   |  |   |   |
| 4        | Noise monitoring / analysis / measurement on quarterly basis for the whole project period at three locations along the TL route.     | No.     | 21   |  |   |   |
|          | <b>Sub-Total H:</b>                                                                                                                  |         |      |  | - | - |
| <b>I</b> | <b><u>INSTALLATION SERVICES FOR ADDITIONAL WORK</u></b>                                                                              |         |      |  |   |   |
| 1        | Grading/Cutting/Excavation (Dry Soil)                                                                                                | Cu. m.  | 80   |  |   |   |
| 2        | Excavation (semi-submerged soil)                                                                                                     | Cu. m.  | 40   |  |   |   |
| 3        | Excavation (submerged soil)                                                                                                          | Cu. m.  | 60   |  |   |   |
| 4        | Blasting/Cutting/Excavation/Grading (boulder/Rock)                                                                                   | Cu. m.  | 80   |  |   |   |
| 5        | Concrete (3000 psi at 28 days) furnished and installed                                                                               | Cu. m.  | 150  |  |   |   |
| 6        | Concrete (4000 psi at 28 days) furnished and installed                                                                               | Cu. m.  | 150  |  |   |   |
| 7        | Reinforcing Bars furnished and installed (Grade-60)                                                                                  | kg      | 1500 |  |   |   |
| 8        | Overhaul from Borrow and Compaction (regardless of the distance for borrow)                                                          | Cu. m.  | 150  |  |   |   |
| 9        | Lean concrete furnished and installed (2000 psi strength at 28 days)                                                                 | Cu. m.  | 120  |  |   |   |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                 |           |     |  |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-----------|-----|--|--|--|
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Compacted crush+sand (50:50 ratio) installed under footings     | Cu. m.    | 50  |  |  |  |
| 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Bitumen coating for footing                                     | Sq. m     | 100 |  |  |  |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Compacted Backfill                                              | Cu. m.    | 150 |  |  |  |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Steel Casing/Liner (steel sheet thickness- 8mm) Diameter 1250mm | Lin. Mtrs | 120 |  |  |  |
| 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Steel Casing/Liner (steel sheet thickness- 8mm) Diameter 1400mm | Lin. Mtrs | 50  |  |  |  |
| 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Steel Casing/Liner (steel sheet thickness- 8mm) Diameter 1550mm | Lin. Mtrs | 60  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Sub-Total I:</b>                                             |           |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item A</b>                                          |           |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item B</b>                                          |           |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item C</b>                                          |           |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item D</b>                                          |           |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item E</b>                                          |           |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item F</b>                                          |           |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item G</b>                                          |           |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item H</b>                                          |           |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item I</b>                                          |           |     |  |  |  |
| <b>Total (Column 6) to be carried forward to Grand Summary</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                 |           |     |  |  |  |
| <p><b><u>Notes:</u></b></p> <ol style="list-style-type: none"> <li>1 The quantities mentioned in the BOQ are estimated quantities. These quantities are to be used for bid evaluation purpose only. The actual quantities may vary depending upon detailed engineering and approved drawings. However, the unit rates for material and service quoted in the BOQ/ bid shall remain firm and final if design is unchanged.</li> <li>2 Price of any other item specifically not covered in the Price Schedules but is required for the completion, commissioning and operation of the transmission line shall be deemed to be included in the Price Schedules.</li> <li>3 In case of failure by the bidder to fill the price of Sales Tax in relevant column, the quoted price of the bidder will be considered inclusive of Sales Tax applicable as per Lax and relevant provisions of the Bidding Documents. In case the bidder takes deviation or mention that prices are exclusive of PST, his bid shall be considered as non-responsive.</li> <li>4 Foundation means four legs of tower.</li> </ol> |                                                                 |           |     |  |  |  |

- 5 An allowance of two percent (2%) of the total installed quantity will be permitted for sag, jumpers and wastage for the conductor, one percent (1%) for OPGW and two percent (2%) for lossage of nuts, bolts and washers (for towers only); and one percent (1%) for insulator breakage. These allowances are the maximum permissible and in case of wastage less than these limits all excess material shall be returned to NGC storage yards by the Contractor. For quantities in excess of these limits, the Contractor shall replace or reimburse NGC for the loss. All unused, above allowable limits of waste materials and packing wood are the property of NGC and shall be returned to NGC storage yards by the Contractor.
- 6 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.
- 7 The Bidder shall quote prices against all items, including those for which the specified quantity is "0". No item shall be left blank or unpriced in the Price Schedule.
- 8 Pile Foundation design will be release after the submission of Pile load test Report.
- 9 Location for Sonic Integrity and sonic integrity test report approval will be accorded by the office of DG (C&SE) NGC.

**Name of  
Bidder  
Signature of  
Bidder**

| <b>Design, Manufacture, Procurement, Supply, Laying, Installation, Testing &amp; Commissioning<br/>of 500 kV Transmission Lines for C-5 Power Evacuation Scheme<br/>Lot-II: 500 kV D/C Ludewala–Faisalabad West —Section B (Approx. 49 km)</b> |                                                                                                  |                                           |                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------|
| <b><u>SCHEDULE NO. 5 - GRAND SUMMARY</u></b>                                                                                                                                                                                                   |                                                                                                  |                                           |                                           |
| <b>Sr.<br/>No.</b>                                                                                                                                                                                                                             | <b>Description</b>                                                                               | <b>Bid Prices</b>                         |                                           |
|                                                                                                                                                                                                                                                |                                                                                                  | <b>Foreign<br/>Currency<br/>Component</b> | <b>Local Currency<br/>Component (PKR)</b> |
| 1                                                                                                                                                                                                                                              | Total Schedule No. 1 Plant and Mandatory Spare Parts Supplied from Abroad                        |                                           |                                           |
| 2                                                                                                                                                                                                                                              | Total Schedule No. 2 Plant and Mandatory Spare Parts Supplied from Within the Employer's Country |                                           |                                           |
| 3                                                                                                                                                                                                                                              | Total Schedule No. 3 Design Services                                                             |                                           |                                           |
| 4                                                                                                                                                                                                                                              | Total Schedule No. 4 Installation and Other Services                                             |                                           |                                           |
| 5                                                                                                                                                                                                                                              | Provisional Sum                                                                                  |                                           | 2,900 Million                             |
| <b>GRAND TOTAL to be carried forward to Letter of Price Bid</b>                                                                                                                                                                                |                                                                                                  |                                           |                                           |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

- 1 Specify the currency in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-II: 500 kV D/C Ludewala-Faisalabad West – Section B (Approx. 49 km)**

**Schedule No. 6 - Recommended Spare Parts**

| Item | Description    | Qty | Unit Price                              |                                                 | Total Price                  |                                |
|------|----------------|-----|-----------------------------------------|-------------------------------------------------|------------------------------|--------------------------------|
|      |                |     | EXW<br>Local Parts<br>Local<br>Currency | CIP<br>Imported<br>Parts<br>Foreign<br>Currency | Local<br>Currency<br>Portion | Foreign<br>Currency<br>Portion |
| 1    | 2              | 3   | 4                                       | 5                                               | 6 = 3 x 4                    | 7 = 3 x 5                      |
|      | NOT APPLICABLE |     |                                         |                                                 |                              |                                |
|      |                |     |                                         |                                                 |                              |                                |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_



## **Schedules of Rates and Prices**

### **(LOT-III)**

| Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme |                                                                                                                                                                                                                                                                                                                         |                                  |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|------------------------|------|----------|-----------------------------------|-----------|------------------------------------|-----------|-----------------------------|--------------------------------|----------|----------------|
| Lot-III: 500 kV D/C C5-Ludewala —Section A (Approx. 30 km)                                                                                           |                                                                                                                                                                                                                                                                                                                         |                                  |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| SCHEDULE NO.1- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM ABROAD                                                                                  |                                                                                                                                                                                                                                                                                                                         |                                  |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| Item No.                                                                                                                                             | Description                                                                                                                                                                                                                                                                                                             |                                  | Code Country of Origin | Unit | Quantity | Unit Price (CIF Pakistan Seaport) |           | Total Price (CIF Pakistan Seaport) |           | Total Inland Transportation | Total Price CIP (Project Site) |          | Taxes & Duties |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                         |                                  |                        |      |          | CFR                               | Insurance | CFR                                | Insurance |                             | FCC                            | LCC      | Local Currency |
| 1                                                                                                                                                    | 2                                                                                                                                                                                                                                                                                                                       |                                  | 3                      | 4    | 5        | 6                                 | 7         | 8=5 x 6                            | 9 = 5 x 7 | 10                          | 11=8                           | 12= 9+10 | 13             |
|                                                                                                                                                      | 500kV Double Circuit Transmission Line                                                                                                                                                                                                                                                                                  |                                  |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| A                                                                                                                                                    | Steel Towers                                                                                                                                                                                                                                                                                                            |                                  |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| 1                                                                                                                                                    | Furnish 500 kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                                  |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      | (a)                                                                                                                                                                                                                                                                                                                     | Tower Type "DS1"                 |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                         | (i) Basic Tower Body             |                        | No.  | 68       |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                         | (ii) 2.0 m Single Leg Extension  |                        | No.  | -        |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                         | (iii) 4.0 m Single Leg Extension |                        | No.  | 24       |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                         | (iv) 6.0 m Single Leg Extension  |                        | No.  | 112      |                                   |           |                                    |           |                             |                                |          |                |

|     |                         |                            |     |     |  |  |  |  |  |  |  |  |  |
|-----|-------------------------|----------------------------|-----|-----|--|--|--|--|--|--|--|--|--|
|     | (v)                     | 8.0 m Single Leg Extension | No. | 136 |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 6.0 m Body Extension       | No. | 2   |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 272 |  |  |  |  |  |  |  |  |  |
| (b) | <u>Tower Type "DA1"</u> |                            |     |     |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 10  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 2.0 m Single Leg Extension | No. | -   |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 4.0 m Single Leg Extension | No. | -   |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 6.0 m Single Leg Extension | No. | 24  |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 8.0 m Single Leg Extension | No. | 16  |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 6.0 m Body Extension       | No. | 2   |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 40  |  |  |  |  |  |  |  |  |  |
| (c) | <u>Tower Type "DD1"</u> |                            |     |     |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 14  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 2.0 m Single Leg Extension | No. | 8   |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 4.0 m Single Leg Extension | No. | 4   |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 6.0 m Single Leg Extension | No. | 28  |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 8.0 m Single Leg Extension | No. | 16  |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 6.0 m Body Extension       | No. | 3   |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 56  |  |  |  |  |  |  |  |  |  |
| (d) | <u>Tower Type "TDT"</u> |                            |     |     |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | -   |  |  |  |  |  |  |  |  |  |

|          |                                                                                                                               |                                                    |                                                                      |  |     |       |  |  |  |  |  |  |  |
|----------|-------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------------|--|-----|-------|--|--|--|--|--|--|--|
|          |                                                                                                                               | (ii)                                               | 8.0 m Single Leg Extension                                           |  | No. | -     |  |  |  |  |  |  |  |
|          |                                                                                                                               | (iii)                                              | Stubs                                                                |  | No. | -     |  |  |  |  |  |  |  |
|          | <b>Sub-Total A :</b>                                                                                                          |                                                    |                                                                      |  |     |       |  |  |  |  |  |  |  |
| <b>B</b> | <b><u>Conductor and OPGW (With Associated Equipment)</u></b>                                                                  |                                                    |                                                                      |  |     |       |  |  |  |  |  |  |  |
| 1        | Furnish 795 KCM ACSR "Drake" Conductor                                                                                        |                                                    |                                                                      |  | km  | 736   |  |  |  |  |  |  |  |
| 2        | Furnish                                                                                                                       |                                                    |                                                                      |  |     |       |  |  |  |  |  |  |  |
|          | (a)                                                                                                                           | OPGW with at least 24 fibers                       |                                                                      |  | km  | 70    |  |  |  |  |  |  |  |
|          | (b)                                                                                                                           | Joint boxes for OPGW                               |                                                                      |  |     |       |  |  |  |  |  |  |  |
|          |                                                                                                                               | (i)                                                | OPGW-OPGW (A Type)                                                   |  | No. | 14    |  |  |  |  |  |  |  |
|          |                                                                                                                               | (ii)                                               | OPGW-OPGW Cable ( B Type)                                            |  | No. | 3     |  |  |  |  |  |  |  |
|          |                                                                                                                               | (iii)                                              | OPGW-attaching Clamps                                                |  | No. | 1,020 |  |  |  |  |  |  |  |
|          |                                                                                                                               | (iv)                                               | Fibre Optic Approach Cable                                           |  | km  | 6     |  |  |  |  |  |  |  |
|          | (c)                                                                                                                           | Test Equipment, Installation and Maintenance Tools |                                                                      |  |     | -     |  |  |  |  |  |  |  |
|          |                                                                                                                               | -                                                  | Fiber Optic Talk Set (Set comprised two units)                       |  | Set | 1     |  |  |  |  |  |  |  |
|          |                                                                                                                               | -                                                  | Fiber Optic Tool Kit                                                 |  | Set | 1     |  |  |  |  |  |  |  |
|          |                                                                                                                               | -                                                  | OTDR with range $\geq 400\text{km}$<br>Yokogawa AQ7260 or equivalent |  | Set | 1     |  |  |  |  |  |  |  |
|          | <b>Sub Total B :</b>                                                                                                          |                                                    |                                                                      |  |     |       |  |  |  |  |  |  |  |
| <b>C</b> | <b><u>Insulator Hardware Assemblies</u></b><br><b><u>(Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b> |                                                    |                                                                      |  |     |       |  |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                                                                                                      |  |     |     |  |  |  |  |  |  |  |  |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|-----|--|--|--|--|--|--|--|--|
| 1 | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001                                                                                    |  | Set | 408 |  |  |  |  |  |  |  |  |
| 2 | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002                                                                             |  | Set | 144 |  |  |  |  |  |  |  |  |
| 3 | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005                                                                   |  | Set | 288 |  |  |  |  |  |  |  |  |
| 4 | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower type 'TDT' including Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing (Note: No. of Insulators in each arm/string = 29 Nos.) as per specification drawing No. 4029/169/401C/TD/01E005a |  | Set | -   |  |  |  |  |  |  |  |  |
| 5 | Furnish Single string Transposition Assembly Upright type "TDTU(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E006 (Note: No. of Insulators in each arm/string = 36 Nos.)            |  | Set | -   |  |  |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                                                                                                               |  |     |   |  |  |  |  |  |  |  |  |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|---|--|--|--|--|--|--|--|--|
| 6  | Furnish Single string Transposition Assembly Inverted type "TDTI(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E007<br>(Note: No. of Insulators in each arm/string = 36 Nos.) |  | Set | - |  |  |  |  |  |  |  |  |
| 7  | Furnish Quad string special dead end assemblies type "SDE(4)" for Pre-RTV Coated 160kN E&M strength insulators for tower type "TDT" as per specification drawing No. 4029/169/401C/TD/01E008<br>(Note: No. of Insulators in each arm/string = 29 Nos.)                                                                        |  | Set | - |  |  |  |  |  |  |  |  |
| 8  | Furnish Pipe Jumper Assembly type "VJT(4)" for Pre-RTV Coated 80kN E&M strength insulators for tower type "TDT" including jumper spacers & special jumper spacers as per specification drawing No. 4029/169/401C/TD/01E009<br>(Note: No. of Insulators in each arm/string = 54 Nos.)                                          |  | Set | - |  |  |  |  |  |  |  |  |
| 9  | Furnish Special Tension Clamp for tower type "TDT" as per specification                                                                                                                                                                                                                                                       |  | Set | - |  |  |  |  |  |  |  |  |
| 10 | Furnish Jumper Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                                                                                                           |  | Set | - |  |  |  |  |  |  |  |  |
| 11 | Furnish Straight Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                                                                                                         |  | Set | - |  |  |  |  |  |  |  |  |
| 12 | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower                                                                                                                                                         |  | Set | 6 |  |  |  |  |  |  |  |  |

|                      |                                                                                                                                                                                                                                                     |  |         |     |  |  |  |  |  |  |  |  |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------|-----|--|--|--|--|--|--|--|--|
|                      | side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                                                                                                                                                                        |  |         |     |  |  |  |  |  |  |  |  |
| 13                   | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011 |  | Set     | 6   |  |  |  |  |  |  |  |  |
| 14                   | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assemblies (items C1 - 8 & C12-13) with Coulomb or ElecNET software.                                                                       |  | Lumpsum | 1   |  |  |  |  |  |  |  |  |
| <b>Sub-Total C :</b> |                                                                                                                                                                                                                                                     |  |         |     |  |  |  |  |  |  |  |  |
| <b>D</b>             | <b><u>Hardware for OPGW</u></b>                                                                                                                                                                                                                     |  |         |     |  |  |  |  |  |  |  |  |
| 1                    | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                               |  | Set     | 136 |  |  |  |  |  |  |  |  |
| 2                    | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                                                                                                        |  | Set     | 14  |  |  |  |  |  |  |  |  |
| 3                    | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                                                                                           |  | Set     | 48  |  |  |  |  |  |  |  |  |
| <b>Sub-Total D :</b> |                                                                                                                                                                                                                                                     |  |         |     |  |  |  |  |  |  |  |  |
| <b>E</b>             | <b><u>Accessories and Dampers</u></b>                                                                                                                                                                                                               |  |         |     |  |  |  |  |  |  |  |  |
| 1                    | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                                                                                            |  | No.     | 253 |  |  |  |  |  |  |  |  |
| 2                    | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                                                                                                 |  | No.     | 127 |  |  |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                                                                                        |       |       |  |  |  |  |  |  |  |  |  |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|--|--|--|--|--|--|--|--|--|
| 3        | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor.                                                                                                                                               | No.   | 1,320 |  |  |  |  |  |  |  |  |  |
| 4        | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                                                                                                                                                              | No.   | 3,917 |  |  |  |  |  |  |  |  |  |
| 5        | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor (See Note-3)                                                                                                                                                                                                                                | No.   | 979   |  |  |  |  |  |  |  |  |  |
| 6        | Furnish stock bridge vibration dampers for OPGW.                                                                                                                                                                                                                                                                       | No.   | 474   |  |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total E :</b>                                                                                                                                                                                                                                                                                                   |       |       |  |  |  |  |  |  |  |  |  |
| <b>F</b> | <b><u>Grounding Material</u></b>                                                                                                                                                                                                                                                                                       |       |       |  |  |  |  |  |  |  |  |  |
| 1        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                                                                                                                                                                          | No.   | 184   |  |  |  |  |  |  |  |  |  |
| 2        | Furnish flat to cable connector.                                                                                                                                                                                                                                                                                       | No.   | 184   |  |  |  |  |  |  |  |  |  |
| 3        | Furnish cable to rod connector.                                                                                                                                                                                                                                                                                        | No.   | 184   |  |  |  |  |  |  |  |  |  |
| 4        | Furnish 7 No. 10 copper covered ground wire.                                                                                                                                                                                                                                                                           | Meter | 552   |  |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total F :</b>                                                                                                                                                                                                                                                                                                   |       |       |  |  |  |  |  |  |  |  |  |
| <b>G</b> | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                                                                                                                                                                    |       |       |  |  |  |  |  |  |  |  |  |
| <b>1</b> | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                                             |       |       |  |  |  |  |  |  |  |  |  |
|          | Furnish 500kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |       |       |  |  |  |  |  |  |  |  |  |
|          | (a) <u>Tower Type "DS1"</u>                                                                                                                                                                                                                                                                                            |       |       |  |  |  |  |  |  |  |  |  |



|     |                         |                            |     |    |  |  |  |  |  |  |  |  |  |
|-----|-------------------------|----------------------------|-----|----|--|--|--|--|--|--|--|--|--|
|     | (i)                     | Basic Tower Body           | No. | 7  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 2.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 4.0 m Single Leg Extension | No. | 8  |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 6.0 m Single Leg Extension | No. | 12 |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 8.0 m Single Leg Extension | No. | 12 |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 6.0 m Body Extension       | No. | 1  |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 32 |  |  |  |  |  |  |  |  |  |
| (b) | <u>Tower Type "DA1"</u> |                            |     |    |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 3  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 2.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 4.0 m Single Leg Extension | No. | -  |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 6.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 8.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 6.0 m Body Extension       | No. | 1  |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 12 |  |  |  |  |  |  |  |  |  |
| (c) | <u>Tower Type "DD1"</u> |                            |     |    |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 3  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 2.0 m Single Leg Extension | No. | 8  |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 4.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 6.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                   |                              |     |       |  |  |  |  |  |  |  |  |  |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----|-------|--|--|--|--|--|--|--|--|--|
|   | (v)                                                                                                                                                                                                                                               | 8.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|   | (vi)                                                                                                                                                                                                                                              | 6.0 m Body Extension         | No. | 1     |  |  |  |  |  |  |  |  |  |
|   | (vii)                                                                                                                                                                                                                                             | Stubs                        | No. | 12    |  |  |  |  |  |  |  |  |  |
|   | (d)                                                                                                                                                                                                                                               | <u>Tower Type "TDT"</u>      |     |       |  |  |  |  |  |  |  |  |  |
|   | (i)                                                                                                                                                                                                                                               | Basic Tower Body             | No. | -     |  |  |  |  |  |  |  |  |  |
|   | (ii)                                                                                                                                                                                                                                              | 6.0 m Single Leg Extension   | No. | -     |  |  |  |  |  |  |  |  |  |
|   | (iii)                                                                                                                                                                                                                                             | Stubs                        | No. | -     |  |  |  |  |  |  |  |  |  |
|   | <b><u>Conductor and OPGW (With Associated Equipment)</u></b>                                                                                                                                                                                      |                              |     |       |  |  |  |  |  |  |  |  |  |
| 2 | Furnish 795 KCM ACSR "Drake" Conductor                                                                                                                                                                                                            |                              | km  | 73.60 |  |  |  |  |  |  |  |  |  |
| 3 | Furnish                                                                                                                                                                                                                                           |                              |     |       |  |  |  |  |  |  |  |  |  |
|   | (a)                                                                                                                                                                                                                                               | OPGW with at least 24 fibers | km  | 10    |  |  |  |  |  |  |  |  |  |
|   | (b)                                                                                                                                                                                                                                               | Joint boxes for OPGW         |     |       |  |  |  |  |  |  |  |  |  |
|   | (i)                                                                                                                                                                                                                                               | OPGW-OPGW (A Type)           | No. | 1     |  |  |  |  |  |  |  |  |  |
|   | (ii)                                                                                                                                                                                                                                              | OPGW-OPGW Cable ( B Type)    | No. | -     |  |  |  |  |  |  |  |  |  |
|   | (iii)                                                                                                                                                                                                                                             | OPGW-attaching Clamps        | No. | 60    |  |  |  |  |  |  |  |  |  |
|   | (iv)                                                                                                                                                                                                                                              | Fibre Optic Approach Cable   | km  | -     |  |  |  |  |  |  |  |  |  |
|   | <b><u>Insulator Hardware Assemblies<br/>(Complete Hardware Strings for Quad<br/>Bundle ACSR Drake Conductor)</u></b>                                                                                                                              |                              |     |       |  |  |  |  |  |  |  |  |  |
| 4 | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001 |                              | Set | 42    |  |  |  |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                                                    |  |     |    |  |  |  |  |  |  |  |  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|----|--|--|--|--|--|--|--|--|
| 5  | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002           |  | Set | 36 |  |  |  |  |  |  |  |  |
| 6  | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005 |  | Set | 72 |  |  |  |  |  |  |  |  |
| 7  | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                 |  | Set | 6  |  |  |  |  |  |  |  |  |
| 8  | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                |  | Set | 6  |  |  |  |  |  |  |  |  |
|    | <b>Hardware for OPGW</b>                                                                                                                                                                                                                                           |  |     |    |  |  |  |  |  |  |  |  |
| 9  | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                                              |  | Set | 14 |  |  |  |  |  |  |  |  |
| 10 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                                                                                                                       |  | Set | 2  |  |  |  |  |  |  |  |  |
| 11 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per                                                                                                                                                                            |  | Set | 12 |  |  |  |  |  |  |  |  |

|    |                                                                                                                                                                          |       |     |  |  |  |  |  |  |  |  |   |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|--|--|--|--|--|--|--|--|---|
|    | specification drawing No.<br>4029/169/TD/401C/01E014                                                                                                                     |       |     |  |  |  |  |  |  |  |  |   |
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |       |     |  |  |  |  |  |  |  |  |   |
| 12 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 | No.   | 25  |  |  |  |  |  |  |  |  |   |
| 13 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      | No.   | 13  |  |  |  |  |  |  |  |  |   |
| 14 | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No.   | 370 |  |  |  |  |  |  |  |  |   |
| 15 | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No.   | 619 |  |  |  |  |  |  |  |  |   |
| 16 | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor                                                                                               | No.   | 155 |  |  |  |  |  |  |  |  |   |
| 17 | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No.   | 78  |  |  |  |  |  |  |  |  |   |
|    | <b><u>Grounding Material</u></b>                                                                                                                                         |       |     |  |  |  |  |  |  |  |  |   |
| 18 | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            | No.   | 26  |  |  |  |  |  |  |  |  |   |
| 19 | Furnish flat to cable connector.                                                                                                                                         | No.   | 26  |  |  |  |  |  |  |  |  |   |
| 20 | Furnish cable to rod connector.                                                                                                                                          | No.   | 26  |  |  |  |  |  |  |  |  |   |
| 21 | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             | Meter | 78  |  |  |  |  |  |  |  |  |   |
|    | <b>Sub-Total of G :</b>                                                                                                                                                  |       |     |  |  |  |  |  |  |  |  | - |
|    | Total of Item A                                                                                                                                                          |       |     |  |  |  |  |  |  |  |  | - |
|    | Total of Item B                                                                                                                                                          |       |     |  |  |  |  |  |  |  |  | - |
|    | Total of Item C                                                                                                                                                          |       |     |  |  |  |  |  |  |  |  | - |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                 |  |  |  |  |  |  |  |   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--|--|--|--|--|--|--|---|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Total of Item D |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Total of Item E |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Total of Item F |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Total of Item G |  |  |  |  |  |  |  | - |
| <b>Grand Total of column No. 11 &amp; 12 to be carried forward to Grand summary</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                 |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                 |  |  |  |  |  |  |  |   |
| <p>* The Bidder shall specify the type of insulator being offered.</p> <p><b>Notes:</b></p> <p>1 Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types DS1, DA1, DD1, and TDT, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly.</p> <p>2 The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.</p> <p>3 The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.</p> <p>4 The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.</p> <p>5 The bidder shall be responsible to furnish the tower material, OPGW, conductor, insulators, accessories, dampers &amp; hardware for conductor and OPGW, for completion of line in all respect. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.</p> <p>6 The contractor shall transport, unload and stack leftover/additional material from site to NGC designated Warehouse/Store at its own cost.</p> <p>7 Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.</p> <p>8 The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully before filling up the schedule of prices.</p> <p>9 Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.</p> |                 |  |  |  |  |  |  |  |   |

- |    |                                                                                                                               |
|----|-------------------------------------------------------------------------------------------------------------------------------|
| 10 | Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.     |
| 11 | In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly. |

**Signature  
of Bidder**

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5  
Power Evacuation Scheme  
Lot-III: 500 kV D/C C5-Ludewala —Section A (Approx. 30 km)**

**SCHEDULE NO.2- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM WITHIN PAKISTAN**

| Item No. | Description                                                                                                                                                                                                                                                                                                             |                            | Unit | Quantity | Unit Price     |           | Total EXW Price | Total Inland Transportation | Total Price<br>Local Currency | Sales and other Taxes & Duties (PKR) |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------|----------|----------------|-----------|-----------------|-----------------------------|-------------------------------|--------------------------------------|
|          |                                                                                                                                                                                                                                                                                                                         |                            |      |          | Local Currency | EXW Price |                 |                             |                               |                                      |
| 1        | 2                                                                                                                                                                                                                                                                                                                       |                            | 3    | 4        | 5              | 6         | 7 = 4 x 6       | 8                           | 9 = 7+ 8                      | 10                                   |
|          | <b><u>500kV Double Circuit Transmission Line</u></b>                                                                                                                                                                                                                                                                    |                            |      |          |                |           |                 |                             |                               |                                      |
| <b>A</b> | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                                              |                            |      |          |                |           |                 |                             |                               |                                      |
| 1        | Furnish 500 kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                            |      |          |                |           |                 |                             |                               |                                      |
|          | (a)                                                                                                                                                                                                                                                                                                                     | <u>Tower Type "DS1"</u>    |      |          |                |           |                 |                             |                               |                                      |
|          | (i)                                                                                                                                                                                                                                                                                                                     | Basic Tower Body           | No.  | 68       |                |           |                 |                             |                               |                                      |
|          | (ii)                                                                                                                                                                                                                                                                                                                    | 2.0 m Single Leg Extension | No.  | -        |                |           |                 |                             |                               |                                      |
|          | (iii)                                                                                                                                                                                                                                                                                                                   | 4.0 m Single Leg Extension | No.  | 24       |                |           |                 |                             |                               |                                      |
|          | (iv)                                                                                                                                                                                                                                                                                                                    | 6.0 m Single Leg Extension | No.  | 112      |                |           |                 |                             |                               |                                      |
|          | (v)                                                                                                                                                                                                                                                                                                                     | 8.0 m Single Leg Extension | No.  | 136      |                |           |                 |                             |                               |                                      |

|     |                         |                            |     |     |  |  |  |  |  |  |
|-----|-------------------------|----------------------------|-----|-----|--|--|--|--|--|--|
|     | (vi)                    | 6.0 m Body Extension       | No. | 2   |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 272 |  |  |  |  |  |  |
| (b) | <u>Tower Type "DA1"</u> |                            |     |     |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 10  |  |  |  |  |  |  |
|     | (ii)                    | 2.0 m Single Leg Extension | No. | -   |  |  |  |  |  |  |
|     | (iii)                   | 4.0 m Single Leg Extension | No. | -   |  |  |  |  |  |  |
|     | (iv)                    | 6.0 m Single Leg Extension | No. | 24  |  |  |  |  |  |  |
|     | (v)                     | 8.0 m Single Leg Extension | No. | 16  |  |  |  |  |  |  |
|     | (vi)                    | 6.0 m Body Extension       | No. | 2   |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 40  |  |  |  |  |  |  |
| (c) | <u>Tower Type "DD1"</u> |                            |     |     |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 14  |  |  |  |  |  |  |
|     | (ii)                    | 2.0 m Single Leg Extension | No. | 8   |  |  |  |  |  |  |
|     | (iii)                   | 4.0 m Single Leg Extension | No. | 4   |  |  |  |  |  |  |
|     | (iv)                    | 6.0 m Single Leg Extension | No. | 28  |  |  |  |  |  |  |
|     | (v)                     | 8.0 m Single Leg Extension | No. | 16  |  |  |  |  |  |  |
|     | (vi)                    | 6.0 m Body Extension       | No. | 3   |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 56  |  |  |  |  |  |  |
| (d) | <u>Tower Type "TDT"</u> |                            |     |     |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | -   |  |  |  |  |  |  |
|     | (ii)                    | 8.0 m Single Leg Extension | No. | -   |  |  |  |  |  |  |



|          |                                                                                                              |                                                    |                                                       |     |       |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------|-----|-------|--|--|--|--|--|--|
|          |                                                                                                              | (iii)                                              | Stubs                                                 | No. | -     |  |  |  |  |  |  |
|          | <b>Sub-Total A :</b>                                                                                         |                                                    |                                                       |     |       |  |  |  |  |  |  |
| <b>B</b> | <b><u>Conductor and OPGW (With Associated Equipment)</u></b>                                                 |                                                    |                                                       |     |       |  |  |  |  |  |  |
| 1        | Furnish 795 KCM ACSR "Drake" Conductor                                                                       |                                                    |                                                       | km  | 736   |  |  |  |  |  |  |
| 2        | Furnish                                                                                                      |                                                    |                                                       |     |       |  |  |  |  |  |  |
|          | (a)                                                                                                          | OPGW with at least 24 fibers                       |                                                       | km  | 70    |  |  |  |  |  |  |
|          | (b)                                                                                                          | Joint boxes for OPGW                               |                                                       |     |       |  |  |  |  |  |  |
|          |                                                                                                              | (i)                                                | OPGW-OPGW (A Type)                                    | No. | 14    |  |  |  |  |  |  |
|          |                                                                                                              | (ii)                                               | OPGW-OPGW Cable ( B Type)                             | No. | 3     |  |  |  |  |  |  |
|          |                                                                                                              | (iii)                                              | OPGW-attaching Clamps                                 | No. | 1,020 |  |  |  |  |  |  |
|          |                                                                                                              | (iv)                                               | Fibre Optic Approach Cable                            | km  | 6     |  |  |  |  |  |  |
|          | (c)                                                                                                          | Test Equipment, Installation and Maintenance Tools |                                                       |     | -     |  |  |  |  |  |  |
|          |                                                                                                              | -                                                  | Fiber Optic Talk Set (Set comprised two units)        | Set | 1     |  |  |  |  |  |  |
|          |                                                                                                              | -                                                  | Fiber Optic Tool Kit                                  | Set | 1     |  |  |  |  |  |  |
|          |                                                                                                              | -                                                  | OTDR with range ≥ 400km Yokogawa AQ7260 or equivalent | Set | 1     |  |  |  |  |  |  |
|          | <b>Sub Total B :</b>                                                                                         |                                                    |                                                       |     |       |  |  |  |  |  |  |
| <b>C</b> | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b> |                                                    |                                                       |     |       |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                                                                                                         |     |     |  |  |  |  |  |  |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|--|--|--|--|--|--|
| 1 | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001                                                                                       | Set | 408 |  |  |  |  |  |  |
| 2 | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002                                                                                | Set | 144 |  |  |  |  |  |  |
| 3 | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005                                                                      | Set | 288 |  |  |  |  |  |  |
| 4 | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower type 'TDT' including Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing<br>(Note: No. of Insulators in each arm/string = 29 Nos.) as per specification drawing No. 4029/169/401C/TD/01E005a | Set | -   |  |  |  |  |  |  |
| 5 | Furnish Single string Transposition Assembly Upright type "TDTU(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E006<br>(Note: No. of Insulators in each arm/string = 36 Nos.)            | Set | -   |  |  |  |  |  |  |
| 6 | Furnish Single string Transposition Assembly Inverted type "TDTI(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E007<br>(Note: No. of Insulators in each arm/string = 36 Nos.)           | Set | -   |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                                                      |         |   |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---|--|--|--|--|--|--|
| 7        | Furnish Quad string special dead end assemblies type "SDE(4)" for Pre-RTV Coated 160kN E&M strength insulators for tower type "TDT" as per specification drawing No. 4029/169/401C/TD/01E008<br>(Note: No. of Insulators in each arm/string = 29 Nos.)                               | Set     | - |  |  |  |  |  |  |
| 8        | Furnish Pipe Jumper Assembly type "VJT(4)" for Pre-RTV Coated 80kN E&M strength insulators for tower type "TDT" including jumper spacers & special jumper spacers as per specification drawing No. 4029/169/401C/TD/01E009<br>(Note: No. of Insulators in each arm/string = 54 Nos.) | Set     | - |  |  |  |  |  |  |
| 9        | Furnish Special Tension Clamp for tower type "TDT" as per specification                                                                                                                                                                                                              | Set     | - |  |  |  |  |  |  |
| 10       | Furnish Jumper Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                                                                  | Set     | - |  |  |  |  |  |  |
| 11       | Furnish Straight Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                                                                | Set     | - |  |  |  |  |  |  |
| 12       | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                                   | Set     | 6 |  |  |  |  |  |  |
| 13       | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                                  | Set     | 6 |  |  |  |  |  |  |
| 14       | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assemblies (items C1 - 8 & C12-13) with Coulomb or ElecNET software.                                                                                                        | Lumpsum | 1 |  |  |  |  |  |  |
|          | <b>Sub-Total C :</b>                                                                                                                                                                                                                                                                 |         |   |  |  |  |  |  |  |
| <b>D</b> | <b><u>Hardware for OPGW</u></b>                                                                                                                                                                                                                                                      |         |   |  |  |  |  |  |  |

|          |                                                                                                                                                                          |     |       |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|--|--|--|--|--|--|
| 1        | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                    | Set | 136   |  |  |  |  |  |  |
| 2        | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                             | Set | 14    |  |  |  |  |  |  |
| 3        | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                | Set | 48    |  |  |  |  |  |  |
|          | <b>Sub-Total D :</b>                                                                                                                                                     |     |       |  |  |  |  |  |  |
| <b>E</b> | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |     |       |  |  |  |  |  |  |
| 1        | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 | No. | 253   |  |  |  |  |  |  |
| 2        | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      | No. | 127   |  |  |  |  |  |  |
| 3        | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No. | 1,320 |  |  |  |  |  |  |
| 4        | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No. | 3,917 |  |  |  |  |  |  |
| 5        | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor<br>(See Note-3)                                                                               | No. | 979   |  |  |  |  |  |  |
| 6        | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No. | 474   |  |  |  |  |  |  |
|          | <b>Sub-Total E :</b>                                                                                                                                                     |     |       |  |  |  |  |  |  |
|          |                                                                                                                                                                          |     |       |  |  |  |  |  |  |
| <b>F</b> | <b><u>Grounding Material</u></b>                                                                                                                                         |     |       |  |  |  |  |  |  |
| 1        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            | No. | 184   |  |  |  |  |  |  |
| 2        | Furnish flat to cable connector.                                                                                                                                         | No. | 184   |  |  |  |  |  |  |
| 3        | Furnish cable to rod connector.                                                                                                                                          | No. | 184   |  |  |  |  |  |  |

|                      |                                                                                                                                                                                                                                                                                                                        |       |     |  |  |  |  |  |  |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|--|--|--|--|--|--|
| 4                    | Furnish 7 No. 10 copper covered ground wire.                                                                                                                                                                                                                                                                           | Meter | 552 |  |  |  |  |  |  |
| <b>Sub-Total F :</b> |                                                                                                                                                                                                                                                                                                                        |       |     |  |  |  |  |  |  |
| <b>G</b>             | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                                                                                                                                                                    |       |     |  |  |  |  |  |  |
| <b>1</b>             | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                                             |       |     |  |  |  |  |  |  |
|                      | Furnish 500kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |       |     |  |  |  |  |  |  |
|                      | (a) <u>Tower Type "DS1"</u>                                                                                                                                                                                                                                                                                            |       |     |  |  |  |  |  |  |
|                      | (i) Basic Tower Body                                                                                                                                                                                                                                                                                                   | No.   | 7   |  |  |  |  |  |  |
|                      | (ii) 2.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No.   | 4   |  |  |  |  |  |  |
|                      | (iii) 4.0 m Single Leg Extension                                                                                                                                                                                                                                                                                       | No.   | 8   |  |  |  |  |  |  |
|                      | (iv) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No.   | 12  |  |  |  |  |  |  |
|                      | (v) 8.0 m Single Leg Extension                                                                                                                                                                                                                                                                                         | No.   | 12  |  |  |  |  |  |  |
|                      | (vi) 6.0 m Body Extension                                                                                                                                                                                                                                                                                              | No.   | 1   |  |  |  |  |  |  |
|                      | (vii) Stubs                                                                                                                                                                                                                                                                                                            | No.   | 32  |  |  |  |  |  |  |
|                      | (b) <u>Tower Type "DA1"</u>                                                                                                                                                                                                                                                                                            |       |     |  |  |  |  |  |  |
|                      | (i) Basic Tower Body                                                                                                                                                                                                                                                                                                   | No.   | 3   |  |  |  |  |  |  |
|                      | (ii) 2.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No.   | 4   |  |  |  |  |  |  |
|                      | (iii) 4.0 m Single Leg Extension                                                                                                                                                                                                                                                                                       | No.   | -   |  |  |  |  |  |  |
|                      | (iv) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No.   | 4   |  |  |  |  |  |  |
|                      | (v) 8.0 m Single Leg Extension                                                                                                                                                                                                                                                                                         | No.   | 4   |  |  |  |  |  |  |

|                                                              |                                        |                            |     |       |  |  |  |  |  |  |
|--------------------------------------------------------------|----------------------------------------|----------------------------|-----|-------|--|--|--|--|--|--|
|                                                              | (vi)                                   | 6.0 m Body Extension       | No. | 1     |  |  |  |  |  |  |
|                                                              | (vii)                                  | Stubs                      | No. | 12    |  |  |  |  |  |  |
| (c)                                                          | <u>Tower Type "DD1"</u>                |                            |     |       |  |  |  |  |  |  |
|                                                              | (i)                                    | Basic Tower Body           | No. | 3     |  |  |  |  |  |  |
|                                                              | (ii)                                   | 2.0 m Single Leg Extension | No. | 8     |  |  |  |  |  |  |
|                                                              | (iii)                                  | 4.0 m Single Leg Extension | No. | 4     |  |  |  |  |  |  |
|                                                              | (iv)                                   | 6.0 m Single Leg Extension | No. | 4     |  |  |  |  |  |  |
|                                                              | (v)                                    | 8.0 m Single Leg Extension | No. | 4     |  |  |  |  |  |  |
|                                                              | (vi)                                   | 6.0 m Body Extension       | No. | 1     |  |  |  |  |  |  |
|                                                              | (vii)                                  | Stubs                      | No. | 12    |  |  |  |  |  |  |
| (d)                                                          | <u>Tower Type "TDT"</u>                |                            |     |       |  |  |  |  |  |  |
|                                                              | (i)                                    | Basic Tower Body           | No. | -     |  |  |  |  |  |  |
|                                                              | (ii)                                   | 6.0 m Single Leg Extension | No. | -     |  |  |  |  |  |  |
|                                                              | (iii)                                  | Stubs                      | No. | -     |  |  |  |  |  |  |
| <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                                        |                            |     |       |  |  |  |  |  |  |
| 2                                                            | Furnish 795 KCM ACSR "Drake" Conductor |                            | km  | 73.60 |  |  |  |  |  |  |
| 3                                                            | Furnish                                |                            |     |       |  |  |  |  |  |  |
| (a)                                                          | OPGW with at least 24 fibers           |                            | km  | 10    |  |  |  |  |  |  |
| (b)                                                          | Joint boxes for OPGW                   |                            |     |       |  |  |  |  |  |  |
|                                                              | (i)                                    | OPGW-OPGW (A Type)         | No. | 1     |  |  |  |  |  |  |
|                                                              | (ii)                                   | OPGW-OPGW Cable ( B Type)  | No. | -     |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                                    |                            |     |    |  |  |  |  |  |  |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----|----|--|--|--|--|--|--|
|   | (iii)                                                                                                                                                                                                                                                              | OPGW-attaching Clamps      | No. | 60 |  |  |  |  |  |  |
|   | (iv)                                                                                                                                                                                                                                                               | Fibre Optic Approach Cable | km  | -  |  |  |  |  |  |  |
|   | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                                       |                            |     |    |  |  |  |  |  |  |
| 4 | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001                  |                            | Set | 42 |  |  |  |  |  |  |
| 5 | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002           |                            | Set | 36 |  |  |  |  |  |  |
| 6 | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005 |                            | Set | 72 |  |  |  |  |  |  |
| 7 | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                 |                            | Set | 6  |  |  |  |  |  |  |
| 8 | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                |                            | Set | 6  |  |  |  |  |  |  |
|   | <b><u>Hardware for OPGW</u></b>                                                                                                                                                                                                                                    |                            |     |    |  |  |  |  |  |  |
| 9 | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                                              |                            | Set | 14 |  |  |  |  |  |  |

|    |                                                                                                                                                                          |       |     |  |  |  |  |  |   |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|--|--|--|--|--|---|
| 10 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                             | Set   | 2   |  |  |  |  |  |   |
| 11 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                | Set   | 12  |  |  |  |  |  |   |
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |       |     |  |  |  |  |  |   |
| 12 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 | No.   | 25  |  |  |  |  |  |   |
| 13 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      | No.   | 13  |  |  |  |  |  |   |
| 14 | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No.   | 370 |  |  |  |  |  |   |
| 15 | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No.   | 619 |  |  |  |  |  |   |
| 16 | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor                                                                                               | No.   | 155 |  |  |  |  |  |   |
| 17 | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No.   | 78  |  |  |  |  |  |   |
|    | <b><u>Grounding Material</u></b>                                                                                                                                         |       |     |  |  |  |  |  |   |
| 18 | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            | No.   | 26  |  |  |  |  |  |   |
| 19 | Furnish flat to cable connector.                                                                                                                                         | No.   | 26  |  |  |  |  |  |   |
| 20 | Furnish cable to rod connector.                                                                                                                                          | No.   | 26  |  |  |  |  |  |   |
| 21 | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             | Meter | 78  |  |  |  |  |  |   |
|    | <b>Sub-Total of G :</b>                                                                                                                                                  |       |     |  |  |  |  |  | - |
|    | Total of Item A                                                                                                                                                          |       |     |  |  |  |  |  | - |
|    | Total of Item B                                                                                                                                                          |       |     |  |  |  |  |  | - |



|                                                           |  |  |  |  |  |   |
|-----------------------------------------------------------|--|--|--|--|--|---|
| Total of Item C                                           |  |  |  |  |  | - |
| Total of Item D                                           |  |  |  |  |  | - |
| Total of Item E                                           |  |  |  |  |  | - |
| Total of Item F                                           |  |  |  |  |  | - |
| Total of Item G                                           |  |  |  |  |  | - |
| <b>Total of Column 9 to be forwarded to Grand Summary</b> |  |  |  |  |  | - |
|                                                           |  |  |  |  |  |   |

- \* The Bidder shall specify the type of insulator being offered.

**Notes:**

- 1 Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types DS1, DA1, DD1, and TDT, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly.
- 2 The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.
- 3 The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.
- 4 The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.
- 5 The bidder shall be responsible to furnish the tower material, OPGW, conductor, insulators, accessories, dampers & hardware for conductor and OPGW, for completion of line in all respect. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.
- 6 The contractor shall transport, unload and stack leftover/additional material from site to NGC designated Warehouse/Store at its own cost.
- 7 Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.
- 8 The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully before filling up the schedule of prices.

- 9 Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.
- 10 Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.
- 10 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.

**Signature of Bidder**

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**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-III: 500 kV D/C C5-Ludewala – Section A (Approx. 30 km)**

**Schedule No.3 - Design Services**

| Item                                                  | Description | Qty. | Unit Price <sup>1</sup><br>Local<br>Currency | Total Price | Total<br>Provincial<br>Sales Tax |
|-------------------------------------------------------|-------------|------|----------------------------------------------|-------------|----------------------------------|
| 1                                                     | 2           | 3    | 4                                            | 5 = 3 x 4   | 6                                |
| 1                                                     |             | Lot  |                                              |             |                                  |
| NOT APPLICABLE                                        |             |      |                                              |             |                                  |
| TOTAL Column 5 to be carried forward to Grand Summary |             |      |                                              |             |                                  |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>1</sup>*Specify currency in accordance ITB 12.*

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme  
Lot-III: 500 kV D/C C5-Ludewala —Section A (Approx. 30 km)**

**SCHEDULE NO.4 - INSTALLATION AND OTHER SERVICES**

**(INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)**

| Item No. | Description                                                                               | Unit     | Qty | Unit Price (PKR) | Total Price (PKR) Including all Custom duties, taxes and other levies etc. w/o Provincial Sales Tax | Total Provincial Sales tax (PST) in PKR |
|----------|-------------------------------------------------------------------------------------------|----------|-----|------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------|
| 1        | 2                                                                                         | 3        | 4   | 5                | 6=4*5                                                                                               | 7                                       |
|          | <b>INSTALLATION (INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)</b> |          |     |                  |                                                                                                     |                                         |
| A        | <u>Survey</u>                                                                             |          |     |                  |                                                                                                     |                                         |
| 1        | Clearing Right of Way (ROW)                                                               | Lump Sum | 1   |                  |                                                                                                     |                                         |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |    |  |  |  |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----|--|--|--|
| 2        | Validation of already established centre line prior to foundation construction and preparation of as-built plan & profile drawings of the already prepared plan & profile drawings using PLS-CADD and construction structure lists (to be provided to the Contractor after award of contract) of the constructed transmission line after incorporating all the changes and submitted to the Project Manager. In case of route diversion, payment of the diverted portion will be made as per item A.3 | km        | 30 |  |  |  |
| 3        | Route alignment and detailed surveying of diverted portion not limited to chainage and leveling, preparation of plan & profile drawings, spotting of towers and preparation of construction structure list & Latitude & Longitude with hand held GPS of each tower location                                                                                                                                                                                                                           | km        | 3  |  |  |  |
|          | <b>Sub-Total A:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |    |  |  |  |
| <b>B</b> | <b><u>Sub-soil Investigations:</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |    |  |  |  |
|          | Sub-Soil Investigation for T/Line at (ii) and confirmatory sub-soil Investigation in varied soil/boulder/rock (including laboratory tests) as per Specifications (Technical Provisions for Construction Clause 10.2) and submission of Sub-Soil Investigation Report.                                                                                                                                                                                                                                 |           |    |  |  |  |
| (a)      | From NSL to depth of 15 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Lin. Mtr. | 45 |  |  |  |
| (b)      | From 15 m to depth of 25 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Lin. Mtr. | 10 |  |  |  |
| (c)      | Hand Auger upto depth of 10m                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Lin. Mtr. | 30 |  |  |  |
|          | <b>Sub-Total B:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |    |  |  |  |
| <b>C</b> | <b><u>Foundations</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |    |  |  |  |

|          |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |    |  |  |  |
|----------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----|--|--|--|
|          |                                | Reinforced Concrete Spread Foundations (4 legs) complete in all respect in varied soil as well as boulders/rock complete with supply of materials including alignment, peg marking, access, preparatory works, excavation, blasting, leveling, grading of tower site, cutting, dewatering, shuttering, reinforcement, concreting (using Sulphate Resistance Cement conforming to ASTM C-150 Type-V), lean concrete (if required), curing, backfilling of foundations after concreting with excavated/borrowed earth (irrespective of lead), application of three (03) coats hot bitumen (ExpanProof* 10 – Fospak bitumen and compaction of backfill material in layers, stub setting and site restoration etc. including tower staking (Latitude & Longitude with hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type as per drawings and specifications: |            |    |  |  |  |
|          | (a)                            | DS1 (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G010                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |    |  |  |  |
|          | (i)                            | Foundation Type D1 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 5  |  |  |  |
|          | (ii)                           | Foundation Type D2 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 30 |  |  |  |
|          | (iii)                          | Foundation Type D3 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 24 |  |  |  |
|          | (iv)                           | Foundation Type S (Semi-Submerged)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Foundation | 2  |  |  |  |
|          | (b)                            | DA1 (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |    |  |  |  |
|          | (i)                            | Foundation Type D1 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 2  |  |  |  |
|          | (ii)                           | Foundation Type D2 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 4  |  |  |  |
|          | (iii)                          | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Foundation | 0  |  |  |  |
|          | (c)                            | DD1 (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G012                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |    |  |  |  |
|          | (i)                            | Foundation Type D1 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 2  |  |  |  |
|          | (ii)                           | Foundation Type D2 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 2  |  |  |  |
|          | (iii)                          | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Foundation | 0  |  |  |  |
|          | <b>Sub-Total C:</b>            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |    |  |  |  |
| <b>D</b> | <b><u>Pile Foundations</u></b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |    |  |  |  |

|  |     |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |          |  |  |  |
|--|-----|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|--|--|--|
|  | D-1 |       | Reinforced concrete pile foundations (cast in situ installation) complete in all type of soil as well as boulders/gravels/rock with supply of materials including excavation, drilling/boring, shuttering, reinforcement, concreting, bitumen coating, backfilling, installation of Stubs, tower grounding, site clearing etc. using Sulphate Resistance Cement conforming to ASTM C-150 Type-V shall be used including tower staking (Latitude & Longitude with RTK/hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type: |            |          |  |  |  |
|  | (a) |       | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DS1, and drawing No. <b>4029/169/TLC-22/TD/01G014</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Foundation | <b>3</b> |  |  |  |
|  | (b) |       | Reinforced concrete single pile per footing 900 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G014</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |          |  |  |  |
|  |     | (i)   | Pile shaft upto depth of 15 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Lin.mtr    | 180      |  |  |  |
|  |     | (ii)  | Pile shaft depth 15 - 20 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lin.mtr    | 20       |  |  |  |
|  | (c) |       | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DA1, and drawing No. <b>4029/169/TLC-22/TD/01G015</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Foundation | <b>2</b> |  |  |  |
|  | (d) |       | Reinforced concrete single pile per footing 1200 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G015</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |          |  |  |  |
|  |     | (i)   | Pile shaft upto depth of 15 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Lin.mtr    | 120      |  |  |  |
|  |     | (ii)  | Pile shaft depth 15 - 20 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lin.mtr    | 40       |  |  |  |
|  |     | (iii) | Pile shaft depth 20 - 25 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lin.mtr    | 40       |  |  |  |
|  | (e) |       | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DD1/DT1, and drawing No. <b>4029/169/TLC-22/TD/01G016</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Foundation | <b>4</b> |  |  |  |

|          |                                                                                                                                                                                                                                                                  |                                                                                                                                                           |            |       |  |  |  |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------|--|--|--|
|          | (f)                                                                                                                                                                                                                                                              | Reinforced concrete single pile per footing 1500 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G016</b> (including steel liner/casing), if required. |            |       |  |  |  |
|          | (i)                                                                                                                                                                                                                                                              | Pile shaft upto depth of 20 m                                                                                                                             | Lin.mtr    | 320   |  |  |  |
|          | (ii)                                                                                                                                                                                                                                                             | Pile shaft depth 20 - 25 m                                                                                                                                | Lin.mtr    | 80    |  |  |  |
|          | (iii)                                                                                                                                                                                                                                                            | Pile shaft depth 25 - 30 m                                                                                                                                | Lin.mtr    | 20    |  |  |  |
| D-2      |                                                                                                                                                                                                                                                                  | Pile load test in compression confirming to ASTM D1143 / D1143M and in uplift confirming to ASTM D3689 / D3689M at 2.5 times of tower foundation loads    |            |       |  |  |  |
|          | (i)                                                                                                                                                                                                                                                              | DD1/DT1 (In Compression)                                                                                                                                  | Pile       | 1     |  |  |  |
|          | (ii)                                                                                                                                                                                                                                                             | DD1/DT1 (In Tension/Uplift)                                                                                                                               | Pile       | 1     |  |  |  |
|          | (iii)                                                                                                                                                                                                                                                            | Reinforced concrete single Test pile per footing 1500 mm dia. as per drawing No. 4029/169/TLC-22/TD/01G016 (including steel liner/casing), if required.   |            | 2     |  |  |  |
|          | (a)                                                                                                                                                                                                                                                              | Pile shaft upto depth of 20 m                                                                                                                             | Lin.mtr    | 40    |  |  |  |
|          | (b)                                                                                                                                                                                                                                                              | Pile shaft depth 20 - 25 m                                                                                                                                | Lin.mtr    | 10    |  |  |  |
|          | (c)                                                                                                                                                                                                                                                              | Pile shaft depth 25 - 30 m                                                                                                                                | Lin.mtr    | 10    |  |  |  |
| D-3      |                                                                                                                                                                                                                                                                  | Sonic Integrity Test at pile foundation confirming to ASTM D5882                                                                                          | No.        | 9     |  |  |  |
|          | <b>Sub-Total D:</b>                                                                                                                                                                                                                                              |                                                                                                                                                           |            |       |  |  |  |
| <b>E</b> | <b><u>Erection of Steel Towers</u></b>                                                                                                                                                                                                                           |                                                                                                                                                           |            |       |  |  |  |
| 1        | Transport and Install 500kV double circuit tower types 'DS1', 'DA1', 'DD1' & TDT with all accessories i.e anti climbing devices, aerial markers number plates, danger signs, phase plates, Bird Guards etc. in accordance with requirements of Bidding Documents |                                                                                                                                                           | Ton        | 2,995 |  |  |  |
| 2        | Welding of erected tower bolts & nuts after final inspection upto height of 8.0 m from top of foundation chimney as per specification drawing                                                                                                                    |                                                                                                                                                           | Each tower | 92    |  |  |  |
|          | <b>Sub-Total E:</b>                                                                                                                                                                                                                                              |                                                                                                                                                           |            |       |  |  |  |



|          |                                                                                                                                                                                                                                                                                 |                    |      |  |   |   |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------|--|---|---|
| <b>F</b> | <b><u>Stringing of Conductor and OPGW</u></b>                                                                                                                                                                                                                                   |                    |      |  |   |   |
| 1        | Transport & Install 795KCM ACSR Drake for quad conductor configuration insulator hanging, hardware assemblies, accessories & dampers etc. complete in all respects as per specifications & approved drawings and methodology.                                                   | km D/C Quad Bundle | 30   |  |   |   |
| 2        | Transport & Install OPGW including installation of drop down lengths for joint boxes at the towers along with allied hardware material including hardware assemblies, joint boxes accessories, dampers etc. complete in all respects as per specifications & approved drawings. | km (on Both Peaks) | 30   |  |   |   |
|          | <b>Sub-Total F:</b>                                                                                                                                                                                                                                                             |                    |      |  |   |   |
| <b>G</b> | <b><u>Testing &amp; Commissioning</u></b>                                                                                                                                                                                                                                       |                    |      |  |   |   |
| 1        | Testing and commissioning of the line                                                                                                                                                                                                                                           | Lumpsum            | 1    |  |   |   |
|          | <b>Sub-Total G:</b>                                                                                                                                                                                                                                                             |                    |      |  |   |   |
| <b>H</b> | <b><u>ENVIRONMENTAL AND SOCIAL SAFEGUARDS</u></b>                                                                                                                                                                                                                               |                    |      |  |   |   |
| 1        | Tree Plantation (Minimum height 4 feet)                                                                                                                                                                                                                                         | No.                | 3000 |  |   |   |
| 2        | Water quality monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route.                                                                                                                                            | No.                | 28   |  |   |   |
| 3        | Ambient Air monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route.                                                                                                                                              | No.                | 28   |  |   |   |
| 4        | Noise monitoring / analysis / measurement on quarterly basis for the whole project period at three locations along the TL route.                                                                                                                                                | No.                | 28   |  |   |   |
|          | <b>Sub-Total H:</b>                                                                                                                                                                                                                                                             |                    |      |  | - | - |

|                                                                |                                                                             |        |      |  |  |  |
|----------------------------------------------------------------|-----------------------------------------------------------------------------|--------|------|--|--|--|
|                                                                |                                                                             |        |      |  |  |  |
| <b>I</b>                                                       | <b><u>INSTALLATION SERVICES FOR ADDITIONAL WORK</u></b>                     |        |      |  |  |  |
| 1                                                              | Grading/Cutting/Excavation (Dry Soil)                                       | Cu. m. | 50   |  |  |  |
| 2                                                              | Excavation (semi-submerged soil)                                            | Cu. m. | 35   |  |  |  |
| 3                                                              | Excavation (submerged soil)                                                 | Cu. m. | 40   |  |  |  |
| 4                                                              | Blasting/Cutting/Excavation/Grading (boulder/Rock)                          | Cu. m. | 50   |  |  |  |
| 5                                                              | Concrete (3000 psi at 28 days) furnished and installed                      | Cu. m. | 100  |  |  |  |
| 6                                                              | Concrete (4000 psi at 28 days) furnished and installed                      | Cu. m. | 25   |  |  |  |
| 7                                                              | Reinforcing Bars furnished and installed (Grade-60)                         | kg     | 1000 |  |  |  |
| 8                                                              | Overhaul from Borrow and Compaction (regardless of the distance for borrow) | Cu. m. | 100  |  |  |  |
| 9                                                              | Lean concrete furnished and installed (2000 psi strength at 28 days)        | Cu. m. | 70   |  |  |  |
| 10                                                             | Compacted crush+sand (50:50 ratio) installed under footings                 | Cu. m. | 50   |  |  |  |
| 11                                                             | Bitumen coating for footing                                                 | Sq. m  | 50   |  |  |  |
| 12                                                             | Compacted Backfill                                                          | Cu. m. | 100  |  |  |  |
|                                                                | <b>Sub-Total I:</b>                                                         |        |      |  |  |  |
|                                                                | <b>Total of Item A</b>                                                      |        |      |  |  |  |
|                                                                | <b>Total of Item B</b>                                                      |        |      |  |  |  |
|                                                                | <b>Total of Item C</b>                                                      |        |      |  |  |  |
|                                                                | <b>Total of Item D</b>                                                      |        |      |  |  |  |
|                                                                | <b>Total of Item E</b>                                                      |        |      |  |  |  |
|                                                                | <b>Total of Item F</b>                                                      |        |      |  |  |  |
|                                                                | <b>Total of Item G</b>                                                      |        |      |  |  |  |
|                                                                | <b>Total of Item H</b>                                                      |        |      |  |  |  |
|                                                                | <b>Total of Item I</b>                                                      |        |      |  |  |  |
| <b>Total (Column 6) to be carried forward to Grand Summary</b> |                                                                             |        |      |  |  |  |

**Notes:**

- 1 The quantities mentioned in the BOQ are estimated quantities. These quantities are to be used for bid evaluation purpose only. The actual quantities may vary depending upon detailed engineering and approved drawings. However, the unit rates for material and service quoted in the BOQ/ bid shall remain firm and final if design is unchanged.
- 2 Price of any other item specifically not covered in the Price Schedules but is required for the completion, commissioning and operation of the transmission line shall be deemed to be included in the Price Schedules.
- 3 In case of failure by the bidder to fill the price of Sales Tax in relevant column, the quoted price of the bidder will be considered inclusive of Sales Tax applicable as per Lax and relevant provisions of the Bidding Documents. In case the bidder takes deviation or mention that prices are exclusive of PST, his bid shall be considered as non-responsive.
- 4 Foundation means four legs of tower.
- 5 An allowance of two percent (2%) of the total installed quantity will be permitted for sag, jumpers and wastage for the conductor, one percent (1%) for OPGW and two percent (2%) for lossage of nuts, bolts and washers (for towers only); and one percent (1%) for insulator breakage. These allowances are the maximum permissible and in case of wastage less than these limits all excess material shall be returned to NGC storage yards by the Contractor. For quantities in excess of these limits, the Contractor shall replace or reimburse NGC for the loss. All unused, above allowable limits of waste materials and packing wood are the property of NGC and shall be returned to NGC storage yards by the Contractor.
- 6 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.
- 7 The Bidder shall quote prices against all items, including those for which the specified quantity is "0". No item shall be left blank or unpriced in the Price Schedule.
- 8 Pile Foundation design will be release after the submission of Pile load test Report.
- 9 Location for Sonic Integrity and sonic integrity test report approval will be accorded by the office of DG (C&SE) NGC.

**Name of Bidder****Signature of Bidder**

| <b>Design, Manufacture, Procurement, Supply, Laying, Installation, Testing &amp; Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme</b><br><b>Lot-III: 500 kV D/C C5-Ludewala —Section A (Approx. 30 km)</b> |                                                                                                  |                                   |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------|
| <b><u>SCHEDULE NO. 5 - GRAND SUMMARY</u></b>                                                                                                                                                                                         |                                                                                                  |                                   |                                       |
| <b>Sr. No.</b>                                                                                                                                                                                                                       | <b>Description</b>                                                                               | <b>Bid Prices</b>                 |                                       |
|                                                                                                                                                                                                                                      |                                                                                                  | <b>Foreign Currency Component</b> | <b>Local Currency Component (PKR)</b> |
| 1                                                                                                                                                                                                                                    | Total Schedule No. 1 Plant and Mandatory Spare Parts Supplied from Abroad                        |                                   | -                                     |
| 2                                                                                                                                                                                                                                    | Total Schedule No. 2 Plant and Mandatory Spare Parts Supplied from Within the Employer's Country | -                                 | -                                     |
| 3                                                                                                                                                                                                                                    | Total Schedule No. 3 Design Services                                                             | -                                 |                                       |
| 4                                                                                                                                                                                                                                    | Total Schedule No. 4 Installation and Other Services                                             |                                   |                                       |
| 5                                                                                                                                                                                                                                    | Provisional Sum                                                                                  | -                                 | 1,600 Million                         |
| <b>GRAND TOTAL to be carried forward to Letter of Price Bid</b>                                                                                                                                                                      |                                                                                                  |                                   |                                       |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

- 1 Specify the currency in accordance with ITB 12 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-III: 500 kV D/C C5-Ludewala – Section A (Approx. 30 km)**

**Schedule No. 6 - Recommended Spare Parts**

| Item | Description    | Qty | Unit Price                              |                                                 | Total Price                  |                                |
|------|----------------|-----|-----------------------------------------|-------------------------------------------------|------------------------------|--------------------------------|
|      |                |     | EXW<br>Local Parts<br>Local<br>Currency | CIP<br>Imported<br>Parts<br>Foreign<br>Currency | Local<br>Currency<br>Portion | Foreign<br>Currency<br>Portion |
| 1    | 2              | 3   | 4                                       | 5                                               | 6 = 3 x 4                    | 7 = 3 x 5                      |
|      | NOT APPLICABLE |     |                                         |                                                 |                              |                                |
|      |                |     |                                         |                                                 |                              |                                |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

## **Schedules of Rates and Prices**

### **(LOT-IV)**

| Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme |                                                                                                                                                                                                                                                                                                                         |                                  |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|------------------------|------|----------|-----------------------------------|-----------|------------------------------------|-----------|-----------------------------|--------------------------------|----------|----------------|
| Lot-IV: 500 kV D/C C5-Ludewala —Section B (Approx. 32 km)                                                                                            |                                                                                                                                                                                                                                                                                                                         |                                  |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| SCHEDULE NO.1- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM ABROAD                                                                                  |                                                                                                                                                                                                                                                                                                                         |                                  |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| Item No.                                                                                                                                             | Description                                                                                                                                                                                                                                                                                                             |                                  | Code Country of Origin | Unit | Quantity | Unit Price (CIF Pakistan Seaport) |           | Total Price (CIF Pakistan Seaport) |           | Total Inland Transportation | Total Price CIP (Project Site) |          | Taxes & Duties |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                         |                                  |                        |      |          | CFR                               | Insurance | CFR                                | Insurance |                             | FCC                            | LCC      | Local Currency |
| 1                                                                                                                                                    | 2                                                                                                                                                                                                                                                                                                                       |                                  | 3                      | 4    | 5        | 6                                 | 7         | 8=5 x 6                            | 9 = 5 x 7 | 10                          | 11=8                           | 12= 9+10 | 13             |
|                                                                                                                                                      | 500kV Double Circuit Transmission Line                                                                                                                                                                                                                                                                                  |                                  |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| A                                                                                                                                                    | Steel Towers                                                                                                                                                                                                                                                                                                            |                                  |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| 1                                                                                                                                                    | Furnish 500 kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                                  |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      | (a)                                                                                                                                                                                                                                                                                                                     | Tower Type "DS1"                 |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                         | (i) Basic Tower Body             |                        | No.  | 80       |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                         | (ii) 2.0 m Single Leg Extension  |                        | No.  | -        |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                         | (iii) 4.0 m Single Leg Extension |                        | No.  | 44       |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                         | (iv) 6.0 m Single Leg Extension  |                        | No.  | 196      |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                         | (v) 8.0 m Single Leg Extension   |                        | No.  | 80       |                                   |           |                                    |           |                             |                                |          |                |

|     |                         |                            |     |     |  |  |  |  |  |  |  |  |  |
|-----|-------------------------|----------------------------|-----|-----|--|--|--|--|--|--|--|--|--|
|     | (vi)                    | 6.0 m Body Extension       | No. | -   |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 320 |  |  |  |  |  |  |  |  |  |
| (b) | <u>Tower Type "DA1"</u> |                            |     |     |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 9   |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 2.0 m Single Leg Extension | No. | -   |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 4.0 m Single Leg Extension | No. | -   |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 6.0 m Single Leg Extension | No. | 28  |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 8.0 m Single Leg Extension | No. | 8   |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 6.0 m Body Extension       | No. | 1   |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 36  |  |  |  |  |  |  |  |  |  |
| (c) | <u>Tower Type "DD1"</u> |                            |     |     |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 6   |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 2.0 m Single Leg Extension | No. | -   |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 4.0 m Single Leg Extension | No. | -   |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 6.0 m Single Leg Extension | No. | 20  |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 8.0 m Single Leg Extension | No. | 4   |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 6.0 m Body Extension       | No. | 1   |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 24  |  |  |  |  |  |  |  |  |  |
| (d) | <u>Tower Type "TDT"</u> |                            |     |     |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 2   |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 4.0 m Single Leg Extension | No. | 4   |  |  |  |  |  |  |  |  |  |



|          |                                                                                                              |                                                    |                                                                      |  |     |     |  |  |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------------|--|-----|-----|--|--|--|--|--|--|--|--|
|          |                                                                                                              | (iii)                                              | 6.0 m Single Leg Extension                                           |  | No. | 4   |  |  |  |  |  |  |  |  |
|          |                                                                                                              | (iv)                                               | Stubs                                                                |  | No. | 8   |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total A :</b>                                                                                         |                                                    |                                                                      |  |     |     |  |  |  |  |  |  |  |  |
| <b>B</b> | <b><u>Conductor and OPGW (With Associated Equipment)</u></b>                                                 |                                                    |                                                                      |  |     |     |  |  |  |  |  |  |  |  |
| 1        | Furnish 795 KCM ACSR "Drake" Conductor                                                                       |                                                    |                                                                      |  | km  | 784 |  |  |  |  |  |  |  |  |
| 2        | Furnish                                                                                                      |                                                    |                                                                      |  |     |     |  |  |  |  |  |  |  |  |
|          | (a)                                                                                                          | OPGW with at least 24 fibers                       |                                                                      |  | km  | 75  |  |  |  |  |  |  |  |  |
|          | (b)                                                                                                          | Joint boxes for OPGW                               |                                                                      |  |     |     |  |  |  |  |  |  |  |  |
|          |                                                                                                              | (i)                                                | OPGW-OPGW (A Type)                                                   |  | No. | 15  |  |  |  |  |  |  |  |  |
|          |                                                                                                              | (ii)                                               | OPGW-OPGW Cable ( B Type)                                            |  | No. | -   |  |  |  |  |  |  |  |  |
|          |                                                                                                              | (iii)                                              | OPGW-attaching Clamps                                                |  | No. | 900 |  |  |  |  |  |  |  |  |
|          |                                                                                                              | (iv)                                               | Fibre Optic Approach Cable                                           |  | km  | -   |  |  |  |  |  |  |  |  |
|          | (c)                                                                                                          | Test Equipment, Installation and Maintenance Tools |                                                                      |  |     | -   |  |  |  |  |  |  |  |  |
|          |                                                                                                              | -                                                  | Fiber Optic Talk Set (Set comprised two units)                       |  | Set | 1   |  |  |  |  |  |  |  |  |
|          |                                                                                                              | -                                                  | Fiber Optic Tool Kit                                                 |  | Set | 1   |  |  |  |  |  |  |  |  |
|          |                                                                                                              | -                                                  | OTDR with range $\geq 400\text{km}$<br>Yokogawa AQ7260 or equivalent |  | Set | 1   |  |  |  |  |  |  |  |  |
|          | <b>Sub Total B :</b>                                                                                         |                                                    |                                                                      |  |     |     |  |  |  |  |  |  |  |  |
| <b>C</b> | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b> |                                                    |                                                                      |  |     |     |  |  |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                                                                                                         |  |     |     |  |  |  |  |  |  |  |  |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|-----|--|--|--|--|--|--|--|--|
| 1 | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001                                                                                       |  | Set | 480 |  |  |  |  |  |  |  |  |
| 2 | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002                                                                                |  | Set | 90  |  |  |  |  |  |  |  |  |
| 3 | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005                                                                      |  | Set | 180 |  |  |  |  |  |  |  |  |
| 4 | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower type 'TDT' including Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing<br>(Note: No. of Insulators in each arm/string = 29 Nos.) as per specification drawing No. 4029/169/401C/TD/01E005a |  | Set | 16  |  |  |  |  |  |  |  |  |
| 5 | Furnish Single string Transposition Assembly Upright type "TDTU(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E006<br>(Note: No. of Insulators in each arm/string = 36 Nos.)            |  | Set | 8   |  |  |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                                                                                                               |  |     |     |  |  |  |  |  |  |  |  |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|-----|--|--|--|--|--|--|--|--|
| 6  | Furnish Single string Transposition Assembly Inverted type "TDTI(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E007<br>(Note: No. of Insulators in each arm/string = 36 Nos.) |  | Set | 8   |  |  |  |  |  |  |  |  |
| 7  | Furnish Quad string special dead end assemblies type "SDE(4)" for Pre-RTV Coated 160kN E&M strength insulators for tower type "TDT" as per specification drawing No. 4029/169/401C/TD/01E008<br>(Note: No. of Insulators in each arm/string = 29 Nos.)                                                                        |  | Set | 8   |  |  |  |  |  |  |  |  |
| 8  | Furnish Pipe Jumper Assembly type "VJT(4)" for Pre-RTV Coated 80kN E&M strength insulators for tower type "TDT" including jumper spacers & special jumper spacers as per specification drawing No. 4029/169/401C/TD/01E009<br>(Note: No. of Insulators in each arm/string = 54 Nos.)                                          |  | Set | 8   |  |  |  |  |  |  |  |  |
| 9  | Furnish Special Tension Clamp for tower type "TDT" as per specification                                                                                                                                                                                                                                                       |  | Set | 32  |  |  |  |  |  |  |  |  |
| 10 | Furnish Jumper Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                                                                                                           |  | Set | 128 |  |  |  |  |  |  |  |  |
| 11 | Furnish Straight Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                                                                                                         |  | Set | 32  |  |  |  |  |  |  |  |  |
| 12 | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                                                                            |  | Set | 6   |  |  |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                     |         |       |  |  |  |  |  |  |  |  |  |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------|--|--|--|--|--|--|--|--|--|
| 13       | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011 | Set     | 6     |  |  |  |  |  |  |  |  |  |
| 14       | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assemblies (items C1 - 8 & C12-13) with Coulomb or ElecNET software.                                                                       | Lumpsum | 1     |  |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total C :</b>                                                                                                                                                                                                                                |         |       |  |  |  |  |  |  |  |  |  |
| <b>D</b> | <b><u>Hardware for OPGW</u></b>                                                                                                                                                                                                                     |         |       |  |  |  |  |  |  |  |  |  |
| 1        | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                               | Set     | 160   |  |  |  |  |  |  |  |  |  |
| 2        | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                                                                                                        | Set     | 15    |  |  |  |  |  |  |  |  |  |
| 3        | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                                                                                           | Set     | 34    |  |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total D :</b>                                                                                                                                                                                                                                |         |       |  |  |  |  |  |  |  |  |  |
| <b>E</b> | <b><u>Accessories and Dampers</u></b>                                                                                                                                                                                                               |         |       |  |  |  |  |  |  |  |  |  |
| 1        | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                                                                                            | No.     | 270   |  |  |  |  |  |  |  |  |  |
| 2        | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                                                                                                 | No.     | 135   |  |  |  |  |  |  |  |  |  |
| 3        | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor.                                                                            | No.     | 845   |  |  |  |  |  |  |  |  |  |
| 4        | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                                                                                           | No.     | 3,920 |  |  |  |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                                                                                        |                                |                            |       |     |  |  |  |  |  |  |  |  |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|----------------------------|-------|-----|--|--|--|--|--|--|--|--|
| 5        | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor (See Note-3)                                                                                                                                                                                                                                |                                |                            | No.   | 980 |  |  |  |  |  |  |  |  |
| 6        | Furnish stock bridge vibration dampers for OPGW.                                                                                                                                                                                                                                                                       |                                |                            | No.   | 463 |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total E :</b>                                                                                                                                                                                                                                                                                                   |                                |                            |       |     |  |  |  |  |  |  |  |  |
| <b>F</b> | <b><u>Grounding Material</u></b>                                                                                                                                                                                                                                                                                       |                                |                            |       |     |  |  |  |  |  |  |  |  |
| 1        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                                                                                                                                                                          |                                |                            | No.   | 194 |  |  |  |  |  |  |  |  |
| 2        | Furnish flat to cable connector.                                                                                                                                                                                                                                                                                       |                                |                            | No.   | 194 |  |  |  |  |  |  |  |  |
| 3        | Furnish cable to rod connector.                                                                                                                                                                                                                                                                                        |                                |                            | No.   | 194 |  |  |  |  |  |  |  |  |
| 4        | Furnish 7 No. 10 copper covered ground wire.                                                                                                                                                                                                                                                                           |                                |                            | Meter | 582 |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total F :</b>                                                                                                                                                                                                                                                                                                   |                                |                            |       |     |  |  |  |  |  |  |  |  |
| <b>G</b> | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                                                                                                                                                                    |                                |                            |       |     |  |  |  |  |  |  |  |  |
| <b>1</b> | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                                             |                                |                            |       |     |  |  |  |  |  |  |  |  |
|          | Furnish 500kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                                |                            |       |     |  |  |  |  |  |  |  |  |
|          | (a)                                                                                                                                                                                                                                                                                                                    | <b><u>Tower Type "DS1"</u></b> |                            |       |     |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (i)                            | Basic Tower Body           | No.   | 8   |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (ii)                           | 2.0 m Single Leg Extension | No.   | 4   |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (iii)                          | 4.0 m Single Leg Extension | No.   | 8   |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (iv)                           | 6.0 m Single Leg Extension | No.   | 20  |  |  |  |  |  |  |  |  |

|     |                         |                            |     |    |  |  |  |  |  |  |  |  |  |
|-----|-------------------------|----------------------------|-----|----|--|--|--|--|--|--|--|--|--|
|     | (v)                     | 8.0 m Single Leg Extension | No. | 8  |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 6.0 m Body Extension       | No. | 1  |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 32 |  |  |  |  |  |  |  |  |  |
| (b) | <u>Tower Type "DA1"</u> |                            |     |    |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 3  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 2.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 4.0 m Single Leg Extension | No. | -  |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 6.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 8.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 6.0 m Body Extension       | No. | 1  |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 12 |  |  |  |  |  |  |  |  |  |
| (c) | <u>Tower Type "DD1"</u> |                            |     |    |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 3  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 2.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 4.0 m Single Leg Extension | No. | -  |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 6.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 8.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 6.0 m Body Extension       | No. | 1  |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 12 |  |  |  |  |  |  |  |  |  |
| (d) | <u>Tower Type "TDT"</u> |                            |     |    |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | -  |  |  |  |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                          |                              |     |       |  |  |  |  |  |  |  |  |  |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----|-------|--|--|--|--|--|--|--|--|--|
|   | (ii)                                                                                                                                                                                                                                                     | 6.0 m Single Leg Extension   | No. | -     |  |  |  |  |  |  |  |  |  |
|   | (iii)                                                                                                                                                                                                                                                    | Stubs                        | No. | -     |  |  |  |  |  |  |  |  |  |
|   | <b><u>Conductor and OPGW (With Associated Equipment)</u></b>                                                                                                                                                                                             |                              |     |       |  |  |  |  |  |  |  |  |  |
| 2 | Furnish 795 KCM ACSR "Drake" Conductor                                                                                                                                                                                                                   |                              | km  | 76.80 |  |  |  |  |  |  |  |  |  |
| 3 | Furnish                                                                                                                                                                                                                                                  |                              |     |       |  |  |  |  |  |  |  |  |  |
|   | (a)                                                                                                                                                                                                                                                      | OPGW with at least 24 fibers | km  | 10    |  |  |  |  |  |  |  |  |  |
|   | (b)                                                                                                                                                                                                                                                      | Joint boxes for OPGW         |     |       |  |  |  |  |  |  |  |  |  |
|   | (i)                                                                                                                                                                                                                                                      | OPGW-OPGW (A Type)           | No. | 2     |  |  |  |  |  |  |  |  |  |
|   | (ii)                                                                                                                                                                                                                                                     | OPGW-OPGW Cable ( B Type)    | No. | -     |  |  |  |  |  |  |  |  |  |
|   | (iii)                                                                                                                                                                                                                                                    | OPGW-attaching Clamps        | No. | 120   |  |  |  |  |  |  |  |  |  |
|   | (iv)                                                                                                                                                                                                                                                     | Fibre Optic Approach Cable   | km  | -     |  |  |  |  |  |  |  |  |  |
|   | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                             |                              |     |       |  |  |  |  |  |  |  |  |  |
| 4 | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001        |                              | Set | 48    |  |  |  |  |  |  |  |  |  |
| 5 | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002 |                              | Set | 36    |  |  |  |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                                                    |  |     |    |  |  |  |  |  |  |  |  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|----|--|--|--|--|--|--|--|--|
| 6  | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005 |  | Set | 72 |  |  |  |  |  |  |  |  |
| 7  | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                 |  | Set | 6  |  |  |  |  |  |  |  |  |
| 8  | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                |  | Set | 6  |  |  |  |  |  |  |  |  |
|    | <b><u>Hardware for OPGW</u></b>                                                                                                                                                                                                                                    |  |     |    |  |  |  |  |  |  |  |  |
| 9  | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                                              |  | Set | 16 |  |  |  |  |  |  |  |  |
| 10 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                                                                                                                       |  | Set | 2  |  |  |  |  |  |  |  |  |
| 11 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                                                                                                          |  | Set | 12 |  |  |  |  |  |  |  |  |
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                                                                                                              |  |     |    |  |  |  |  |  |  |  |  |
| 12 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                                                                                                           |  | No. | 26 |  |  |  |  |  |  |  |  |
| 13 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                                                                                                                |  | No. | 13 |  |  |  |  |  |  |  |  |



|                                                                                     |                                                                                                                                                                          |  |       |     |  |  |  |  |  |  |  |   |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------|-----|--|--|--|--|--|--|--|---|
| 14                                                                                  | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. |  | No.   | 370 |  |  |  |  |  |  |  |   |
| 15                                                                                  | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                |  | No.   | 655 |  |  |  |  |  |  |  |   |
| 16                                                                                  | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor                                                                                               |  | No.   | 164 |  |  |  |  |  |  |  |   |
| 17                                                                                  | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         |  | No.   | 82  |  |  |  |  |  |  |  |   |
|                                                                                     | <b><u>Grounding Material</u></b>                                                                                                                                         |  |       |     |  |  |  |  |  |  |  |   |
| 18                                                                                  | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            |  | No.   | 28  |  |  |  |  |  |  |  |   |
| 19                                                                                  | Furnish flat to cable connector.                                                                                                                                         |  | No.   | 28  |  |  |  |  |  |  |  |   |
| 20                                                                                  | Furnish cable to rod connector.                                                                                                                                          |  | No.   | 28  |  |  |  |  |  |  |  |   |
| 21                                                                                  | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             |  | Meter | 84  |  |  |  |  |  |  |  |   |
|                                                                                     | <b>Sub-Total of G :</b>                                                                                                                                                  |  |       |     |  |  |  |  |  |  |  | - |
|                                                                                     | Total of Item A                                                                                                                                                          |  |       |     |  |  |  |  |  |  |  | - |
|                                                                                     | Total of Item B                                                                                                                                                          |  |       |     |  |  |  |  |  |  |  | - |
|                                                                                     | Total of Item C                                                                                                                                                          |  |       |     |  |  |  |  |  |  |  | - |
|                                                                                     | Total of Item D                                                                                                                                                          |  |       |     |  |  |  |  |  |  |  | - |
|                                                                                     | Total of Item E                                                                                                                                                          |  |       |     |  |  |  |  |  |  |  | - |
|                                                                                     | Total of Item F                                                                                                                                                          |  |       |     |  |  |  |  |  |  |  | - |
|                                                                                     | Total of Item G                                                                                                                                                          |  |       |     |  |  |  |  |  |  |  | - |
| <b>Grand Total of column No. 11 &amp; 12 to be carried forward to Grand summary</b> |                                                                                                                                                                          |  |       |     |  |  |  |  |  |  |  | - |
|                                                                                     |                                                                                                                                                                          |  |       |     |  |  |  |  |  |  |  |   |
| * The Bidder shall specify the type of insulator being offered.                     |                                                                                                                                                                          |  |       |     |  |  |  |  |  |  |  |   |
| Notes:                                                                              |                                                                                                                                                                          |  |       |     |  |  |  |  |  |  |  |   |

- 1 Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types DS1, DA1, DD1, and TDT, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly.
- 2 The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.
- 3 The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.
- 4 The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.
- 5 The bidder shall be responsible to furnish the tower material, OPGW, conductor, insulators, accessories, dampers & hardware for conductor and OPGW, for completion of line in all respect. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.
- 6 The contractor shall transport, unload and stack leftover/additional material from site to NGC designated Warehouse/Store at its own cost.
- 7 Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.
- 8 The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully before filling up the schedule of prices.
- 9 Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.
- 10 Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.
- 11 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.

**Signature of  
Bidder**

| <b>Design, Manufacture, Procurement, Supply, Laying, Installation, Testing &amp; Commissioning of 500 kV Transmission Lines for<br/>C-5 Power Evacuation Scheme<br/>Lot-IV: 500 kV D/C C5-Ludewala —Section B (Approx. 32 km)</b> |                                                                                                                                                                                                                                                                                                                         |      |          |                |           |                 |                             |                |                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------|----------------|-----------|-----------------|-----------------------------|----------------|--------------------------------------|
| <b><u>SCHEDULE NO.2- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM WITHIN PAKISTAN</u></b>                                                                                                                                        |                                                                                                                                                                                                                                                                                                                         |      |          |                |           |                 |                             |                |                                      |
| Item No.                                                                                                                                                                                                                          | Description                                                                                                                                                                                                                                                                                                             | Unit | Quantity | Unit Price     |           | Total EXW Price | Total Inland Transportation | Total Price    | Sales and other Taxes & Duties (PKR) |
|                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                         |      |          | Local Currency | EXW Price |                 |                             | Local Currency |                                      |
| 1                                                                                                                                                                                                                                 | 2                                                                                                                                                                                                                                                                                                                       | 3    | 4        | 5              | 6         | 7 = 4 x 6       | 8                           | 9 = 7+ 8       | 10                                   |
|                                                                                                                                                                                                                                   | <b><u>500kV Double Circuit Transmission Line</u></b>                                                                                                                                                                                                                                                                    |      |          |                |           |                 |                             |                |                                      |
| <b>A</b>                                                                                                                                                                                                                          | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                                              |      |          |                |           |                 |                             |                |                                      |
| 1                                                                                                                                                                                                                                 | Furnish 500 kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |      |          |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                                   | (a) <u>Tower Type "DS1"</u>                                                                                                                                                                                                                                                                                             |      |          |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                                   | (i) Basic Tower Body                                                                                                                                                                                                                                                                                                    | No.  | 80       |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                                   | (ii) 2.0 m Single Leg Extension                                                                                                                                                                                                                                                                                         | No.  | -        |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                                   | (iii) 4.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No.  | 44       |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                                   | (iv) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                                         | No.  | 196      |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                                   | (v) 8.0 m Single Leg Extension                                                                                                                                                                                                                                                                                          | No.  | 80       |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                                   | (vi) 6.0 m Body Extension                                                                                                                                                                                                                                                                                               | No.  | -        |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                                   | (vii) Stubs                                                                                                                                                                                                                                                                                                             | No.  | 320      |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                                   | (b) <u>Tower Type "DA1"</u>                                                                                                                                                                                                                                                                                             |      |          |                |           |                 |                             |                |                                      |

|          |                                                              |                              |     |     |  |  |  |  |  |  |
|----------|--------------------------------------------------------------|------------------------------|-----|-----|--|--|--|--|--|--|
|          | (i)                                                          | Basic Tower Body             | No. | 9   |  |  |  |  |  |  |
|          | (ii)                                                         | 2.0 m Single Leg Extension   | No. | -   |  |  |  |  |  |  |
|          | (iii)                                                        | 4.0 m Single Leg Extension   | No. | -   |  |  |  |  |  |  |
|          | (iv)                                                         | 6.0 m Single Leg Extension   | No. | 28  |  |  |  |  |  |  |
|          | (v)                                                          | 8.0 m Single Leg Extension   | No. | 8   |  |  |  |  |  |  |
|          | (vi)                                                         | 6.0 m Body Extension         | No. | 1   |  |  |  |  |  |  |
|          | (vii)                                                        | Stubs                        | No. | 36  |  |  |  |  |  |  |
|          | (c)                                                          | <u>Tower Type "DD1"</u>      |     |     |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body             | No. | 6   |  |  |  |  |  |  |
|          | (ii)                                                         | 2.0 m Single Leg Extension   | No. | -   |  |  |  |  |  |  |
|          | (iii)                                                        | 4.0 m Single Leg Extension   | No. | -   |  |  |  |  |  |  |
|          | (iv)                                                         | 6.0 m Single Leg Extension   | No. | 20  |  |  |  |  |  |  |
|          | (v)                                                          | 8.0 m Single Leg Extension   | No. | 4   |  |  |  |  |  |  |
|          | (vi)                                                         | 6.0 m Body Extension         | No. | 1   |  |  |  |  |  |  |
|          | (vii)                                                        | Stubs                        | No. | 24  |  |  |  |  |  |  |
|          | (d)                                                          | <u>Tower Type "TDT"</u>      |     |     |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body             | No. | 2   |  |  |  |  |  |  |
|          | (ii)                                                         | 4.0 m Single Leg Extension   | No. | 4   |  |  |  |  |  |  |
|          | (iii)                                                        | 6.0 m Single Leg Extension   | No. | 4   |  |  |  |  |  |  |
|          | (iv)                                                         | Stubs                        | No. | 8   |  |  |  |  |  |  |
|          | <b>Sub-Total A :</b>                                         |                              |     |     |  |  |  |  |  |  |
| <b>B</b> | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                              |     |     |  |  |  |  |  |  |
| 1        | Furnish 795 KCM ACSR "Drake" Conductor                       |                              | km  | 784 |  |  |  |  |  |  |
| 2        | Furnish                                                      |                              |     |     |  |  |  |  |  |  |
|          | (a)                                                          | OPGW with at least 24 fibers | km  | 75  |  |  |  |  |  |  |
|          | (b)                                                          | Joint boxes for OPGW         |     |     |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                          |                                                                      |     |     |  |  |  |  |  |  |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----|-----|--|--|--|--|--|--|
|          | (i)                                                                                                                                                                                                                                                      | OPGW-OPGW (A Type)                                                   | No. | 15  |  |  |  |  |  |  |
|          | (ii)                                                                                                                                                                                                                                                     | OPGW-OPGW Cable ( B Type)                                            | No. | -   |  |  |  |  |  |  |
|          | (iii)                                                                                                                                                                                                                                                    | OPGW-attaching Clamps                                                | No. | 900 |  |  |  |  |  |  |
|          | (iv)                                                                                                                                                                                                                                                     | Fibre Optic Approach Cable                                           | km  | -   |  |  |  |  |  |  |
|          | (c)                                                                                                                                                                                                                                                      | Test Equipment, Installation and Maintenance Tools                   |     | -   |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                        | Fiber Optic Talk Set (Set comprised two units)                       | Set | 1   |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                        | Fiber Optic Tool Kit                                                 | Set | 1   |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                        | OTDR with range $\geq 400\text{km}$<br>Yokogawa AQ7260 or equivalent | Set | 1   |  |  |  |  |  |  |
|          | <b>Sub Total B :</b>                                                                                                                                                                                                                                     |                                                                      |     |     |  |  |  |  |  |  |
| <b>C</b> | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                             |                                                                      |     |     |  |  |  |  |  |  |
| 1        | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001        |                                                                      | Set | 480 |  |  |  |  |  |  |
| 2        | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002 |                                                                      | Set | 90  |  |  |  |  |  |  |
| 3        | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per                                         |                                                                      | Set | 180 |  |  |  |  |  |  |

|   | specification drawing No.<br>4029/169/401C/TD/01E005                                                                                                                                                                                                                                                                                 |     |    |  |  |  |  |  |  |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|--|--|--|--|--|--|
| 4 | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower type 'TDT' including Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing (Note: No. of Insulators in each arm/string = 29 Nos.) as per specification drawing No. 4029/169/401C/TD/01E005a | Set | 16 |  |  |  |  |  |  |
| 5 | Furnish Single string Transposition Assembly Upright type "TDTU(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E006 (Note: No. of Insulators in each arm/string = 36 Nos.)            | Set | 8  |  |  |  |  |  |  |
| 6 | Furnish Single string Transposition Assembly Inverted type "TDTI(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E007 (Note: No. of Insulators in each arm/string = 36 Nos.)           | Set | 8  |  |  |  |  |  |  |
| 7 | Furnish Quad string special dead end assemblies type "SDE(4)" for Pre-RTV Coated 160kN E&M strength insulators for tower type "TDT" as per specification drawing No. 4029/169/401C/TD/01E008 (Note: No. of Insulators in each arm/string = 29 Nos.)                                                                                  | Set | 8  |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                                                      |         |     |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|--|--|--|--|--|--|
| 8        | Furnish Pipe Jumper Assembly type "VJT(4)" for Pre-RTV Coated 80kN E&M strength insulators for tower type "TDT" including jumper spacers & special jumper spacers as per specification drawing No. 4029/169/401C/TD/01E009<br>(Note: No. of Insulators in each arm/string = 54 Nos.) | Set     | 8   |  |  |  |  |  |  |
| 9        | Furnish Special Tension Clamp for tower type "TDT" as per specification                                                                                                                                                                                                              | Set     | 32  |  |  |  |  |  |  |
| 10       | Furnish Jumper Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                                                                  | Set     | 128 |  |  |  |  |  |  |
| 11       | Furnish Straight Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                                                                | Set     | 32  |  |  |  |  |  |  |
| 12       | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                                   | Set     | 6   |  |  |  |  |  |  |
| 13       | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                                  | Set     | 6   |  |  |  |  |  |  |
| 14       | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assemblies (items C1 - 8 & C12-13) with Coulomb or ElecNET software.                                                                                                        | Lumpsum | 1   |  |  |  |  |  |  |
|          | <b>Sub-Total C :</b>                                                                                                                                                                                                                                                                 |         |     |  |  |  |  |  |  |
| <b>D</b> | <b>Hardware for OPGW</b>                                                                                                                                                                                                                                                             |         |     |  |  |  |  |  |  |
| 1        | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower                                                                                                                                                                                                    | Set     | 160 |  |  |  |  |  |  |

|          |                                                                                                                                                                          |     |       |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|--|--|--|--|--|--|
|          | type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                                      |     |       |  |  |  |  |  |  |
| 2        | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                             | Set | 15    |  |  |  |  |  |  |
| 3        | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                | Set | 34    |  |  |  |  |  |  |
|          | <b>Sub-Total D :</b>                                                                                                                                                     |     |       |  |  |  |  |  |  |
| <b>E</b> | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |     |       |  |  |  |  |  |  |
| 1        | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 | No. | 270   |  |  |  |  |  |  |
| 2        | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      | No. | 135   |  |  |  |  |  |  |
| 3        | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No. | 845   |  |  |  |  |  |  |
| 4        | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No. | 3,920 |  |  |  |  |  |  |
| 5        | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor (See Note-3)                                                                                  | No. | 980   |  |  |  |  |  |  |
| 6        | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No. | 463   |  |  |  |  |  |  |
|          | <b>Sub-Total E :</b>                                                                                                                                                     |     |       |  |  |  |  |  |  |
|          |                                                                                                                                                                          |     |       |  |  |  |  |  |  |
| <b>F</b> | <b><u>Grounding Material</u></b>                                                                                                                                         |     |       |  |  |  |  |  |  |
| 1        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            | No. | 194   |  |  |  |  |  |  |
| 2        | Furnish flat to cable connector.                                                                                                                                         | No. | 194   |  |  |  |  |  |  |
| 3        | Furnish cable to rod connector.                                                                                                                                          | No. | 194   |  |  |  |  |  |  |



|          |                                                                                                                                                                                                                                                                                                                        |       |     |  |  |  |  |  |  |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|--|--|--|--|--|--|
| 4        | Furnish 7 No. 10 copper covered ground wire.                                                                                                                                                                                                                                                                           | Meter | 582 |  |  |  |  |  |  |
|          | <b>Sub-Total F :</b>                                                                                                                                                                                                                                                                                                   |       |     |  |  |  |  |  |  |
| <b>G</b> | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                                                                                                                                                                    |       |     |  |  |  |  |  |  |
| <b>1</b> | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                                             |       |     |  |  |  |  |  |  |
|          | Furnish 500kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |       |     |  |  |  |  |  |  |
|          | (a) <u>Tower Type "DS1"</u>                                                                                                                                                                                                                                                                                            |       |     |  |  |  |  |  |  |
|          | (i) Basic Tower Body                                                                                                                                                                                                                                                                                                   | No.   | 8   |  |  |  |  |  |  |
|          | (ii) 2.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No.   | 4   |  |  |  |  |  |  |
|          | (iii) 4.0 m Single Leg Extension                                                                                                                                                                                                                                                                                       | No.   | 8   |  |  |  |  |  |  |
|          | (iv) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No.   | 20  |  |  |  |  |  |  |
|          | (v) 8.0 m Single Leg Extension                                                                                                                                                                                                                                                                                         | No.   | 8   |  |  |  |  |  |  |
|          | (vi) 6.0 m Body Extension                                                                                                                                                                                                                                                                                              | No.   | 1   |  |  |  |  |  |  |
|          | (vii) Stubs                                                                                                                                                                                                                                                                                                            | No.   | 32  |  |  |  |  |  |  |
|          | (b) <u>Tower Type "DA1"</u>                                                                                                                                                                                                                                                                                            |       |     |  |  |  |  |  |  |
|          | (i) Basic Tower Body                                                                                                                                                                                                                                                                                                   | No.   | 3   |  |  |  |  |  |  |
|          | (ii) 2.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No.   | 4   |  |  |  |  |  |  |
|          | (iii) 4.0 m Single Leg Extension                                                                                                                                                                                                                                                                                       | No.   | -   |  |  |  |  |  |  |
|          | (iv) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No.   | 4   |  |  |  |  |  |  |
|          | (v) 8.0 m Single Leg Extension                                                                                                                                                                                                                                                                                         | No.   | 4   |  |  |  |  |  |  |
|          | (vi) 6.0 m Body Extension                                                                                                                                                                                                                                                                                              | No.   | 1   |  |  |  |  |  |  |
|          | (vii) Stubs                                                                                                                                                                                                                                                                                                            | No.   | 12  |  |  |  |  |  |  |
|          | (c) <u>Tower Type "DD1"</u>                                                                                                                                                                                                                                                                                            |       |     |  |  |  |  |  |  |
|          | (i) Basic Tower Body                                                                                                                                                                                                                                                                                                   | No.   | 3   |  |  |  |  |  |  |
|          | (ii) 2.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No.   | 4   |  |  |  |  |  |  |

|     |                                                                                                                                                                                                                                                   |                              |     |       |  |  |  |  |  |  |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----|-------|--|--|--|--|--|--|
|     | (iii)                                                                                                                                                                                                                                             | 4.0 m Single Leg Extension   | No. | -     |  |  |  |  |  |  |
|     | (iv)                                                                                                                                                                                                                                              | 6.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |
|     | (v)                                                                                                                                                                                                                                               | 8.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |
|     | (vi)                                                                                                                                                                                                                                              | 6.0 m Body Extension         | No. | 1     |  |  |  |  |  |  |
|     | (vii)                                                                                                                                                                                                                                             | Stubs                        | No. | 12    |  |  |  |  |  |  |
| (d) | <u>Tower Type "TDT"</u>                                                                                                                                                                                                                           |                              |     |       |  |  |  |  |  |  |
|     | (i)                                                                                                                                                                                                                                               | Basic Tower Body             | No. | -     |  |  |  |  |  |  |
|     | (ii)                                                                                                                                                                                                                                              | 6.0 m Single Leg Extension   | No. | -     |  |  |  |  |  |  |
|     | (iii)                                                                                                                                                                                                                                             | Stubs                        | No. | -     |  |  |  |  |  |  |
|     | <b><u>Conductor and OPGW (With Associated Equipment)</u></b>                                                                                                                                                                                      |                              |     |       |  |  |  |  |  |  |
| 2   | Furnish 795 KCM ACSR "Drake" Conductor                                                                                                                                                                                                            |                              | km  | 76.80 |  |  |  |  |  |  |
| 3   | Furnish                                                                                                                                                                                                                                           |                              |     |       |  |  |  |  |  |  |
|     | (a)                                                                                                                                                                                                                                               | OPGW with at least 24 fibers | km  | 10    |  |  |  |  |  |  |
|     | (b)                                                                                                                                                                                                                                               | Joint boxes for OPGW         |     |       |  |  |  |  |  |  |
|     | (i)                                                                                                                                                                                                                                               | OPGW-OPGW (A Type)           | No. | 2     |  |  |  |  |  |  |
|     | (ii)                                                                                                                                                                                                                                              | OPGW-OPGW Cable ( B Type)    | No. | -     |  |  |  |  |  |  |
|     | (iii)                                                                                                                                                                                                                                             | OPGW-attaching Clamps        | No. | 120   |  |  |  |  |  |  |
|     | (iv)                                                                                                                                                                                                                                              | Fibre Optic Approach Cable   | km  | -     |  |  |  |  |  |  |
|     | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                      |                              |     |       |  |  |  |  |  |  |
| 4   | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001 |                              | Set | 48    |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                                                    |     |    |  |  |  |  |  |  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|--|--|--|--|--|--|
| 5  | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002           | Set | 36 |  |  |  |  |  |  |
| 6  | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005 | Set | 72 |  |  |  |  |  |  |
| 7  | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                 | Set | 6  |  |  |  |  |  |  |
| 8  | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                | Set | 6  |  |  |  |  |  |  |
|    | <b>Hardware for OPGW</b>                                                                                                                                                                                                                                           |     |    |  |  |  |  |  |  |
| 9  | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                                              | Set | 16 |  |  |  |  |  |  |
| 10 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                                                                                                                       | Set | 2  |  |  |  |  |  |  |
| 11 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                                                                                                          | Set | 12 |  |  |  |  |  |  |

|    |                                                                                                                                                                          |       |     |  |  |  |  |  |   |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|--|--|--|--|--|---|
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |       |     |  |  |  |  |  |   |
| 12 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 | No.   | 26  |  |  |  |  |  |   |
| 13 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      | No.   | 13  |  |  |  |  |  |   |
| 14 | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No.   | 370 |  |  |  |  |  |   |
| 15 | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No.   | 655 |  |  |  |  |  |   |
| 16 | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor                                                                                               | No.   | 164 |  |  |  |  |  |   |
| 17 | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No.   | 82  |  |  |  |  |  |   |
|    | <b><u>Grounding Material</u></b>                                                                                                                                         |       |     |  |  |  |  |  |   |
| 18 | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            | No.   | 28  |  |  |  |  |  |   |
| 19 | Furnish flat to cable connector.                                                                                                                                         | No.   | 28  |  |  |  |  |  |   |
| 20 | Furnish cable to rod connector.                                                                                                                                          | No.   | 28  |  |  |  |  |  |   |
| 21 | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             | Meter | 84  |  |  |  |  |  |   |
|    | <b>Sub-Total of G :</b>                                                                                                                                                  |       |     |  |  |  |  |  | - |
|    | Total of Item A                                                                                                                                                          |       |     |  |  |  |  |  | - |
|    | Total of Item B                                                                                                                                                          |       |     |  |  |  |  |  | - |
|    | Total of Item C                                                                                                                                                          |       |     |  |  |  |  |  | - |
|    | Total of Item D                                                                                                                                                          |       |     |  |  |  |  |  | - |
|    | Total of Item E                                                                                                                                                          |       |     |  |  |  |  |  | - |
|    | Total of Item F                                                                                                                                                          |       |     |  |  |  |  |  | - |

|                                                           |  |  |  |  |  |   |
|-----------------------------------------------------------|--|--|--|--|--|---|
| Total of Item G                                           |  |  |  |  |  | - |
| <b>Total of Column 9 to be forwarded to Grand Summary</b> |  |  |  |  |  | - |
|                                                           |  |  |  |  |  |   |

- \* The Bidder shall specify the type of insulator being offered.

**Notes:**

- 1 Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types DS1, DA1, DD1, and TDT, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly.
- 2 The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.
- 3 The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.
- 4 The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.
- 5 The bidder shall be responsible to furnish the tower material, OPGW, conductor, insulators, accessories, dampers & hardware for conductor and OPGW, for completion of line in all respect. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.
- 6 The contractor shall transport, unload and stack leftover/additional material from site to NGC designated Warehouse/Store at its own cost.
- 7 Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.
- 8 The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully before filling up the schedule of prices.
- 9 Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.
- 10 Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.
- 11 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.

**Signature of Bidder**

---

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-IV: 500 kV D/C C5-Ludewala – Section B (Approx. 32 km)**

**Schedule No.3 - Design Services**

| Item                                                  | Description | Qty. | Unit Price <sup>1</sup><br>Local<br>Currency | Total Price | Total<br>Provincial<br>Sales Tax |
|-------------------------------------------------------|-------------|------|----------------------------------------------|-------------|----------------------------------|
| 1                                                     | 2           | 3    | 4                                            | 5 = 3 x 4   | 6                                |
| 1                                                     |             | Lot  |                                              |             |                                  |
| NOT APPLICABLE                                        |             |      |                                              |             |                                  |
| 2                                                     |             | Lot  |                                              |             |                                  |
| 3                                                     |             | Lot  |                                              |             |                                  |
| TOTAL Column 5 to be carried forward to Grand Summary |             |      |                                              |             |                                  |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>1</sup>Specify currency in accordance ITB 12.

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme  
Lot-IV: 500 kV D/C C5-Ludewala —Section B (Approx. 32 km)**

**SCHEDULE NO.4 - INSTALLATION AND OTHER SERVICES**

**(INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)**

| Item No.                                                                                  | Description                 | Unit     | Qty | Unit Price (PKR) | Total Price (PKR) Including all Custom duties, taxes and other levies etc. w/o Provincial Sales Tax | Total Provincial Sales tax (PST) in PKR |
|-------------------------------------------------------------------------------------------|-----------------------------|----------|-----|------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------|
| 1                                                                                         | 2                           | 3        | 4   | 5                | 6=4*5                                                                                               | 7                                       |
| <b>INSTALLATION (INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)</b> |                             |          |     |                  |                                                                                                     |                                         |
| A                                                                                         | <u>Survey</u>               |          |     |                  |                                                                                                     |                                         |
| 1                                                                                         | Clearing Right of Way (ROW) | Lump Sum | 1   |                  |                                                                                                     |                                         |



|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |     |  |  |   |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----|--|--|---|
| 2        | Validation of already established centre line prior to foundation construction and preparation of as-built plan & profile drawings of the already prepared plan & profile drawings using PLS-CADD and construction structure lists (to be provided to the Contractor after award of contract) of the constructed transmission line after incorporating all the changes and submitted to the Project Manager. In case of route diversion, payment of the diverted portion will be made as per item A.3 | km        | 32  |  |  |   |
| 3        | Route alignment and detailed surveying of diverted portion not limited to chainage and leveling, preparation of plan & profile drawings, spotting of towers and preparation of construction structure list & Latitude & Longitude with hand held GPS of each tower location                                                                                                                                                                                                                           | km        | 3.2 |  |  |   |
|          | <b>Sub-Total A:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |     |  |  | - |
| <b>B</b> | <b><u>Sub-soil Investigations:</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |     |  |  |   |
|          | Sub-Soil Investigation for T/Line at (ii) and confirmatory sub-soil Investigation in varied soil/boulder/rock (including laboratory tests) as per Specifications (Technical Provisions for Construction Clause 10.2) and submission of Sub-Soil Investigation Report.                                                                                                                                                                                                                                 |           |     |  |  |   |
| (a)      | From NSL to depth of 15 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Lin. Mtr. | 45  |  |  |   |
| (b)      | From 15 m to depth of 25 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Lin. Mtr. | 10  |  |  |   |
| (c)      | Hand Auger upto depth of 10m                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Lin. Mtr. | 30  |  |  |   |
|          | <b>Sub-Total B:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |     |  |  |   |
| <b>C</b> | <b><u>Foundations</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |     |  |  |   |

|          |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |   |  |  |  |
|----------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---|--|--|--|
|          |                                | Reinforced Concrete Spread Foundations (4 legs) complete in all respect in varied soil as well as boulders/rock complete with supply of materials including alignment, peg marking, access, preparatory works, excavation, blasting, leveling, grading of tower site, cutting, dewatering, shuttering, reinforcement, concreting (using Sulphate Resistance Cement conforming to ASTM C-150 Type-V), lean concrete (if required), curing, backfilling of foundations after concreting with excavated/borrowed earth (irrespective of lead), application of three (03) coats hot bitumen (ExpanProof* 10 – Fospak bitumen and compaction of backfill material in layers, stub setting and site restoration etc. including tower staking (Latitude & Longitude with hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type as per drawings and specifications: |            |   |  |  |  |
|          | (a)                            | DS1 (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G010                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |   |  |  |  |
|          | (i)                            | Foundation Type D1 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 5 |  |  |  |
|          | (ii)                           | Foundation Type D2 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 8 |  |  |  |
|          | (iii)                          | Foundation Type S (Semi-Submerged)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Foundation | 3 |  |  |  |
|          | (iv)                           | Foundation Type W (Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Foundation | 0 |  |  |  |
|          | (v)                            | Foundation Type W1 (Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Foundation | 0 |  |  |  |
|          | (b)                            | DA1 (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |   |  |  |  |
|          | (i)                            | Foundation Type D1 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 1 |  |  |  |
|          | (ii)                           | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Foundation | 0 |  |  |  |
|          | (iii)                          | Foundation Type W (Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Foundation | 0 |  |  |  |
|          | <b>Sub-Total C:</b>            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |   |  |  |  |
| <b>D</b> | <b><u>Pile Foundations</u></b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |   |  |  |  |

|  |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |           |  |  |  |
|--|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|--|--|--|
|  | D-1   | Reinforced concrete pile foundations (cast in situ installation) complete in all type of soil as well as boulders/gravels/rock with supply of materials including excavation, drilling/boring, shuttering, reinforcement, concreting, bitumen coating, backfilling, installation of Stubs, tower grounding, site clearing etc. using Sulphate Resistance Cement conforming to ASTM C-150 Type-V shall be used including tower staking (Latitude & Longitude with RTK/hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type: |            |           |  |  |  |
|  | (a)   | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DS1, and drawing No. <b>4029/169/TLC-22/TD/01G014</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Foundation | <b>63</b> |  |  |  |
|  | (b)   | Reinforced concrete single pile per footing 900 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G014</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |           |  |  |  |
|  | (i)   | Pile shaft upto depth of 15 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Lin.mtr    | 3780      |  |  |  |
|  | (ii)  | Pile shaft depth 15 - 20 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lin.mtr    | 360       |  |  |  |
|  | (iii) | Pile shaft depth 20 - 25 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lin.mtr    | 20        |  |  |  |
|  | (c)   | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DA1, and drawing No. <b>4029/169/TLC-22/TD/01G015</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Foundation | <b>6</b>  |  |  |  |
|  | (d)   | Reinforced concrete single pile per footing 1200 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G015</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |           |  |  |  |
|  | (i)   | Pile shaft upto depth of 15 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Lin.mtr    | 360       |  |  |  |
|  | (ii)  | Pile shaft depth 15 - 20 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lin.mtr    | 120       |  |  |  |
|  | (iii) | Pile shaft depth 20 - 25 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lin.mtr    | 60        |  |  |  |
|  | (e)   | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DD1/DT1, and drawing No. <b>4029/169/TLC-22/TD/01G016</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Foundation | <b>4</b>  |  |  |  |

|  |       |                                                                                                                                                           |            |     |  |  |  |
|--|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|--|--|--|
|  | (f)   | Reinforced concrete single pile per footing 1500 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G016</b> (including steel liner/casing), if required. |            |     |  |  |  |
|  | (i)   | Pile shaft upto depth of 20 m                                                                                                                             | Lin.mtr    | 320 |  |  |  |
|  | (ii)  | Pile shaft depth 20 - 25 m                                                                                                                                | Lin.mtr    | 40  |  |  |  |
|  | (iii) | Pile shaft depth 25 - 30 m                                                                                                                                | Lin.mtr    | 20  |  |  |  |
|  | (g)   | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, TDT, and drawing No. NPP-03C-2019/K2K3PQMTL/ICC/012                  | Foundation | 1   |  |  |  |
|  | (h)   | Reinforced concrete single pile per footing 1500 mm dia. as per drawing No. NPP-03C-2019/K2K3PQMTL/ICC/012 (including steel liner/casing), if required.   |            |     |  |  |  |
|  | (i)   | Pile shaft upto depth of 20 m                                                                                                                             | Lin.mtr    | 80  |  |  |  |
|  | (ii)  | Pile shaft depth 20 - 25 m                                                                                                                                | Lin.mtr    | 20  |  |  |  |
|  | (iii) | Pile shaft depth 25 - 30 m                                                                                                                                | Lin.mtr    | 20  |  |  |  |
|  | D-2   | Pile load test in compression confirming to ASTM D1143 / D1143M and in uplift confirming to ASTM D3689 / D3689M at 2.5 times of tower foundation loads    |            |     |  |  |  |
|  | (i)   | DS1 (In Compression)                                                                                                                                      | Pile       | 1   |  |  |  |
|  | (ii)  | DS1 (In Tension/Uplift)                                                                                                                                   | Pile       | 1   |  |  |  |
|  | (iii) | Reinforced concrete single Test pile per footing 1500 mm dia. as per drawing No. 4029/169/TLC-22/TD/01G016 (including steel liner/casing), if required.   |            | 2   |  |  |  |
|  | (a)   | Pile shaft upto depth of 20 m                                                                                                                             | Lin.mtr    | 40  |  |  |  |

|          |                                                                                                                                                                                                                                                                                 |                                                                  |                    |       |  |  |  |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------|-------|--|--|--|
|          | (b)                                                                                                                                                                                                                                                                             | Pile shaft depth 20 - 25 m                                       | Lin.mtr            | 10    |  |  |  |
|          | (c)                                                                                                                                                                                                                                                                             | Pile shaft depth 25 - 30 m                                       | Lin.mtr            | 10    |  |  |  |
|          | D-3                                                                                                                                                                                                                                                                             | Sonic Integrity Test at pile foundation confirming to ASTM D5882 | No.                | 40    |  |  |  |
|          | <b>Sub-Total D:</b>                                                                                                                                                                                                                                                             |                                                                  |                    |       |  |  |  |
| <b>E</b> | <b><u>Erection of Steel Towers</u></b>                                                                                                                                                                                                                                          |                                                                  |                    |       |  |  |  |
| 1        | Transport and Install 500kV double circuit tower types 'DS1', 'DA1', 'DD1' & TDT with all accessories i.e anti climbing devices, aerial markers number plates, danger signs, phase plates, Bird Guards etc. in accordance with requirements of Bidding Documents                |                                                                  | Ton                | 2,948 |  |  |  |
| 2        | Welding of erected tower bolts & nuts after final inspection upto height of 8.0 m from top of foundation chimney as per specification drawing                                                                                                                                   |                                                                  | Each tower         | 97    |  |  |  |
|          | <b>Sub-Total E:</b>                                                                                                                                                                                                                                                             |                                                                  |                    |       |  |  |  |
| <b>F</b> | <b><u>Stringing of Conductor and OPGW</u></b>                                                                                                                                                                                                                                   |                                                                  |                    |       |  |  |  |
| 1        | Transport & Install 795KCM ACSR Drake for quad conductor configuration insulator hanging, hardware assemblies, accessories & dampers etc. complete in all respects as per specifications & approved drawings and methodology.                                                   |                                                                  | km D/C Quad Bundle | 32    |  |  |  |
| 2        | Transport & Install OPGW including installation of drop down lengths for joint boxes at the towers along with allied hardware material including hardware assemblies, joint boxes accessories, dampers etc. complete in all respects as per specifications & approved drawings. |                                                                  | km (on Both Peaks) | 32    |  |  |  |
|          | <b>Sub-Total F:</b>                                                                                                                                                                                                                                                             |                                                                  |                    |       |  |  |  |
| <b>G</b> | <b><u>Testing &amp; Commissioning</u></b>                                                                                                                                                                                                                                       |                                                                  |                    |       |  |  |  |
| 1        | Testing and commissioning of the line                                                                                                                                                                                                                                           |                                                                  | Lumpsum            | 1     |  |  |  |
|          | <b>Sub-Total G:</b>                                                                                                                                                                                                                                                             |                                                                  |                    |       |  |  |  |

|          |                                                                                                                                      |        |      |  |  |   |
|----------|--------------------------------------------------------------------------------------------------------------------------------------|--------|------|--|--|---|
| <b>H</b> | <b><u>ENVIRONMENTAL AND SOCIAL SAFEGUARDS</u></b>                                                                                    |        |      |  |  |   |
| 1        | Tree Plantation (Minimum height 4 feet)                                                                                              | No.    | 3000 |  |  |   |
| 2        | Water quality monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route. | No.    | 28   |  |  |   |
| 3        | Ambient Air monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route.   | No.    | 28   |  |  |   |
| 4        | Noise monitoring / analysis / measurement on quarterly basis for the whole project period at three locations along the TL route.     | No.    | 28   |  |  |   |
|          | <b>Sub-Total H:</b>                                                                                                                  |        |      |  |  | - |
| <b>I</b> | <b><u>INSTALLATION SERVICES FOR ADDITIONAL WORK</u></b>                                                                              |        |      |  |  |   |
| 1        | Grading/Cutting/Excavation (Dry Soil)                                                                                                | Cu. m. | 50   |  |  |   |
| 2        | Excavation (semi-submerged soil)                                                                                                     | Cu. m. | 35   |  |  |   |
| 3        | Excavation (submerged soil)                                                                                                          | Cu. m. | 40   |  |  |   |
| 4        | Blasting/Cutting/Excavation/Grading (boulder/Rock)                                                                                   | Cu. m. | 50   |  |  |   |
| 5        | Concrete (3000 psi at 28 days) furnished and installed                                                                               | Cu. m. | 100  |  |  |   |
| 6        | Concrete (4000 psi at 28 days) furnished and installed                                                                               | Cu. m. | 25   |  |  |   |
| 7        | Reinforcing Bars furnished and installed (Grade-60)                                                                                  | kg     | 1000 |  |  |   |
| 8        | Overhaul from Borrow and Compaction (regardless of the distance for borrow)                                                          | Cu. m. | 100  |  |  |   |
| 9        | Lean concrete furnished and installed (2000 psi strength at 28 days)                                                                 | Cu. m. | 70   |  |  |   |
| 10       | Compacted crush+sand (50:50 ratio) installed under footings                                                                          | Cu. m. | 50   |  |  |   |
| 11       | Bitumen coating for footing                                                                                                          | Sq. m  | 50   |  |  |   |
| 12       | Compacted Backfill                                                                                                                   | Cu. m. | 100  |  |  |   |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                        |  |  |  |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--|--|--|--|--|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Sub-Total I:</b>    |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item A</b> |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item B</b> |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item C</b> |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item D</b> |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item E</b> |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item F</b> |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item G</b> |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item H</b> |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item I</b> |  |  |  |  |  |
| <b>Total (Column 6) to be carried forward to Grand Summary</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        |  |  |  |  |  |
| <p><b><u>Notes:</u></b></p> <ol style="list-style-type: none"> <li>1 The quantities mentioned in the BOQ are estimated quantities. These quantities are to be used for bid evaluation purpose only. The actual quantities may vary depending upon detailed engineering and approved drawings. However, the unit rates for material and service quoted in the BOQ/ bid shall remain firm and final if design is unchanged.</li> <li>2 Price of any other item specifically not covered in the Price Schedules but is required for the completion, commissioning and operation of the transmission line shall be deemed to be included in the Price Schedules.</li> <li>3 In case of failure by the bidder to fill the price of Sales Tax in relevant column, the quoted price of the bidder will be considered inclusive of Sales Tax applicable as per Lax and relevant provisions of the Bidding Documents. In case the bidder takes deviation or mention that prices are exclusive of PST, his bid shall be considered as non-responsive.</li> <li>4 Foundation means four legs of tower.</li> <li>5 An allowance of two percent (2%) of the total installed quantity will be permitted for sag, jumpers and wastage for the conductor, one percent (1%) for OPGW and two percent (2%) for lossage of nuts, bolts and washers (for towers only); and one percent (1%) for insulator breakage. These allowances are the maximum permissible and in case of wastage less than these limits all excess material shall be returned to NGC storage yards by the Contractor. For quantities in excess of these limits, the Contractor shall replace or reimburse NGC for the loss. All unused, above allowable limits of waste materials and packing wood are the property of NGC and shall be returned to NGC storage yards by the Contractor.</li> </ol> |                        |  |  |  |  |  |

- 6 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.
- 7 The Bidder shall quote prices against all items, including those for which the specified quantity is "0". No item shall be left blank or unpriced in the Price Schedule.
- 8 Pile Foundation design will be release after the submission of Pile load test Report.
- 9 Location for Sonic Integrity and sonic integrity test report approval will be accorded by the office of DG (C&SE) NGC.

**Name of  
Bidder**

**Signature  
of Bidder**



**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme**  
**Lot-IV: 500 kV D/C C5-Ludewala —Section B (Approx. 32 km)**

**SCHEDULE NO. 5 - GRAND SUMMARY**

| Sr. No.                                                         | Description                                                                                      | Bid Prices                 |                                |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------|--------------------------------|
|                                                                 |                                                                                                  | Foreign Currency Component | Local Currency Component (PKR) |
| 1                                                               | Total Schedule No. 1 Plant and Mandatory Spare Parts Supplied from Abroad                        |                            |                                |
| 2                                                               | Total Schedule No. 2 Plant and Mandatory Spare Parts Supplied from Within the Employer's Country |                            |                                |
| 3                                                               | Total Schedule No. 3 Design Services                                                             |                            |                                |
| 4                                                               | Total Schedule No. 4 Installation and Other Services                                             |                            |                                |
| 5                                                               | Provisional Sum                                                                                  |                            | 1,700 Million                  |
| <b>GRAND TOTAL to be carried forward to Letter of Price Bid</b> |                                                                                                  |                            |                                |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

- 1 Specify the currency in accordance with ITB 12 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-IV: 500 kV D/C C5-Ludewala – Section B (Approx. 32 km)**

**Schedule No. 6 - Recommended Spare Parts**

| Item | Description    | Qty | Unit Price                           |                                           | Total Price                  |                                |
|------|----------------|-----|--------------------------------------|-------------------------------------------|------------------------------|--------------------------------|
|      |                |     | EXW<br>Local Parts<br>Local Currency | CIP<br>Imported Parts<br>Foreign Currency | Local<br>Currency<br>Portion | Foreign<br>Currency<br>Portion |
| 1    | 2              | 3   | 4                                    | 5                                         | 6 = 3 x 4                    | 7 = 3 x 5                      |
|      | NOT APPLICABLE |     |                                      |                                           |                              |                                |
|      |                |     |                                      |                                           |                              |                                |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

# **Schedules of Rates and Prices**

## **(LOT-V)**

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme**  
**Lot-V: 500 kV D/C C5-Ludewala —Section C (Approx. 29 km)**

**SCHEDULE NO.1- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM ABROAD**

| Item No. | Description                                                                                                                                                                                                                                                                                                             | Code Country of Origin | Unit | Quantity | Unit Price (CIF Pakistan Seaport) |           | Total Price (CIF Pakistan Seaport) |           | Total Inland Transportation | Total Price CIP (Project Site) |         | Taxes & Duties |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------|----------|-----------------------------------|-----------|------------------------------------|-----------|-----------------------------|--------------------------------|---------|----------------|
|          |                                                                                                                                                                                                                                                                                                                         |                        |      |          | CFR                               | Insurance | CFR                                | Insurance |                             | FCC                            | LCC     | Local Currency |
| 1        | 2                                                                                                                                                                                                                                                                                                                       | 3                      | 4    | 5        | 6                                 | 7         | 8=5 x 6                            | 9 = 5 x 7 | 10                          | 11=8                           | 12=9+10 | 13             |
|          | <b><u>500kV Double Circuit Transmission Line</u></b>                                                                                                                                                                                                                                                                    |                        |      |          |                                   |           |                                    |           |                             |                                |         |                |
| <b>A</b> | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                                              |                        |      |          |                                   |           |                                    |           |                             |                                |         |                |
| 1        | Furnish 500 kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                        |      |          |                                   |           |                                    |           |                             |                                |         |                |
|          | (a) <u>Tower Type "DS1"</u>                                                                                                                                                                                                                                                                                             |                        |      |          |                                   |           |                                    |           |                             |                                |         |                |
|          | (i) Basic Tower Body                                                                                                                                                                                                                                                                                                    |                        | No.  | 67       |                                   |           |                                    |           |                             |                                |         |                |
|          | (ii) 2.0 m Single Leg Extension                                                                                                                                                                                                                                                                                         |                        | No.  | -        |                                   |           |                                    |           |                             |                                |         |                |
|          | (iii) 4.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        |                        | No.  | 56       |                                   |           |                                    |           |                             |                                |         |                |
|          | (iv) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                                         |                        | No.  | 76       |                                   |           |                                    |           |                             |                                |         |                |
|          | (v) 8.0 m Single Leg Extension                                                                                                                                                                                                                                                                                          |                        | No.  | 140      |                                   |           |                                    |           |                             |                                |         |                |
|          | (vi) 6.0 m Body Extension                                                                                                                                                                                                                                                                                               |                        | No.  | 7        |                                   |           |                                    |           |                             |                                |         |                |
|          | (vii) Stubs                                                                                                                                                                                                                                                                                                             |                        | No.  | 268      |                                   |           |                                    |           |                             |                                |         |                |
|          | (b) <u>Tower Type "DA1"</u>                                                                                                                                                                                                                                                                                             |                        |      |          |                                   |           |                                    |           |                             |                                |         |                |

|          |                                                              |                              |     |        |  |  |  |  |  |  |  |  |  |
|----------|--------------------------------------------------------------|------------------------------|-----|--------|--|--|--|--|--|--|--|--|--|
|          | (i)                                                          | Basic Tower Body             | No. | 12     |  |  |  |  |  |  |  |  |  |
|          | (ii)                                                         | 2.0 m Single Leg Extension   | No. | -      |  |  |  |  |  |  |  |  |  |
|          | (iii)                                                        | 4.0 m Single Leg Extension   | No. | 12     |  |  |  |  |  |  |  |  |  |
|          | (iv)                                                         | 6.0 m Single Leg Extension   | No. | 12     |  |  |  |  |  |  |  |  |  |
|          | (v)                                                          | 8.0 m Single Leg Extension   | No. | 24     |  |  |  |  |  |  |  |  |  |
|          | (vi)                                                         | 6.0 m Body Extension         | No. | 3      |  |  |  |  |  |  |  |  |  |
|          | (vii)                                                        | Stubs                        | No. | 48     |  |  |  |  |  |  |  |  |  |
|          | (c)                                                          | <u>Tower Type "DD1"</u>      |     |        |  |  |  |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body             | No. | 9      |  |  |  |  |  |  |  |  |  |
|          | (ii)                                                         | 2.0 m Single Leg Extension   | No. | -      |  |  |  |  |  |  |  |  |  |
|          | (iii)                                                        | 4.0 m Single Leg Extension   | No. | 4      |  |  |  |  |  |  |  |  |  |
|          | (iv)                                                         | 6.0 m Single Leg Extension   | No. | 12     |  |  |  |  |  |  |  |  |  |
|          | (v)                                                          | 8.0 m Single Leg Extension   | No. | 20     |  |  |  |  |  |  |  |  |  |
|          | (vi)                                                         | 6.0 m Body Extension         | No. | 2      |  |  |  |  |  |  |  |  |  |
|          | (vii)                                                        | Stubs                        | No. | 36     |  |  |  |  |  |  |  |  |  |
|          | (d)                                                          | <u>Tower Type "TDT"</u>      |     |        |  |  |  |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body             | No. | 1      |  |  |  |  |  |  |  |  |  |
|          | (ii)                                                         | 8.0 m Single Leg Extension   | No. | 4      |  |  |  |  |  |  |  |  |  |
|          | (iii)                                                        | Stubs                        | No. | 4      |  |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total A :</b>                                         |                              |     |        |  |  |  |  |  |  |  |  |  |
| <b>B</b> | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                              |     |        |  |  |  |  |  |  |  |  |  |
| 1        | Furnish 795 KCM ACSR "Drake" Conductor                       |                              | km  | 710.40 |  |  |  |  |  |  |  |  |  |
| 2        | Furnish                                                      |                              |     |        |  |  |  |  |  |  |  |  |  |
|          | (a)                                                          | OPGW with at least 24 fibers | km  | 70     |  |  |  |  |  |  |  |  |  |
|          | (b)                                                          | Joint boxes for OPGW         |     |        |  |  |  |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                                    |                                                    |                                                            |     |     |  |  |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------|-----|-----|--|--|--|--|--|--|--|--|
|          |                                                                                                                                                                                                                                                                    | (i)                                                | OPGW-OPGW (A Type)                                         | No. | 14  |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                    | (ii)                                               | OPGW-OPGW Cable ( B Type)                                  | No. | -   |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                    | (iii)                                              | OPGW-attaching Clamps                                      | No. | 840 |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                    | (iv)                                               | Fibre Optic Approach Cable                                 | km  | -   |  |  |  |  |  |  |  |  |
|          | (c)                                                                                                                                                                                                                                                                | Test Equipment, Installation and Maintenance Tools |                                                            |     | -   |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                    | -                                                  | Fiber Optic Talk Set (Set comprised two units)             | Set | 1   |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                    | -                                                  | Fiber Optic Tool Kit                                       | Set | 1   |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                    | -                                                  | OTDR with range $\geq$ 400km Yokogawa AQ7260 or equivalent | Set | 1   |  |  |  |  |  |  |  |  |
|          | <b>Sub Total B :</b>                                                                                                                                                                                                                                               |                                                    |                                                            |     |     |  |  |  |  |  |  |  |  |
| <b>C</b> | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                                       |                                                    |                                                            |     |     |  |  |  |  |  |  |  |  |
| 1        | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001                  |                                                    |                                                            | Set | 402 |  |  |  |  |  |  |  |  |
| 2        | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002           |                                                    |                                                            | Set | 126 |  |  |  |  |  |  |  |  |
| 3        | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005 |                                                    |                                                            | Set | 252 |  |  |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                                                                                                         |  |     |    |  |  |  |  |  |  |  |  |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|----|--|--|--|--|--|--|--|--|
| 4 | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower type 'TDT' including Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing<br>(Note: No. of Insulators in each arm/string = 29 Nos.) as per specification drawing No. 4029/169/401C/TD/01E005a |  | Set | 8  |  |  |  |  |  |  |  |  |
| 5 | Furnish Single string Transposition Assembly Upright type "TDTU(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E006<br>(Note: No. of Insulators in each arm/string = 36 Nos.)            |  | Set | 4  |  |  |  |  |  |  |  |  |
| 6 | Furnish Single string Transposition Assembly Inverted type "TDTI(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E007<br>(Note: No. of Insulators in each arm/string = 36 Nos.)           |  | Set | 4  |  |  |  |  |  |  |  |  |
| 7 | Furnish Quad string special dead end assemblies type "SDE(4)" for Pre-RTV Coated 160kN E&M strength insulators for tower type "TDT" as per specification drawing No. 4029/169/401C/TD/01E008<br>(Note: No. of Insulators in each arm/string = 29 Nos.)                                                                                  |  | Set | 4  |  |  |  |  |  |  |  |  |
| 8 | Furnish Pipe Jumper Assembly type "VJT(4)" for Pre-RTV Coated 80kN E&M strength insulators for tower type "TDT" including jumper spacers & special jumper spacers as per specification drawing No. 4029/169/401C/TD/01E009<br>(Note: No. of Insulators in each arm/string = 54 Nos.)                                                    |  | Set | 4  |  |  |  |  |  |  |  |  |
| 9 | Furnish Special Tension Clamp for tower type "TDT" as per specification                                                                                                                                                                                                                                                                 |  | Set | 16 |  |  |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                     |  |         |     |  |  |  |  |  |  |  |  |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------|-----|--|--|--|--|--|--|--|--|
| 10       | Furnish Jumper Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                                 |  | Set     | 64  |  |  |  |  |  |  |  |  |
| 11       | Furnish Straight Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                               |  | Set     | 16  |  |  |  |  |  |  |  |  |
| 12       | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010  |  | Set     | 6   |  |  |  |  |  |  |  |  |
| 13       | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011 |  | Set     | 6   |  |  |  |  |  |  |  |  |
| 14       | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assemblies (items C1 - 8 & C12-13) with Coulomb or ElecNET software.                                                                       |  | Lumpsum | 1   |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total C :</b>                                                                                                                                                                                                                                |  |         |     |  |  |  |  |  |  |  |  |
| <b>D</b> | <b><u>Hardware for OPGW</u></b>                                                                                                                                                                                                                     |  |         |     |  |  |  |  |  |  |  |  |
| 1        | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                               |  | Set     | 134 |  |  |  |  |  |  |  |  |
| 2        | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                                                                                                        |  | Set     | 14  |  |  |  |  |  |  |  |  |
| 3        | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                                                                                           |  | Set     | 44  |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total D :</b>                                                                                                                                                                                                                                |  |         |     |  |  |  |  |  |  |  |  |
| <b>E</b> | <b><u>Accessories and Dampers</u></b>                                                                                                                                                                                                               |  |         |     |  |  |  |  |  |  |  |  |
| 1        | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                                                                                            |  | No.     | 244 |  |  |  |  |  |  |  |  |



|                      |                                                                                                                                                                                                                                                                                                                        |  |       |       |  |  |  |  |  |  |  |  |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------|-------|--|--|--|--|--|--|--|--|
| 2                    | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                                                                                                                                                                    |  | No.   | 122   |  |  |  |  |  |  |  |  |
| 3                    | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor.                                                                                                                                               |  | No.   | 1,162 |  |  |  |  |  |  |  |  |
| 4                    | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                                                                                                                                                              |  | No.   | 3,758 |  |  |  |  |  |  |  |  |
| 5                    | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor (See Note-3)                                                                                                                                                                                                                                |  | No.   | 940   |  |  |  |  |  |  |  |  |
| 6                    | Furnish stock bridge vibration dampers for OPGW.                                                                                                                                                                                                                                                                       |  | No.   | 453   |  |  |  |  |  |  |  |  |
| <b>Sub-Total E :</b> |                                                                                                                                                                                                                                                                                                                        |  |       |       |  |  |  |  |  |  |  |  |
| <b>F</b>             | <b><u>Grounding Material</u></b>                                                                                                                                                                                                                                                                                       |  |       |       |  |  |  |  |  |  |  |  |
| 1                    | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                                                                                                                                                                          |  | No.   | 178   |  |  |  |  |  |  |  |  |
| 2                    | Furnish flat to cable connector.                                                                                                                                                                                                                                                                                       |  | No.   | 178   |  |  |  |  |  |  |  |  |
| 3                    | Furnish cable to rod connector.                                                                                                                                                                                                                                                                                        |  | No.   | 178   |  |  |  |  |  |  |  |  |
| 4                    | Furnish 7 No. 10 copper covered ground wire.                                                                                                                                                                                                                                                                           |  | Meter | 534   |  |  |  |  |  |  |  |  |
| <b>Sub-Total F :</b> |                                                                                                                                                                                                                                                                                                                        |  |       |       |  |  |  |  |  |  |  |  |
| <b>G</b>             | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                                                                                                                                                                    |  |       |       |  |  |  |  |  |  |  |  |
| <b>1</b>             | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                                             |  |       |       |  |  |  |  |  |  |  |  |
|                      | Furnish 500kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |  |       |       |  |  |  |  |  |  |  |  |
|                      | (a) <u>Tower Type "DS1"</u>                                                                                                                                                                                                                                                                                            |  |       |       |  |  |  |  |  |  |  |  |
|                      | (i) Basic Tower Body                                                                                                                                                                                                                                                                                                   |  | No.   | 7     |  |  |  |  |  |  |  |  |
|                      | (ii) 2.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        |  | No.   | 4     |  |  |  |  |  |  |  |  |
|                      | (iii) 4.0 m Single Leg Extension                                                                                                                                                                                                                                                                                       |  | No.   | 8     |  |  |  |  |  |  |  |  |
|                      | (iv) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        |  | No.   | 8     |  |  |  |  |  |  |  |  |

|     |                                                              |                              |     |       |  |  |  |  |  |  |  |  |  |
|-----|--------------------------------------------------------------|------------------------------|-----|-------|--|--|--|--|--|--|--|--|--|
|     | (v)                                                          | 8.0 m Single Leg Extension   | No. | 16    |  |  |  |  |  |  |  |  |  |
|     | (vi)                                                         | 6.0 m Body Extension         | No. | 1     |  |  |  |  |  |  |  |  |  |
|     | (vii)                                                        | Stubs                        | No. | 32    |  |  |  |  |  |  |  |  |  |
| (b) | <u>Tower Type "DA1"</u>                                      |                              |     |       |  |  |  |  |  |  |  |  |  |
|     | (i)                                                          | Basic Tower Body             | No. | 3     |  |  |  |  |  |  |  |  |  |
|     | (ii)                                                         | 2.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|     | (iii)                                                        | 4.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|     | (iv)                                                         | 6.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|     | (v)                                                          | 8.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|     | (vi)                                                         | 6.0 m Body Extension         | No. | 1     |  |  |  |  |  |  |  |  |  |
|     | (vii)                                                        | Stubs                        | No. | 12    |  |  |  |  |  |  |  |  |  |
| (c) | <u>Tower Type "DD1"</u>                                      |                              |     |       |  |  |  |  |  |  |  |  |  |
|     | (i)                                                          | Basic Tower Body             | No. | 3     |  |  |  |  |  |  |  |  |  |
|     | (ii)                                                         | 2.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|     | (iii)                                                        | 4.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|     | (iv)                                                         | 6.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|     | (v)                                                          | 8.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|     | (vi)                                                         | 6.0 m Body Extension         | No. | 1     |  |  |  |  |  |  |  |  |  |
|     | (vii)                                                        | Stubs                        | No. | 12    |  |  |  |  |  |  |  |  |  |
| (d) | <u>Tower Type "TDT"</u>                                      |                              |     |       |  |  |  |  |  |  |  |  |  |
|     | (i)                                                          | Basic Tower Body             | No. | -     |  |  |  |  |  |  |  |  |  |
|     | (ii)                                                         | 6.0 m Single Leg Extension   | No. | -     |  |  |  |  |  |  |  |  |  |
|     | (iii)                                                        | Stubs                        | No. | -     |  |  |  |  |  |  |  |  |  |
|     | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                              |     |       |  |  |  |  |  |  |  |  |  |
| 2   | Furnish 795 KCM ACSR "Drake" Conductor                       |                              | km  | 70.40 |  |  |  |  |  |  |  |  |  |
| 3   | Furnish                                                      |                              |     |       |  |  |  |  |  |  |  |  |  |
|     | (a)                                                          | OPGW with at least 24 fibers | km  | 10    |  |  |  |  |  |  |  |  |  |
|     | (b)                                                          | Joint boxes for OPGW         |     |       |  |  |  |  |  |  |  |  |  |
|     | (i)                                                          | OPGW-OPGW (A Type)           | No. | 1     |  |  |  |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                                    |                            |     |    |  |  |  |  |  |  |  |  |  |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----|----|--|--|--|--|--|--|--|--|--|
|   | (ii)                                                                                                                                                                                                                                                               | OPGW-OPGW Cable ( B Type)  | No. | -  |  |  |  |  |  |  |  |  |  |
|   | (iii)                                                                                                                                                                                                                                                              | OPGW-attaching Clamps      | No. | 60 |  |  |  |  |  |  |  |  |  |
|   | (iv)                                                                                                                                                                                                                                                               | Fibre Optic Approach Cable | km  | -  |  |  |  |  |  |  |  |  |  |
|   | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                                       |                            |     |    |  |  |  |  |  |  |  |  |  |
| 4 | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001                  |                            | Set | 42 |  |  |  |  |  |  |  |  |  |
| 5 | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002           |                            | Set | 36 |  |  |  |  |  |  |  |  |  |
| 6 | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005 |                            | Set | 72 |  |  |  |  |  |  |  |  |  |
| 7 | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                 |                            | Set | 6  |  |  |  |  |  |  |  |  |  |
| 8 | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                |                            | Set | 6  |  |  |  |  |  |  |  |  |  |
|   | <b><u>Hardware for OPGW</u></b>                                                                                                                                                                                                                                    |                            |     |    |  |  |  |  |  |  |  |  |  |
| 9 | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                                              |                            | Set | 14 |  |  |  |  |  |  |  |  |  |

|    |                                                                                                                                                                          |  |       |     |  |  |  |  |  |  |  |   |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------|-----|--|--|--|--|--|--|--|---|
| 10 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                             |  | Set   | 2   |  |  |  |  |  |  |  |   |
| 11 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                |  | Set   | 12  |  |  |  |  |  |  |  |   |
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |  |       |     |  |  |  |  |  |  |  |   |
| 12 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 |  | No.   | 24  |  |  |  |  |  |  |  |   |
| 13 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      |  | No.   | 12  |  |  |  |  |  |  |  |   |
| 14 | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. |  | No.   | 370 |  |  |  |  |  |  |  |   |
| 15 | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                |  | No.   | 619 |  |  |  |  |  |  |  |   |
| 16 | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor                                                                                               |  | No.   | 155 |  |  |  |  |  |  |  |   |
| 17 | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         |  | No.   | 78  |  |  |  |  |  |  |  |   |
|    | <b><u>Grounding Material</u></b>                                                                                                                                         |  |       |     |  |  |  |  |  |  |  |   |
| 18 | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            |  | No.   | 26  |  |  |  |  |  |  |  |   |
| 19 | Furnish flat to cable connector.                                                                                                                                         |  | No.   | 26  |  |  |  |  |  |  |  |   |
| 20 | Furnish cable to rod connector.                                                                                                                                          |  | No.   | 26  |  |  |  |  |  |  |  |   |
| 21 | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             |  | Meter | 78  |  |  |  |  |  |  |  |   |
|    | <b>Sub-Total of G :</b>                                                                                                                                                  |  |       |     |  |  |  |  |  |  |  | - |
|    | Total of Item A                                                                                                                                                          |  |       |     |  |  |  |  |  |  |  | - |
|    | Total of Item B                                                                                                                                                          |  |       |     |  |  |  |  |  |  |  | - |
|    | Total of Item C                                                                                                                                                          |  |       |     |  |  |  |  |  |  |  | - |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                 |  |  |  |  |  |  |  |   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--|--|--|--|--|--|--|---|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Total of Item D |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Total of Item E |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Total of Item F |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Total of Item G |  |  |  |  |  |  |  | - |
| <b>Grand Total of column No. 11 &amp; 12 to be carried forward to Grand summary</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                 |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                 |  |  |  |  |  |  |  |   |
| <p>* The Bidder shall specify the type of insulator being offered.</p> <p><b>Notes:</b></p> <p>1 Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types DS1, DA1, DD1, and TDT, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly.</p> <p>2 The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.</p> <p>3 The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.</p> <p>4 The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.</p> <p>5 The bidder shall be responsible to furnish the tower material, OPGW, conductor, insulators, accessories, dampers &amp; hardware for conductor and OPGW, for completion of line in all respect. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.</p> <p>6 The contractor shall transport, unload and stack leftover/additional material from site to NGC designated Warehouse/Store at its own cost.</p> <p>7 Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.</p> <p>8 The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully before filling up the schedule of prices.</p> |                 |  |  |  |  |  |  |  |   |

- 9 Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.
- 10 Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.
- 11 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.

**Signature of  
Bidder**

| Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme<br>Lot-V: 500 kV D/C C5-Ludewala —Section C (Approx. 29 km) |                                                                                                                                                                                                                                                                                                                         |                                  |      |          |                |           |                 |                             |                                   |                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|------|----------|----------------|-----------|-----------------|-----------------------------|-----------------------------------|--------------------------------------|
| SCHEDULE NO.2- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM WITHIN PAKISTAN                                                                                                                                     |                                                                                                                                                                                                                                                                                                                         |                                  |      |          |                |           |                 |                             |                                   |                                      |
| Item No.                                                                                                                                                                                                         | Description                                                                                                                                                                                                                                                                                                             |                                  | Unit | Quantity | Unit Price     |           | Total EXW Price | Total Inland Transportation | Total Price<br><br>Local Currency | Sales and other Taxes & Duties (PKR) |
|                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                         |                                  |      |          | Local Currency | EXW Price |                 |                             |                                   |                                      |
| 1                                                                                                                                                                                                                | 2                                                                                                                                                                                                                                                                                                                       |                                  | 3    | 4        | 5              | 6         | 7 = 4 x 6       | 8                           | 9 = 7+ 8                          | 10                                   |
|                                                                                                                                                                                                                  | 500kV Double Circuit Transmission Line                                                                                                                                                                                                                                                                                  |                                  |      |          |                |           |                 |                             |                                   |                                      |
| A                                                                                                                                                                                                                | Steel Towers                                                                                                                                                                                                                                                                                                            |                                  |      |          |                |           |                 |                             |                                   |                                      |
| 1                                                                                                                                                                                                                | Furnish 500 kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                                  |      |          |                |           |                 |                             |                                   |                                      |
|                                                                                                                                                                                                                  | (a)                                                                                                                                                                                                                                                                                                                     | Tower Type "DS1"                 |      |          |                |           |                 |                             |                                   |                                      |
|                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                         | (i) Basic Tower Body             | No.  | 67       |                |           |                 |                             |                                   |                                      |
|                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                         | (ii) 2.0 m Single Leg Extension  | No.  | -        |                |           |                 |                             |                                   |                                      |
|                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                         | (iii) 4.0 m Single Leg Extension | No.  | 56       |                |           |                 |                             |                                   |                                      |
|                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                         | (iv) 6.0 m Single Leg Extension  | No.  | 76       |                |           |                 |                             |                                   |                                      |
|                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                         | (v) 8.0 m Single Leg Extension   | No.  | 140      |                |           |                 |                             |                                   |                                      |
|                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                         | (vi) 6.0 m Body Extension        | No.  | 7        |                |           |                 |                             |                                   |                                      |
|                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                         | (vii) Stubs                      | No.  | 268      |                |           |                 |                             |                                   |                                      |
|                                                                                                                                                                                                                  | (b)                                                                                                                                                                                                                                                                                                                     | Tower Type "DA1"                 |      |          |                |           |                 |                             |                                   |                                      |
|                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                         | (i) Basic Tower Body             | No.  | 12       |                |           |                 |                             |                                   |                                      |

|          |                                                              |                              |     |        |  |  |  |  |  |  |
|----------|--------------------------------------------------------------|------------------------------|-----|--------|--|--|--|--|--|--|
|          | (ii)                                                         | 2.0 m Single Leg Extension   | No. | -      |  |  |  |  |  |  |
|          | (iii)                                                        | 4.0 m Single Leg Extension   | No. | 12     |  |  |  |  |  |  |
|          | (iv)                                                         | 6.0 m Single Leg Extension   | No. | 12     |  |  |  |  |  |  |
|          | (v)                                                          | 8.0 m Single Leg Extension   | No. | 24     |  |  |  |  |  |  |
|          | (vi)                                                         | 6.0 m Body Extension         | No. | 3      |  |  |  |  |  |  |
|          | (vii)                                                        | Stubs                        | No. | 48     |  |  |  |  |  |  |
|          | (c)                                                          | <u>Tower Type "DD1"</u>      |     |        |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body             | No. | 9      |  |  |  |  |  |  |
|          | (ii)                                                         | 2.0 m Single Leg Extension   | No. | -      |  |  |  |  |  |  |
|          | (iii)                                                        | 4.0 m Single Leg Extension   | No. | 4      |  |  |  |  |  |  |
|          | (iv)                                                         | 6.0 m Single Leg Extension   | No. | 12     |  |  |  |  |  |  |
|          | (v)                                                          | 8.0 m Single Leg Extension   | No. | 20     |  |  |  |  |  |  |
|          | (vi)                                                         | 6.0 m Body Extension         | No. | 2      |  |  |  |  |  |  |
|          | (vii)                                                        | Stubs                        | No. | 36     |  |  |  |  |  |  |
|          | (d)                                                          | <u>Tower Type "TDT"</u>      |     |        |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body             | No. | 1      |  |  |  |  |  |  |
|          | (ii)                                                         | 8.0 m Single Leg Extension   | No. | 4      |  |  |  |  |  |  |
|          | (iii)                                                        | Stubs                        | No. | 4      |  |  |  |  |  |  |
|          | <b>Sub-Total A :</b>                                         |                              |     |        |  |  |  |  |  |  |
| <b>B</b> | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                              |     |        |  |  |  |  |  |  |
| 1        | Furnish 795 KCM ACSR "Drake" Conductor                       |                              | km  | 710.40 |  |  |  |  |  |  |
| 2        | Furnish                                                      |                              |     |        |  |  |  |  |  |  |
|          | (a)                                                          | OPGW with at least 24 fibers | km  | 70     |  |  |  |  |  |  |
|          | (b)                                                          | Joint boxes for OPGW         |     |        |  |  |  |  |  |  |



|          |                                                                                                                                                                                                                                                                    |                                                    |                                                            |     |     |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------|-----|-----|--|--|--|--|--|--|
|          |                                                                                                                                                                                                                                                                    | (i)                                                | OPGW-OPGW (A Type)                                         | No. | 14  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                    | (ii)                                               | OPGW-OPGW Cable ( B Type)                                  | No. | -   |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                    | (iii)                                              | OPGW-attaching Clamps                                      | No. | 840 |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                    | (iv)                                               | Fibre Optic Approach Cable                                 | km  | -   |  |  |  |  |  |  |
|          | (c)                                                                                                                                                                                                                                                                | Test Equipment, Installation and Maintenance Tools |                                                            |     | -   |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                    | -                                                  | Fiber Optic Talk Set (Set comprised two units)             | Set | 1   |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                    | -                                                  | Fiber Optic Tool Kit                                       | Set | 1   |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                    | -                                                  | OTDR with range $\geq$ 400km Yokogawa AQ7260 or equivalent | Set | 1   |  |  |  |  |  |  |
|          | <b>Sub Total B :</b>                                                                                                                                                                                                                                               |                                                    |                                                            |     |     |  |  |  |  |  |  |
| <b>C</b> | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                                       |                                                    |                                                            |     |     |  |  |  |  |  |  |
| 1        | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001                  |                                                    |                                                            | Set | 402 |  |  |  |  |  |  |
| 2        | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002           |                                                    |                                                            | Set | 126 |  |  |  |  |  |  |
| 3        | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005 |                                                    |                                                            | Set | 252 |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                                                                                                         |     |    |  |  |  |  |  |  |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|--|--|--|--|--|--|
| 4 | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower type 'TDT' including Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing<br>(Note: No. of Insulators in each arm/string = 29 Nos.) as per specification drawing No. 4029/169/401C/TD/01E005a | Set | 8  |  |  |  |  |  |  |
| 5 | Furnish Single string Transposition Assembly Upright type "TDTU(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E006<br>(Note: No. of Insulators in each arm/string = 36 Nos.)            | Set | 4  |  |  |  |  |  |  |
| 6 | Furnish Single string Transposition Assembly Inverted type "TDTI(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E007<br>(Note: No. of Insulators in each arm/string = 36 Nos.)           | Set | 4  |  |  |  |  |  |  |
| 7 | Furnish Quad string special dead end assemblies type "SDE(4)" for Pre-RTV Coated 160kN E&M strength insulators for tower type "TDT" as per specification drawing No. 4029/169/401C/TD/01E008<br>(Note: No. of Insulators in each arm/string = 29 Nos.)                                                                                  | Set | 4  |  |  |  |  |  |  |
| 8 | Furnish Pipe Jumper Assembly type "VJT(4)" for Pre-RTV Coated 80kN E&M strength insulators for tower type "TDT" including jumper spacers & special jumper spacers as per specification drawing No. 4029/169/401C/TD/01E009<br>(Note: No. of Insulators in each arm/string = 54 Nos.)                                                    | Set | 4  |  |  |  |  |  |  |
| 9 | Furnish Special Tension Clamp for tower type "TDT" as per specification                                                                                                                                                                                                                                                                 | Set | 16 |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                     |         |     |  |  |  |  |  |  |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|--|--|--|--|--|--|
| 10       | Furnish Jumper Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                                 | Set     | 64  |  |  |  |  |  |  |
| 11       | Furnish Straight Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                               | Set     | 16  |  |  |  |  |  |  |
| 12       | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010  | Set     | 6   |  |  |  |  |  |  |
| 13       | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011 | Set     | 6   |  |  |  |  |  |  |
| 14       | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assemblies (items C1 - 8 & C12-13) with Coulomb or ElecNET software.                                                                       | Lumpsum | 1   |  |  |  |  |  |  |
|          | <b>Sub-Total C :</b>                                                                                                                                                                                                                                |         |     |  |  |  |  |  |  |
| <b>D</b> | <b><u>Hardware for OPGW</u></b>                                                                                                                                                                                                                     |         |     |  |  |  |  |  |  |
| 1        | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                               | Set     | 134 |  |  |  |  |  |  |
| 2        | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                                                                                                        | Set     | 14  |  |  |  |  |  |  |
| 3        | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                                                                                           | Set     | 44  |  |  |  |  |  |  |
|          | <b>Sub-Total D :</b>                                                                                                                                                                                                                                |         |     |  |  |  |  |  |  |
| <b>E</b> | <b><u>Accessories and Dampers</u></b>                                                                                                                                                                                                               |         |     |  |  |  |  |  |  |
| 1        | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                                                                                            | No.     | 244 |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                                                                                        |       |       |  |  |  |  |  |  |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|--|--|--|--|--|--|
| 2        | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                                                                                                                                                                    | No.   | 122   |  |  |  |  |  |  |
| 3        | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor.                                                                                                                                               | No.   | 1,162 |  |  |  |  |  |  |
| 4        | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                                                                                                                                                              | No.   | 3,758 |  |  |  |  |  |  |
| 5        | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor (See Note-3)                                                                                                                                                                                                                                | No.   | 940   |  |  |  |  |  |  |
| 6        | Furnish stock bridge vibration dampers for OPGW.                                                                                                                                                                                                                                                                       | No.   | 453   |  |  |  |  |  |  |
|          | <b>Sub-Total E :</b>                                                                                                                                                                                                                                                                                                   |       |       |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        |       |       |  |  |  |  |  |  |
| <b>F</b> | <b><u>Grounding Material</u></b>                                                                                                                                                                                                                                                                                       |       |       |  |  |  |  |  |  |
| 1        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                                                                                                                                                                          | No.   | 178   |  |  |  |  |  |  |
| 2        | Furnish flat to cable connector.                                                                                                                                                                                                                                                                                       | No.   | 178   |  |  |  |  |  |  |
| 3        | Furnish cable to rod connector.                                                                                                                                                                                                                                                                                        | No.   | 178   |  |  |  |  |  |  |
| 4        | Furnish 7 No. 10 copper covered ground wire.                                                                                                                                                                                                                                                                           | Meter | 534   |  |  |  |  |  |  |
|          | <b>Sub-Total F :</b>                                                                                                                                                                                                                                                                                                   |       |       |  |  |  |  |  |  |
| <b>G</b> | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                                                                                                                                                                    |       |       |  |  |  |  |  |  |
| <b>1</b> | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                                             |       |       |  |  |  |  |  |  |
|          | Furnish 500kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |       |       |  |  |  |  |  |  |
|          | (a) <u>Tower Type "DS1"</u>                                                                                                                                                                                                                                                                                            |       |       |  |  |  |  |  |  |
|          | (i) Basic Tower Body                                                                                                                                                                                                                                                                                                   | No.   | 7     |  |  |  |  |  |  |
|          | (ii) 2.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No.   | 4     |  |  |  |  |  |  |
|          | (iii) 4.0 m Single Leg Extension                                                                                                                                                                                                                                                                                       | No.   | 8     |  |  |  |  |  |  |
|          | (iv) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                                        | No.   | 8     |  |  |  |  |  |  |

|     |                                                              |                              |     |       |  |  |  |  |  |  |
|-----|--------------------------------------------------------------|------------------------------|-----|-------|--|--|--|--|--|--|
|     | (v)                                                          | 8.0 m Single Leg Extension   | No. | 16    |  |  |  |  |  |  |
|     | (vi)                                                         | 6.0 m Body Extension         | No. | 1     |  |  |  |  |  |  |
|     | (vii)                                                        | Stubs                        | No. | 32    |  |  |  |  |  |  |
| (b) | <u>Tower Type "DA1"</u>                                      |                              |     |       |  |  |  |  |  |  |
|     | (i)                                                          | Basic Tower Body             | No. | 3     |  |  |  |  |  |  |
|     | (ii)                                                         | 2.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |
|     | (iii)                                                        | 4.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |
|     | (iv)                                                         | 6.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |
|     | (v)                                                          | 8.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |
|     | (vi)                                                         | 6.0 m Body Extension         | No. | 1     |  |  |  |  |  |  |
|     | (vii)                                                        | Stubs                        | No. | 12    |  |  |  |  |  |  |
| (c) | <u>Tower Type "DD1"</u>                                      |                              |     |       |  |  |  |  |  |  |
|     | (i)                                                          | Basic Tower Body             | No. | 3     |  |  |  |  |  |  |
|     | (ii)                                                         | 2.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |
|     | (iii)                                                        | 4.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |
|     | (iv)                                                         | 6.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |
|     | (v)                                                          | 8.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |
|     | (vi)                                                         | 6.0 m Body Extension         | No. | 1     |  |  |  |  |  |  |
|     | (vii)                                                        | Stubs                        | No. | 12    |  |  |  |  |  |  |
| (d) | <u>Tower Type "TDT"</u>                                      |                              |     |       |  |  |  |  |  |  |
|     | (i)                                                          | Basic Tower Body             | No. | -     |  |  |  |  |  |  |
|     | (ii)                                                         | 6.0 m Single Leg Extension   | No. | -     |  |  |  |  |  |  |
|     | (iii)                                                        | Stubs                        | No. | -     |  |  |  |  |  |  |
|     | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                              |     |       |  |  |  |  |  |  |
| 2   | Furnish 795 KCM ACSR "Drake" Conductor                       |                              | km  | 70.40 |  |  |  |  |  |  |
| 3   | Furnish                                                      |                              |     |       |  |  |  |  |  |  |
|     | (a)                                                          | OPGW with at least 24 fibers | km  | 10    |  |  |  |  |  |  |
|     | (b)                                                          | Joint boxes for OPGW         |     |       |  |  |  |  |  |  |
|     | (i)                                                          | OPGW-OPGW (A Type)           | No. | 1     |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                                    |                            |     |    |  |  |  |  |  |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----|----|--|--|--|--|--|
|   | (ii)                                                                                                                                                                                                                                                               | OPGW-OPGW Cable ( B Type)  | No. | -  |  |  |  |  |  |
|   | (iii)                                                                                                                                                                                                                                                              | OPGW-attaching Clamps      | No. | 60 |  |  |  |  |  |
|   | (iv)                                                                                                                                                                                                                                                               | Fibre Optic Approach Cable | km  | -  |  |  |  |  |  |
|   | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                                       |                            |     |    |  |  |  |  |  |
| 4 | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001                  |                            | Set | 42 |  |  |  |  |  |
| 5 | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002           |                            | Set | 36 |  |  |  |  |  |
| 6 | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005 |                            | Set | 72 |  |  |  |  |  |
| 7 | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                 |                            | Set | 6  |  |  |  |  |  |
| 8 | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                |                            | Set | 6  |  |  |  |  |  |
|   | <b><u>Hardware for OPGW</u></b>                                                                                                                                                                                                                                    |                            |     |    |  |  |  |  |  |
| 9 | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                                              |                            | Set | 14 |  |  |  |  |  |

|    |                                                                                                                                                                          |       |     |  |  |  |  |   |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|--|--|--|--|---|
| 10 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                             | Set   | 2   |  |  |  |  |   |
| 11 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                | Set   | 12  |  |  |  |  |   |
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |       |     |  |  |  |  |   |
| 12 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 | No.   | 24  |  |  |  |  |   |
| 13 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      | No.   | 12  |  |  |  |  |   |
| 14 | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No.   | 370 |  |  |  |  |   |
| 15 | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No.   | 619 |  |  |  |  |   |
| 16 | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor                                                                                               | No.   | 155 |  |  |  |  |   |
| 17 | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No.   | 78  |  |  |  |  |   |
|    | <b><u>Grounding Material</u></b>                                                                                                                                         |       |     |  |  |  |  |   |
| 18 | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            | No.   | 26  |  |  |  |  |   |
| 19 | Furnish flat to cable connector.                                                                                                                                         | No.   | 26  |  |  |  |  |   |
| 20 | Furnish cable to rod connector.                                                                                                                                          | No.   | 26  |  |  |  |  |   |
| 21 | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             | Meter | 78  |  |  |  |  |   |
|    | <b>Sub-Total of G :</b>                                                                                                                                                  |       |     |  |  |  |  | - |
|    | Total of Item A                                                                                                                                                          |       |     |  |  |  |  | - |
|    | Total of Item B                                                                                                                                                          |       |     |  |  |  |  | - |
|    | Total of Item C                                                                                                                                                          |       |     |  |  |  |  | - |

|                                                           |                 |  |  |  |  |  |   |
|-----------------------------------------------------------|-----------------|--|--|--|--|--|---|
|                                                           | Total of Item D |  |  |  |  |  | - |
|                                                           | Total of Item E |  |  |  |  |  | - |
|                                                           | Total of Item F |  |  |  |  |  | - |
|                                                           | Total of Item G |  |  |  |  |  | - |
| <b>Total of Column 9 to be forwarded to Grand Summary</b> |                 |  |  |  |  |  | - |
|                                                           |                 |  |  |  |  |  |   |

- \* The Bidder shall specify the type of insulator being offered.

**Notes:**

- 1 Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types DS1, DA1, DD1, and TDT, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly.
- 2 The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.
- 3 The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.
- 4 The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.
- 5 The bidder shall be responsible to furnish the tower material, OPGW, conductor, insulators, accessories, dampers & hardware for conductor and OPGW, for completion of line in all respect. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.
- 6 The contractor shall transport, unload and stack leftover/additional material from site to NGC designated Warehouse/Store at its own cost.
- 7 Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.
- 8 The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully before filling up the schedule of prices.



- 9 Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.
- 10 Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.
- 10 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.

**Signature of Bidder**

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**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-V: 500 kV D/C C5-Ludewala – Section C (Approx. 29 km)**

**Schedule No.3 - Design Services**

| Item                                                  | Description | Qty. | Unit Price <sup>1</sup><br>Local<br>Currency | Total Price | Total<br>Provincial<br>Sales Tax |
|-------------------------------------------------------|-------------|------|----------------------------------------------|-------------|----------------------------------|
| 1                                                     | 2           | 3    | 4                                            | 5 = 3 x 4   | 6                                |
| 1                                                     |             | Lot  |                                              |             |                                  |
| NOT APPLICABLE                                        |             |      |                                              |             |                                  |
| 2                                                     |             | Lot  |                                              |             |                                  |
| 3                                                     |             | Lot  |                                              |             |                                  |
| TOTAL Column 5 to be carried forward to Grand Summary |             |      |                                              |             |                                  |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>1</sup>Specify currency in accordance ITB 12.

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme  
Lot-V: 500 kV D/C C5-Ludewala —Section C (Approx. 29 km)**

**SCHEDULE NO.4 - INSTALLATION AND OTHER SERVICES**

**(INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)**

| Item No.                                                                                  | Description                 | Unit     | Qty | Unit Price (PKR) | Total Price (PKR) Including all Custom duties, taxes and other levies etc. w/o Provincial Sales Tax | Total Provincial Sales tax (PST) in PKR |
|-------------------------------------------------------------------------------------------|-----------------------------|----------|-----|------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------|
| 1                                                                                         | 2                           | 3        | 4   | 5                | 6=4*5                                                                                               | 7                                       |
| <b>INSTALLATION (INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)</b> |                             |          |     |                  |                                                                                                     |                                         |
| <b>A</b>                                                                                  | <b><u>Survey</u></b>        |          |     |                  |                                                                                                     |                                         |
| 1                                                                                         | Clearing Right of Way (ROW) | Lump Sum | 1   |                  |                                                                                                     |                                         |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |     |  |  |  |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----|--|--|--|
| 2        | Validation of already established centre line prior to foundation construction and preparation of as-built plan & profile drawings of the already prepared plan & profile drawings using PLS-CADD and construction structure lists (to be provided to the Contractor after award of contract) of the constructed transmission line after incorporating all the changes and submitted to the Project Manager. In case of route diversion, payment of the diverted portion will be made as per item A.3 | km        | 29  |  |  |  |
| 3        | Route alignment and detailed surveying of diverted portion not limited to chainage and leveling, preparation of plan & profile drawings, spotting of towers and preparation of construction structure list & Latitude & Longitude with hand held GPS of each tower location                                                                                                                                                                                                                           | km        | 2.9 |  |  |  |
|          | <b>Sub-Total A:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |     |  |  |  |
| <b>B</b> | <b><u>Sub-soil Investigations:</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |     |  |  |  |
|          | Sub-Soil Investigation for T/Line at (ii) and confirmatory sub-soil Investigation in varied soil/boulder/rock (including laboratory tests) as per Specifications (Technical Provisions for Construction Clause 10.2) and submission of Sub-Soil Investigation Report.                                                                                                                                                                                                                                 |           |     |  |  |  |
| (a)      | From NSL to depth of 15 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Lin. Mtr. | 45  |  |  |  |
| (b)      | From 15 m to depth of 25 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Lin. Mtr. | 10  |  |  |  |
| (c)      | Hand Auger upto depth of 10m                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Lin. Mtr. | 40  |  |  |  |
|          | <b>Sub-Total B:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |     |  |  |  |
| <b>C</b> | <b><u>Foundations</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |     |  |  |  |

|          |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |   |  |  |  |
|----------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---|--|--|--|
|          |                                | Reinforced Concrete Spread Foundations (4 legs) complete in all respect in varied soil as well as boulders/rock complete with supply of materials including alignment, peg marking, access, preparatory works, excavation, blasting, leveling, grading of tower site, cutting, dewatering, shuttering, reinforcement, concreting (using Sulphate Resistance Cement conforming to ASTM C-150 Type-V), lean concrete (if required), curing, backfilling of foundations after concreting with excavated/borrowed earth (irrespective of lead), application of three (03) coats hot bitumen (ExpanProof* 10 – Fospak bitumen and compaction of backfill material in layers, stub setting and site restoration etc. including tower staking (Latitude & Longitude with hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type as per drawings and specifications: |            |   |  |  |  |
|          | (a)                            | DS1 (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G010                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |   |  |  |  |
|          | (i)                            | Foundation Type D1 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 3 |  |  |  |
|          | (ii)                           | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Foundation | 0 |  |  |  |
|          | (iii)                          | Foundation Type W (Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Foundation | 0 |  |  |  |
|          | (b)                            | DA1 (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |   |  |  |  |
|          | (i)                            | Foundation Type D1 (Dry) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Foundation | 0 |  |  |  |
|          | (ii)                           | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Foundation | 0 |  |  |  |
|          | (c)                            | DD1 (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G012                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |   |  |  |  |
|          | (i)                            | Foundation Type D1 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 1 |  |  |  |
|          | (ii)                           | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Foundation | 0 |  |  |  |
|          | <b>Sub-Total C:</b>            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |   |  |  |  |
| <b>D</b> | <b><u>Pile Foundations</u></b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |   |  |  |  |

|  |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |           |  |  |  |
|--|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|--|--|--|
|  | D-1  | Reinforced concrete pile foundations (cast in situ installation) complete in all type of soil as well as boulders/gravels/rock with supply of materials including excavation, drilling/boring, shuttering, reinforcement, concreting, bitumen coating, backfilling, installation of Stubs, tower grounding, site clearing etc. using Sulphate Resistance Cement conforming to ASTM C-150 Type-V shall be used including tower staking (Latitude & Longitude with RTK/hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type: |            |           |  |  |  |
|  | (a)  | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DS1, and drawing No. <b>4029/169/TLC-22/TD/01G014</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Foundation | <b>55</b> |  |  |  |
|  | (b)  | Reinforced concrete single pile per footing 900 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G014</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |           |  |  |  |
|  | (i)  | Pile shaft upto depth of 20 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Lin.mtr    | 4400      |  |  |  |
|  | (ii) | Pile shaft depth 20 - 25 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lin.mtr    | 120       |  |  |  |
|  | (c)  | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DA1, and drawing No. <b>4029/169/TLC-22/TD/01G015</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Foundation | <b>7</b>  |  |  |  |
|  | (d)  | Reinforced concrete single pile per footing 1200 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G015</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |           |  |  |  |
|  | (i)  | Pile shaft upto depth of 20 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Lin.mtr    | 560       |  |  |  |
|  | (ii) | Pile shaft depth 20 - 25 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lin.mtr    | 140       |  |  |  |
|  | (e)  | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DD1/DT1, and drawing No. <b>4029/169/TLC-22/TD/01G016</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Foundation | <b>6</b>  |  |  |  |
|  | (f)  | Reinforced concrete single pile per footing 1500 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G016</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |           |  |  |  |

|     |       |                                                                                                                                 |            |          |  |  |  |
|-----|-------|---------------------------------------------------------------------------------------------------------------------------------|------------|----------|--|--|--|
|     | (i)   | Pile shaft upto depth of 20 m                                                                                                   | Lin.mtr    | 480      |  |  |  |
|     | (ii)  | Pile shaft depth 20 - 25 m                                                                                                      | Lin.mtr    | 120      |  |  |  |
|     | (iii) | Pile shaft depth 25 - 30 m                                                                                                      | Lin.mtr    | 40       |  |  |  |
| (g) |       | Reinforced concrete pile caps with Tie Beam and stub setting as per tower type and drawing No. <b>3217/169/TD/01G109</b>        | Foundation | <b>8</b> |  |  |  |
| (h) |       | Reinforced concrete single pile per footing 1200 mm dia. as per drawing No. <b>3217/169/TD/01G109</b>                           |            |          |  |  |  |
|     | (i)   | Pile shaft upto depth of 20 m                                                                                                   | Lin.mtr    | 640      |  |  |  |
|     | (ii)  | Pile shaft depth 20 - 25 m                                                                                                      | Lin.mtr    | 160      |  |  |  |
|     | (iii) | Pile shaft depth 25 - 30 m                                                                                                      | Lin.mtr    | 160      |  |  |  |
|     | (iii) | Pile shaft depth 30 - 35 m                                                                                                      | Lin.mtr    | 40       |  |  |  |
| (i) |       | Reinforced concrete pile caps with Tie Beam and stub setting as per tower type and drawing No. <b>4029/169/TLC-22/TD/01G017</b> | Foundation | <b>3</b> |  |  |  |
| (j) |       | Reinforced concrete single pile per footing 1500 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G017</b>                    |            |          |  |  |  |
|     | (i)   | Pile shaft upto depth of 20 m                                                                                                   | Lin.mtr    | 240      |  |  |  |
|     | (ii)  | Pile shaft depth 20 - 30 m                                                                                                      | Lin.mtr    | 120      |  |  |  |
|     | (iii) | Pile shaft depth 30 - 40 m                                                                                                      | Lin.mtr    | 80       |  |  |  |

|  |       |                                                                                                                                                                |            |    |  |  |  |
|--|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----|--|--|--|
|  | (k)   | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, TDT, and drawing No. <b>NPP-03C-2019/K2K3PQMTL/ICC/012</b>                | Foundation | 1  |  |  |  |
|  | (l)   | Reinforced concrete single pile per footing 1500 mm dia. as per drawing No. <b>NPP-03C-2019/K2K3PQMTL/ICC/012</b> (including steel liner/casing), if required. |            |    |  |  |  |
|  | (i)   | Pile shaft upto depth of 20 m                                                                                                                                  | Lin.mtr    | 80 |  |  |  |
|  | (ii)  | Pile shaft depth 20 - 30 m                                                                                                                                     | Lin.mtr    | 40 |  |  |  |
|  | (iii) | Pile shaft depth 30 - 35 m                                                                                                                                     | Lin.mtr    | 20 |  |  |  |
|  | D-2   | Pile load test in compression confirming to ASTM D1143 / D1143M and in uplift confirming to ASTM D3689 / D3689M at 2.5 times of tower foundation loads         |            |    |  |  |  |
|  |       |                                                                                                                                                                |            |    |  |  |  |
|  | (a)   | DS1 (In Compression)                                                                                                                                           | Pile       | 1  |  |  |  |
|  | (b)   | DS1 (In Tension/Uplift)                                                                                                                                        | Pile       | 1  |  |  |  |
|  | (c)   | DA1 (In Compression)                                                                                                                                           | Pile       | 1  |  |  |  |
|  | (d)   | DA1 (In Tension/Uplift)                                                                                                                                        | Pile       | 1  |  |  |  |
|  | (e)   | Reinforced concrete single Test pile per footing 900 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G014</b> (including steel liner/casing), if required.  |            | 2  |  |  |  |
|  | (vi)  | DA1 (In Tension )                                                                                                                                              | Foundation |    |  |  |  |
|  | (vii) | DD1 (In Tension )                                                                                                                                              | Foundation |    |  |  |  |
|  | (i)   | Pile shaft upto depth of 20 m                                                                                                                                  | Lin.mtr    | 40 |  |  |  |
|  | (ii)  | Pile shaft depth 20 - 25 m                                                                                                                                     | Lin.mtr    | 10 |  |  |  |
|  | (f)   | Reinforced concrete single Test pile per footing 1200 mm dia. as per drawing No. <b>4029/169/TLC-</b>                                                          |            | 2  |  |  |  |



|          |     |       |                                                                                                                                                                                                                                                                                 |                    |       |  |  |  |
|----------|-----|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|--|--|--|
|          |     |       | <b>22/TD/01G015</b> (including steel liner/casing), if required.                                                                                                                                                                                                                |                    |       |  |  |  |
|          |     | (i)   | Pile shaft upto depth of 20 m                                                                                                                                                                                                                                                   | Lin.mtr            | 40    |  |  |  |
|          |     | (ii)  | Pile shaft depth 20 - 30 m                                                                                                                                                                                                                                                      | Lin.mtr            | 20    |  |  |  |
|          |     | (iii) | Pile shaft depth 30 - 35 m                                                                                                                                                                                                                                                      | Lin.mtr            | 10    |  |  |  |
|          | D-6 |       | Sonic Integrity Test at pile foundation confirming to ASTM D5882                                                                                                                                                                                                                | No.                | 70    |  |  |  |
|          |     |       | <b>Sub-Total D:</b>                                                                                                                                                                                                                                                             |                    |       |  |  |  |
| <b>E</b> |     |       | <b><u>Erection of Steel Towers</u></b>                                                                                                                                                                                                                                          |                    |       |  |  |  |
| 1        |     |       | Transport and Install 500kV double circuit tower types 'DS1', 'DA1', 'DD1' & TDT with all accessories i.e anti climbing devices, aerial markers number plates, danger signs, phase plates, Bird Guards etc. in accordance with requirements of Bidding Documents                | Ton                | 2,922 |  |  |  |
| 2        |     |       | Welding of erected tower bolts & nuts after final inspection upto height of 8.0 m from top of foundation chimney as per specification drawing                                                                                                                                   | Each tower         | 89    |  |  |  |
|          |     |       | <b>Sub-Total E:</b>                                                                                                                                                                                                                                                             |                    |       |  |  |  |
| <b>F</b> |     |       | <b><u>Stringing of Conductor and OPGW</u></b>                                                                                                                                                                                                                                   |                    |       |  |  |  |
| 1        |     |       | Transport & Install 795KCM ACSR Drake for quad conductor configuration insulator hanging, hardware assemblies, accessories & dampers etc. complete in all respects as per specifications & approved drawings and methodology.                                                   | km D/C Quad Bundle | 29    |  |  |  |
| 2        |     |       | Transport & Install OPGW including installation of drop down lengths for joint boxes at the towers along with allied hardware material including hardware assemblies, joint boxes accessories, dampers etc. complete in all respects as per specifications & approved drawings. | km (on Both Peaks) | 29    |  |  |  |
|          |     |       | <b>Sub-Total F:</b>                                                                                                                                                                                                                                                             |                    |       |  |  |  |
| <b>G</b> |     |       | <b><u>Testing &amp; Commissioning</u></b>                                                                                                                                                                                                                                       |                    |       |  |  |  |

|          |                                                                                                                                      |         |      |  |  |   |
|----------|--------------------------------------------------------------------------------------------------------------------------------------|---------|------|--|--|---|
| 1        | Testing and commissioning of the line                                                                                                | Lumpsum | 1    |  |  |   |
|          | <b>Sub-Total G:</b>                                                                                                                  |         |      |  |  |   |
| <b>H</b> | <b><u>ENVIRONMENTAL AND SOCIAL SAFEGUARDS</u></b>                                                                                    |         |      |  |  |   |
| 1        | Tree Plantation (Minimum height 4 feet)                                                                                              | No.     | 3000 |  |  |   |
| 2        | Water quality monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route. | No.     | 28   |  |  |   |
| 3        | Ambient Air monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route.   | No.     | 28   |  |  |   |
| 4        | Noise monitoring / analysis / measurement on quarterly basis for the whole project period at three locations along the TL route.     | No.     | 28   |  |  |   |
|          | <b>Sub-Total H:</b>                                                                                                                  |         |      |  |  | - |
|          |                                                                                                                                      |         |      |  |  |   |
| <b>I</b> | <b><u>INSTALLATION SERVICES FOR ADDITIONAL WORK</u></b>                                                                              |         |      |  |  |   |
| 1        | Grading/Cutting/Excavation (Dry Soil)                                                                                                | Cu. m.  | 60   |  |  |   |
| 2        | Excavation (semi-submerged soil)                                                                                                     | Cu. m.  | 40   |  |  |   |
| 3        | Excavation (submerged soil)                                                                                                          | Cu. m.  | 40   |  |  |   |
| 4        | Blasting/Cutting/Excavation/Grading (boulder/Rock)                                                                                   | Cu. m.  | 50   |  |  |   |
| 5        | Concrete (3000 psi at 28 days) furnished and installed                                                                               | Cu. m.  | 100  |  |  |   |
| 6        | Concrete (4000 psi at 28 days) furnished and installed                                                                               | Cu. m.  | 25   |  |  |   |
| 7        | Reinforcing Bars furnished and installed (Grade-60)                                                                                  | kg      | 1000 |  |  |   |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                             |           |     |  |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------|-----|--|--|--|
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Overhaul from Borrow and Compaction (regardless of the distance for borrow) | Cu. m.    | 100 |  |  |  |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Lean concrete furnished and installed (2000 psi strength at 28 days)        | Cu. m.    | 70  |  |  |  |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Compacted crush+sand (50:50 ratio) installed under footings                 | Cu. m.    | 50  |  |  |  |
| 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Bitumen coating for footing                                                 | Sq. m     | 50  |  |  |  |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Compacted Backfill                                                          | Cu. m.    | 100 |  |  |  |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Steel Casing/Liner (steel sheet thickness- 8mm) Diameter 1250mm             | Lin. Mtrs | 75  |  |  |  |
| 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Steel Casing/Liner (steel sheet thickness- 8mm) Diameter 1550mm             | Lin. Mtrs | 25  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Sub-Total I:</b>                                                         |           |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Total of Item A</b>                                                      |           |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Total of Item B</b>                                                      |           |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Total of Item C</b>                                                      |           |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Total of Item D</b>                                                      |           |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Total of Item E</b>                                                      |           |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Total of Item F</b>                                                      |           |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Total of Item G</b>                                                      |           |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Total of Item H</b>                                                      |           |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Total of Item I</b>                                                      |           |     |  |  |  |
| <b>Total (Column 6) to be carried forward to Grand Summary</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                             |           |     |  |  |  |
| <p><b><u>Notes:</u></b></p> <ol style="list-style-type: none"> <li>The quantities mentioned in the BOQ are estimated quantities. These quantities are to be used for bid evaluation purpose only. The actual quantities may vary depending upon detailed engineering and approved drawings. However, the unit rates for material and service quoted in the BOQ/ bid shall remain firm and final if design is unchanged.</li> <li>Price of any other item specifically not covered in the Price Schedules but is required for the completion, commissioning and operation of the transmission line shall be deemed to be included in the Price Schedules.</li> </ol> |                                                                             |           |     |  |  |  |

- 3 In case of failure by the bidder to fill the price of Sales Tax in relevant column, the quoted price of the bidder will be considered inclusive of Sales Tax applicable as per Lax and relevant provisions of the Bidding Documents. In case the bidder takes deviation or mention that prices are exclusive of PST, his bid shall be considered as non-responsive.
- 4 Foundation means four legs of tower.
- 5 An allowance of two percent (2%) of the total installed quantity will be permitted for sag, jumpers and wastage for the conductor, one percent (1%) for OPGW and two percent (2%) for lossage of nuts, bolts and washers (for towers only); and one percent (1%) for insulator breakage. These allowances are the maximum permissible and in case of wastage less than these limits all excess material shall be returned to NGC storage yards by the Contractor. For quantities in excess of these limits, the Contractor shall replace or reimburse NGC for the loss. All unused, above allowable limits of waste materials and packing wood are the property of NGC and shall be returned to NGC storage yards by the Contractor.
- 6 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.
- 7 The Bidder shall quote prices against all items, including those for which the specified quantity is "0". No item shall be left blank or unpriced in the Price Schedule.
- 8 Pile Foundation design will be release after the submission of Pile load test Report.
- 9 Location for Sonic Integrity and sonic integrity test report approval will be accorded by the office of DG (C&SE) NGC.

**Name of  
Bidder**

**Signature  
of Bidder**

| <b>Design, Manufacture, Procurement, Supply, Laying, Installation, Testing &amp; Commissioning of 500 kV<br/>Transmission Lines for C-5 Power Evacuation Scheme<br/>Lot-V: 500 kV D/C C5-Ludewala —Section C (Approx. 29 km)</b> |                                                                                                  |                               |                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------|
| <b><u>SCHEDULE NO. 5 - GRAND SUMMARY</u></b>                                                                                                                                                                                     |                                                                                                  |                               |                                   |
| Sr.<br>No.                                                                                                                                                                                                                       | Description                                                                                      | Bid Prices                    |                                   |
|                                                                                                                                                                                                                                  |                                                                                                  | Foreign Currency<br>Component | Local Currency<br>Component (PKR) |
| 1                                                                                                                                                                                                                                | Total Schedule No. 1 Plant and Mandatory Spare Parts Supplied from Abroad                        |                               |                                   |
| 2                                                                                                                                                                                                                                | Total Schedule No. 2 Plant and Mandatory Spare Parts Supplied from Within the Employer's Country |                               |                                   |
| 3                                                                                                                                                                                                                                | Total Schedule No. 3 Design Services                                                             |                               |                                   |
| 4                                                                                                                                                                                                                                | Total Schedule No. 4 Installation and Other Services                                             |                               |                                   |
| 5                                                                                                                                                                                                                                | Provisional Sum                                                                                  |                               | 1,700 Million                     |
| <b>GRAND TOTAL to be carried forward to Letter of Price Bid</b>                                                                                                                                                                  |                                                                                                  |                               |                                   |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

- 1 Specify the currency in accordance with ITB 12 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-V: 500 kV D/C C5-Ludewala – Section C (Approx. 29 km)**

**Schedule No. 6 - Recommended Spare Parts**

| Item | Description    | Qty | Unit Price                              |                                                 | Total Price                  |                                |
|------|----------------|-----|-----------------------------------------|-------------------------------------------------|------------------------------|--------------------------------|
|      |                |     | EXW<br>Local Parts<br>Local<br>Currency | CIP<br>Imported<br>Parts<br>Foreign<br>Currency | Local<br>Currency<br>Portion | Foreign<br>Currency<br>Portion |
| 1    | 2              | 3   | 4                                       | 5                                               | 6 = 3 x 4                    | 7 = 3 x 5                      |
|      | NOT APPLICABLE |     |                                         |                                                 |                              |                                |
|      |                |     |                                         |                                                 |                              |                                |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

## **Schedules of Rates and Prices**

### **(LOT-VI)**

| Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme |                                                                                                                                                                                                                                                                                                                                                           |                  |                            |      |          |                                   |           |                                    |           |                             |                                |          |                |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------|------|----------|-----------------------------------|-----------|------------------------------------|-----------|-----------------------------|--------------------------------|----------|----------------|
| Lot-VI: 500 kV D/C C5-Ludewala —Section D (Approx. 32 km)                                                                                            |                                                                                                                                                                                                                                                                                                                                                           |                  |                            |      |          |                                   |           |                                    |           |                             |                                |          |                |
| SCHEDULE NO.1- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM ABROAD                                                                                  |                                                                                                                                                                                                                                                                                                                                                           |                  |                            |      |          |                                   |           |                                    |           |                             |                                |          |                |
| Item No.                                                                                                                                             | Description                                                                                                                                                                                                                                                                                                                                               |                  | Code Country of Origin     | Unit | Quantity | Unit Price (CIF Pakistan Seaport) |           | Total Price (CIF Pakistan Seaport) |           | Total Inland Transportation | Total Price CIP (Project Site) |          | Taxes & Duties |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                           |                  |                            |      |          | CFR                               | Insurance | CFR                                | Insurance |                             | FCC                            | LCC      | Local Currency |
| 1                                                                                                                                                    | 2                                                                                                                                                                                                                                                                                                                                                         |                  | 3                          | 4    | 5        | 6                                 | 7         | 8=5 x 6                            | 9 = 5 x 7 | 10                          | 11=8                           | 12= 9+10 | 13             |
|                                                                                                                                                      | 500kV Double Circuit Transmission Line                                                                                                                                                                                                                                                                                                                    |                  |                            |      |          |                                   |           |                                    |           |                             |                                |          |                |
| A                                                                                                                                                    | Steel Towers                                                                                                                                                                                                                                                                                                                                              |                  |                            |      |          |                                   |           |                                    |           |                             |                                |          |                |
| 1                                                                                                                                                    | Furnish 500 kV double circuit towers DS1, DA1, DD1 & TDT and Single circuit tower type DGM alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                  |                            |      |          |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      | (a)                                                                                                                                                                                                                                                                                                                                                       | Tower Type "DS1" |                            |      |          |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                           | (i)              | Basic Tower Body           | No.  | 67       |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                           | (ii)             | 2.0 m Single Leg Extension | No.  | -        |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                           | (iii)            | 4.0 m Single Leg Extension | No.  | 40       |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                           | (iv)             | 6.0 m Single Leg Extension | No.  | 52       |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                           | (v)              | 8.0 m Single Leg Extension | No.  | 176      |                                   |           |                                    |           |                             |                                |          |                |



|     |                         |                            |     |     |  |  |  |  |  |  |  |  |  |
|-----|-------------------------|----------------------------|-----|-----|--|--|--|--|--|--|--|--|--|
|     | (vi)                    | 6.0 m Body Extension       | No. | 14  |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 268 |  |  |  |  |  |  |  |  |  |
| (b) | <u>Tower Type "DA1"</u> |                            |     |     |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 12  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 2.0 m Single Leg Extension | No. | -   |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 4.0 m Single Leg Extension | No. | 4   |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 6.0 m Single Leg Extension | No. | 8   |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 8.0 m Single Leg Extension | No. | 36  |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 6.0 m Body Extension       | No. | 1   |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 48  |  |  |  |  |  |  |  |  |  |
| (c) | <u>Tower Type "DD1"</u> |                            |     |     |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 19  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 2.0 m Single Leg Extension | No. | 8   |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 4.0 m Single Leg Extension | No. | 8   |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 6.0 m Single Leg Extension | No. | 48  |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 8.0 m Single Leg Extension | No. | 20  |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 6.0 m Body Extension       | No. | 6   |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 76  |  |  |  |  |  |  |  |  |  |
| (d) | <u>Tower Type "DGM"</u> |                            |     |     |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 4   |  |  |  |  |  |  |  |  |  |

|                      |                                                              |                                                    |     |       |  |  |  |  |  |  |  |  |  |
|----------------------|--------------------------------------------------------------|----------------------------------------------------|-----|-------|--|--|--|--|--|--|--|--|--|
|                      | (ii)                                                         | 3.1 m Single Leg Extension                         | No. | 16    |  |  |  |  |  |  |  |  |  |
|                      | (iii)                                                        | Stubs                                              | No. | 16    |  |  |  |  |  |  |  |  |  |
| (e)                  | <u>Tower Type "TDT"</u>                                      |                                                    |     |       |  |  |  |  |  |  |  |  |  |
|                      | (i)                                                          | Basic Tower Body                                   | No. | 1     |  |  |  |  |  |  |  |  |  |
|                      | (ii)                                                         | 8.0 m Single Leg Extension                         | No. | 4     |  |  |  |  |  |  |  |  |  |
|                      | (iii)                                                        | Stubs                                              | No. | 4     |  |  |  |  |  |  |  |  |  |
| <b>Sub-Total A :</b> |                                                              |                                                    |     |       |  |  |  |  |  |  |  |  |  |
| <b>B</b>             | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                                                    |     |       |  |  |  |  |  |  |  |  |  |
| 1                    | Furnish 795 KCM ACSR "Drake" Conductor                       |                                                    | km  | 784   |  |  |  |  |  |  |  |  |  |
| 2                    | Furnish                                                      |                                                    |     |       |  |  |  |  |  |  |  |  |  |
|                      | (a)                                                          | OPGW with at least 24 fibers                       | km  | 75    |  |  |  |  |  |  |  |  |  |
|                      | (b)                                                          | Joint boxes for OPGW                               |     |       |  |  |  |  |  |  |  |  |  |
|                      | (i)                                                          | OPGW-OPGW (A Type)                                 | No. | 15    |  |  |  |  |  |  |  |  |  |
|                      | (ii)                                                         | OPGW-OPGW Cable ( B Type)                          | No. | 3     |  |  |  |  |  |  |  |  |  |
|                      | (iii)                                                        | OPGW-attaching Clamps                              | No. | 1,080 |  |  |  |  |  |  |  |  |  |
|                      | (iv)                                                         | Fibre Optic Approach Cable                         | km  | 6     |  |  |  |  |  |  |  |  |  |
|                      | (c)                                                          | Test Equipment, Installation and Maintenance Tools |     | -     |  |  |  |  |  |  |  |  |  |
|                      | -                                                            | Fiber Optic Talk Set (Set comprised two units)     | Set | 1     |  |  |  |  |  |  |  |  |  |

|                      |                                                                                                                                                                                                                                                                    |                                                                      |     |     |  |  |  |  |  |  |  |  |  |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----|-----|--|--|--|--|--|--|--|--|--|
|                      | -                                                                                                                                                                                                                                                                  | Fiber Optic Tool Kit                                                 | Set | 1   |  |  |  |  |  |  |  |  |  |
|                      | -                                                                                                                                                                                                                                                                  | OTDR with range $\geq 400\text{km}$<br>Yokogawa AQ7260 or equivalent | Set | 1   |  |  |  |  |  |  |  |  |  |
| <b>Sub Total B :</b> |                                                                                                                                                                                                                                                                    |                                                                      |     |     |  |  |  |  |  |  |  |  |  |
| <b>C</b>             | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                                       |                                                                      |     |     |  |  |  |  |  |  |  |  |  |
| 1                    | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001                  |                                                                      | Set | 402 |  |  |  |  |  |  |  |  |  |
| 2                    | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002           |                                                                      | Set | 186 |  |  |  |  |  |  |  |  |  |
| 3                    | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005 |                                                                      | Set | 372 |  |  |  |  |  |  |  |  |  |
| 4                    | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'DGM' as per specification drawing No. NTDC/DESIGN/01E153                        |                                                                      | Set | 4   |  |  |  |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                                                                                                      |  |     |    |  |  |  |  |  |  |  |  |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|----|--|--|--|--|--|--|--|--|
| 5 | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004                                                                                     |  | Set | 8  |  |  |  |  |  |  |  |  |
| 6 | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower type 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005                                                                                                 |  | Set | 24 |  |  |  |  |  |  |  |  |
| 7 | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower type 'TDT' including Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing (Note: No. of Insulators in each arm/string = 29 Nos.) as per specification drawing No. 4029/169/401C/TD/01E005a |  | Set | 8  |  |  |  |  |  |  |  |  |
| 8 | Furnish Single string Transposition Assembly Upright type "TDTU(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E006 (Note: No. of Insulators in each arm/string = 36 Nos.)            |  | Set | 4  |  |  |  |  |  |  |  |  |
| 9 | Furnish Single string Transposition Assembly Inverted type "TDTI(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E007 (Note: No. of Insulators in each arm/string = 36 Nos.)           |  | Set | 4  |  |  |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                                                                      |  |     |    |  |  |  |  |  |  |  |  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|----|--|--|--|--|--|--|--|--|
| 10 | Furnish Quad string special dead end assemblies type "SDE(4)" for Pre-RTV Coated 160kN E&M strength insulators for tower type "TDT" as per specification drawing No. 4029/169/401C/TD/01E008<br>(Note: No. of Insulators in each arm/string = 29 Nos.)                               |  | Set | 4  |  |  |  |  |  |  |  |  |
| 11 | Furnish Pipe Jumper Assembly type "VJT(4)" for Pre-RTV Coated 80kN E&M strength insulators for tower type "TDT" including jumper spacers & special jumper spacers as per specification drawing No. 4029/169/401C/TD/01E009<br>(Note: No. of Insulators in each arm/string = 54 Nos.) |  | Set | 4  |  |  |  |  |  |  |  |  |
| 12 | Furnish Special Tension Clamp for tower type "TDT" as per specification                                                                                                                                                                                                              |  | Set | 16 |  |  |  |  |  |  |  |  |
| 13 | Furnish Jumper Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                                                                  |  | Set | 64 |  |  |  |  |  |  |  |  |
| 14 | Furnish Straight Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                                                                |  | Set | 16 |  |  |  |  |  |  |  |  |
| 15 | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                                   |  | Set | 6  |  |  |  |  |  |  |  |  |
| 16 | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                                  |  | Set | 6  |  |  |  |  |  |  |  |  |

|                      |                                                                                                                                                                                |         |       |  |  |  |  |  |  |  |  |  |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------|--|--|--|--|--|--|--|--|--|
| 17                   | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assemblies (items C1 - 11 & C15-16) with Coulomb or ElecNET software. | Lumpsum | 1     |  |  |  |  |  |  |  |  |  |
| <b>Sub-Total C :</b> |                                                                                                                                                                                |         |       |  |  |  |  |  |  |  |  |  |
| <b>D</b>             | <b><u>Hardware for OPGW</u></b>                                                                                                                                                |         |       |  |  |  |  |  |  |  |  |  |
| 1                    | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                          | Set     | 134   |  |  |  |  |  |  |  |  |  |
| 2                    | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                                   | Set     | 15    |  |  |  |  |  |  |  |  |  |
| 3                    | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                      | Set     | 68    |  |  |  |  |  |  |  |  |  |
| <b>Sub-Total D :</b> |                                                                                                                                                                                |         |       |  |  |  |  |  |  |  |  |  |
| <b>E</b>             | <b><u>Accessories and Dampers</u></b>                                                                                                                                          |         |       |  |  |  |  |  |  |  |  |  |
| 1                    | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                       | No.     | 270   |  |  |  |  |  |  |  |  |  |
| 2                    | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                            | No.     | 135   |  |  |  |  |  |  |  |  |  |
| 3                    | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor.       | No.     | 1,795 |  |  |  |  |  |  |  |  |  |
| 4                    | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                      | No.     | 4,493 |  |  |  |  |  |  |  |  |  |
| 5                    | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor (See Note-3)                                                                                        | No.     | 1,123 |  |  |  |  |  |  |  |  |  |
| 6                    | Furnish stock bridge vibration dampers for OPGW.                                                                                                                               | No.     | 554   |  |  |  |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                                                                                        |                         |                            |  |       |     |  |  |  |  |  |  |  |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------|--|-------|-----|--|--|--|--|--|--|--|
|          | <b>Sub-Total E :</b>                                                                                                                                                                                                                                                                                                   |                         |                            |  |       |     |  |  |  |  |  |  |  |
| <b>F</b> | <b><u>Grounding Material</u></b>                                                                                                                                                                                                                                                                                       |                         |                            |  |       |     |  |  |  |  |  |  |  |
| 1        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                                                                                                                                                                          |                         |                            |  | No.   | 206 |  |  |  |  |  |  |  |
| 2        | Furnish flat to cable connector.                                                                                                                                                                                                                                                                                       |                         |                            |  | No.   | 206 |  |  |  |  |  |  |  |
| 3        | Furnish cable to rod connector.                                                                                                                                                                                                                                                                                        |                         |                            |  | No.   | 206 |  |  |  |  |  |  |  |
| 4        | Furnish 7 No. 10 copper covered ground wire.                                                                                                                                                                                                                                                                           |                         |                            |  | Meter | 618 |  |  |  |  |  |  |  |
|          | <b>Sub-Total F :</b>                                                                                                                                                                                                                                                                                                   |                         |                            |  |       |     |  |  |  |  |  |  |  |
| <b>G</b> | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                                                                                                                                                                    |                         |                            |  |       |     |  |  |  |  |  |  |  |
| <b>1</b> | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                                             |                         |                            |  |       |     |  |  |  |  |  |  |  |
|          | Furnish 500kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                         |                            |  |       |     |  |  |  |  |  |  |  |
|          | (a)                                                                                                                                                                                                                                                                                                                    | <u>Tower Type "DS1"</u> |                            |  |       |     |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (i)                     | Basic Tower Body           |  | No.   | 7   |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (ii)                    | 2.0 m Single Leg Extension |  | No.   | 4   |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (iii)                   | 4.0 m Single Leg Extension |  | No.   | 8   |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (iv)                    | 6.0 m Single Leg Extension |  | No.   | 4   |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (v)                     | 8.0 m Single Leg Extension |  | No.   | 16  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                                        | (vi)                    | 6.0 m Body Extension       |  | No.   | 1   |  |  |  |  |  |  |  |

|     |                         |                            |     |    |  |  |  |  |  |  |  |  |  |
|-----|-------------------------|----------------------------|-----|----|--|--|--|--|--|--|--|--|--|
|     | (vii)                   | Stubs                      | No. | 32 |  |  |  |  |  |  |  |  |  |
| (b) | <u>Tower Type "DA1"</u> |                            |     |    |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 3  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 2.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 4.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 6.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 8.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 6.0 m Body Extension       | No. | 1  |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 12 |  |  |  |  |  |  |  |  |  |
| (c) | <u>Tower Type "DD1"</u> |                            |     |    |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 3  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 2.0 m Single Leg Extension | No. | 8  |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 4.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 6.0 m Single Leg Extension | No. | 8  |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 8.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 6.0 m Body Extension       | No. | 1  |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | Stubs                      | No. | 12 |  |  |  |  |  |  |  |  |  |
| (d) | <u>Tower Type "DGM"</u> |                            |     |    |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 1  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 3.1 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |  |



|     |                                                                                                                                                                                                                                                   |                              |     |       |  |  |  |  |  |  |  |  |  |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----|-------|--|--|--|--|--|--|--|--|--|
|     | (iii)                                                                                                                                                                                                                                             | Stubs                        | No. | 4     |  |  |  |  |  |  |  |  |  |
| (d) | <u>Tower Type "TDT"</u>                                                                                                                                                                                                                           |                              |     |       |  |  |  |  |  |  |  |  |  |
|     | (i)                                                                                                                                                                                                                                               | Basic Tower Body             | No. | -     |  |  |  |  |  |  |  |  |  |
|     | (ii)                                                                                                                                                                                                                                              | 6.0 m Single Leg Extension   | No. | -     |  |  |  |  |  |  |  |  |  |
|     | (iii)                                                                                                                                                                                                                                             | Stubs                        | No. | -     |  |  |  |  |  |  |  |  |  |
|     | <b><u>Conductor and OPGW (With Associated Equipment)</u></b>                                                                                                                                                                                      |                              |     |       |  |  |  |  |  |  |  |  |  |
| 2   | Furnish 795 KCM ACSR "Drake" Conductor                                                                                                                                                                                                            |                              | km  | 76.80 |  |  |  |  |  |  |  |  |  |
| 3   | Furnish                                                                                                                                                                                                                                           |                              |     |       |  |  |  |  |  |  |  |  |  |
|     | (a)                                                                                                                                                                                                                                               | OPGW with at least 24 fibers | km  | 10    |  |  |  |  |  |  |  |  |  |
|     | (b)                                                                                                                                                                                                                                               | Joint boxes for OPGW         |     |       |  |  |  |  |  |  |  |  |  |
|     | (i)                                                                                                                                                                                                                                               | OPGW-OPGW (A Type)           | No. | 2     |  |  |  |  |  |  |  |  |  |
|     | (ii)                                                                                                                                                                                                                                              | OPGW-OPGW Cable ( B Type)    | No. | -     |  |  |  |  |  |  |  |  |  |
|     | (iii)                                                                                                                                                                                                                                             | OPGW-attaching Clamps        | No. | 120   |  |  |  |  |  |  |  |  |  |
|     | (iv)                                                                                                                                                                                                                                              | Fibre Optic Approach Cable   | km  | -     |  |  |  |  |  |  |  |  |  |
|     | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                      |                              |     |       |  |  |  |  |  |  |  |  |  |
| 4   | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001 |                              | Set | 42    |  |  |  |  |  |  |  |  |  |
| 5   | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per                                            |                              | Set | 36    |  |  |  |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                                                    |  |     |    |  |  |  |  |  |  |  |  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|----|--|--|--|--|--|--|--|--|
|    | specification drawing No.<br>4029/169/401C/TD/01E002                                                                                                                                                                                                               |  |     |    |  |  |  |  |  |  |  |  |
| 6  | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005 |  | Set | 72 |  |  |  |  |  |  |  |  |
| 7  | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'DGM' as per specification drawing No. NTDC/DESIGN/01E153                        |  | Set | 1  |  |  |  |  |  |  |  |  |
| 8  | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004                   |  | Set | 2  |  |  |  |  |  |  |  |  |
| 9  | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower type 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005                               |  | Set | 6  |  |  |  |  |  |  |  |  |
| 10 | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                 |  | Set | 6  |  |  |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                                     |     |     |  |  |  |  |  |  |  |  |  |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|--|--|--|--|--|--|--|--|--|
| 11 | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011 | Set | 6   |  |  |  |  |  |  |  |  |  |
|    | <b><u>Hardware for OPGW</u></b>                                                                                                                                                                                                                     |     |     |  |  |  |  |  |  |  |  |  |
| 12 | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                               | Set | 14  |  |  |  |  |  |  |  |  |  |
| 13 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                                                                                                        | Set | 2   |  |  |  |  |  |  |  |  |  |
| 14 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                                                                                           | Set | 13  |  |  |  |  |  |  |  |  |  |
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                                                                                               |     |     |  |  |  |  |  |  |  |  |  |
| 15 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                                                                                            | No. | 26  |  |  |  |  |  |  |  |  |  |
| 16 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                                                                                                 | No. | 13  |  |  |  |  |  |  |  |  |  |
| 17 | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor.                                                                            | No. | 396 |  |  |  |  |  |  |  |  |  |
| 18 | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                                                                                           | No. | 650 |  |  |  |  |  |  |  |  |  |
| 19 | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor                                                                                                                                                                          | No. | 162 |  |  |  |  |  |  |  |  |  |
| 20 | Furnish stock bridge vibration dampers for OPGW.                                                                                                                                                                                                    | No. | 83  |  |  |  |  |  |  |  |  |  |
|    | <b><u>Grounding Material</u></b>                                                                                                                                                                                                                    |     |     |  |  |  |  |  |  |  |  |  |

|                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |       |    |  |  |  |  |  |  |  |   |
|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------|----|--|--|--|--|--|--|--|---|
| 18                                                                       | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                                                                                                                                                                                                                                                                                                          |  | No.   | 28 |  |  |  |  |  |  |  |   |
| 19                                                                       | Furnish flat to cable connector.                                                                                                                                                                                                                                                                                                                                                                                                                       |  | No.   | 28 |  |  |  |  |  |  |  |   |
| 20                                                                       | Furnish cable to rod connector.                                                                                                                                                                                                                                                                                                                                                                                                                        |  | No.   | 28 |  |  |  |  |  |  |  |   |
| 21                                                                       | Furnish 7 No. 10 copper covered ground wire.                                                                                                                                                                                                                                                                                                                                                                                                           |  | Meter | 84 |  |  |  |  |  |  |  |   |
|                                                                          | Sub-Total of G :                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |       |    |  |  |  |  |  |  |  | - |
|                                                                          | Total of Item A                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |       |    |  |  |  |  |  |  |  | - |
|                                                                          | Total of Item B                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |       |    |  |  |  |  |  |  |  | - |
|                                                                          | Total of Item C                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |       |    |  |  |  |  |  |  |  | - |
|                                                                          | Total of Item D                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |       |    |  |  |  |  |  |  |  | - |
|                                                                          | Total of Item E                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |       |    |  |  |  |  |  |  |  | - |
|                                                                          | Total of Item F                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |       |    |  |  |  |  |  |  |  | - |
|                                                                          | Total of Item G                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |       |    |  |  |  |  |  |  |  | - |
| Grand Total of column No. 11 & 12 to be carried forward to Grand summary |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |       |    |  |  |  |  |  |  |  | - |
|                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |       |    |  |  |  |  |  |  |  |   |
| * The Bidder shall specify the type of insulator being offered.          |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |       |    |  |  |  |  |  |  |  |   |
| Notes:                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |       |    |  |  |  |  |  |  |  |   |
| 1                                                                        | Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types DS1, DA1, DD1, DGM, and TDT, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly. |  |       |    |  |  |  |  |  |  |  |   |
| 2                                                                        | The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.                                                                                                                                                                                                                                                                                                    |  |       |    |  |  |  |  |  |  |  |   |

- 3 The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.
- 4 The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.
- 5 The bidder shall be responsible to furnish the tower material, OPGW, conductor, insulators, accessories, dampers & hardware for conductor and OPGW, for completion of line in all respect. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.
- 6 The contractor shall transport, unload and stack leftover/additional material from site to NGC designated Warehouse/Store at its own cost.
- 7 Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.
- 8 The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully before filling up the schedule of prices.
- 9 Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.
- 10 Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.
- 11 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.

**Signature  
of Bidder**

| Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines<br>for C-5 Power Evacuation Scheme<br>Lot-VI: 500 kV D/C C5-Ludewala —Section D (Approx. 32 km) |                                                                                                                                                                                                                                                                                                                                                           |                                  |      |          |                |           |                 |                             |                |                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|------|----------|----------------|-----------|-----------------|-----------------------------|----------------|--------------------------------------|
| SCHEDULE NO.2- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM WITHIN PAKISTAN                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                           |                                  |      |          |                |           |                 |                             |                |                                      |
| Item No.                                                                                                                                                                                                             | Description                                                                                                                                                                                                                                                                                                                                               |                                  | Unit | Quantity | Unit Price     |           | Total EXW Price | Total Inland Transportation | Total Price    | Sales and other Taxes & Duties (PKR) |
|                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                           |                                  |      |          | Local Currency | EXW Price |                 |                             | Local Currency |                                      |
| 1                                                                                                                                                                                                                    | 2                                                                                                                                                                                                                                                                                                                                                         |                                  | 3    | 4        | 5              | 6         | 7 = 4 x 6       | 8                           | 9 = 7+ 8       | 10                                   |
|                                                                                                                                                                                                                      | 500kV Double Circuit Transmission Line                                                                                                                                                                                                                                                                                                                    |                                  |      |          |                |           |                 |                             |                |                                      |
| A                                                                                                                                                                                                                    | Steel Towers                                                                                                                                                                                                                                                                                                                                              |                                  |      |          |                |           |                 |                             |                |                                      |
| 1                                                                                                                                                                                                                    | Furnish 500 kV double circuit towers DS1, DA1, DD1 & TDT and Single circuit tower type DGM alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                                  |      |          |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                      | (a)                                                                                                                                                                                                                                                                                                                                                       | Tower Type "DS1"                 |      |          |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                           | (i) Basic Tower Body             | No.  | 67       |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                           | (ii) 2.0 m Single Leg Extension  | No.  | -        |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                           | (iii) 4.0 m Single Leg Extension | No.  | 40       |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                           | (iv) 6.0 m Single Leg Extension  | No.  | 52       |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                           | (v) 8.0 m Single Leg Extension   | No.  | 176      |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                           | (vi) 6.0 m Body Extension        | No.  | 14       |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                           | (vii) Stubs                      | No.  | 268      |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                      | (b)                                                                                                                                                                                                                                                                                                                                                       | Tower Type "DA1"                 |      |          |                |           |                 |                             |                |                                      |

|          |                                                              |                            |     |     |  |  |  |  |  |  |
|----------|--------------------------------------------------------------|----------------------------|-----|-----|--|--|--|--|--|--|
|          | (i)                                                          | Basic Tower Body           | No. | 12  |  |  |  |  |  |  |
|          | (ii)                                                         | 2.0 m Single Leg Extension | No. | -   |  |  |  |  |  |  |
|          | (iii)                                                        | 4.0 m Single Leg Extension | No. | 4   |  |  |  |  |  |  |
|          | (iv)                                                         | 6.0 m Single Leg Extension | No. | 8   |  |  |  |  |  |  |
|          | (v)                                                          | 8.0 m Single Leg Extension | No. | 36  |  |  |  |  |  |  |
|          | (vi)                                                         | 6.0 m Body Extension       | No. | 1   |  |  |  |  |  |  |
|          | (vii)                                                        | Stubs                      | No. | 48  |  |  |  |  |  |  |
|          | (c)                                                          | <u>Tower Type "DD1"</u>    |     |     |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body           | No. | 19  |  |  |  |  |  |  |
|          | (ii)                                                         | 2.0 m Single Leg Extension | No. | 8   |  |  |  |  |  |  |
|          | (iii)                                                        | 4.0 m Single Leg Extension | No. | 8   |  |  |  |  |  |  |
|          | (iv)                                                         | 6.0 m Single Leg Extension | No. | 48  |  |  |  |  |  |  |
|          | (v)                                                          | 8.0 m Single Leg Extension | No. | 20  |  |  |  |  |  |  |
|          | (vi)                                                         | 6.0 m Body Extension       | No. | 6   |  |  |  |  |  |  |
|          | (vii)                                                        | Stubs                      | No. | 76  |  |  |  |  |  |  |
|          | (d)                                                          | <u>Tower Type "DGM"</u>    |     |     |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body           | No. | 4   |  |  |  |  |  |  |
|          | (ii)                                                         | 3.1 m Single Leg Extension | No. | 16  |  |  |  |  |  |  |
|          | (iii)                                                        | Stubs                      | No. | 16  |  |  |  |  |  |  |
|          | (e)                                                          | <u>Tower Type "TDT"</u>    |     |     |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body           | No. | 1   |  |  |  |  |  |  |
|          | (ii)                                                         | 8.0 m Single Leg Extension | No. | 4   |  |  |  |  |  |  |
|          | (iii)                                                        | Stubs                      | No. | 4   |  |  |  |  |  |  |
|          | <b>Sub-Total A :</b>                                         |                            |     |     |  |  |  |  |  |  |
| <b>B</b> | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                            |     |     |  |  |  |  |  |  |
| 1        | Furnish 795 KCM ACSR "Drake" Conductor                       |                            | km  | 784 |  |  |  |  |  |  |
| 2        | Furnish                                                      |                            |     |     |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                   |                                                                      |     |       |  |  |  |  |  |  |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----|-------|--|--|--|--|--|--|
|          | (a)                                                                                                                                                                                                                                               | OPGW with at least 24 fibers                                         | km  | 75    |  |  |  |  |  |  |
|          | (b)                                                                                                                                                                                                                                               | Joint boxes for OPGW                                                 |     |       |  |  |  |  |  |  |
|          | (i)                                                                                                                                                                                                                                               | OPGW-OPGW (A Type)                                                   | No. | 15    |  |  |  |  |  |  |
|          | (ii)                                                                                                                                                                                                                                              | OPGW-OPGW Cable ( B Type)                                            | No. | 3     |  |  |  |  |  |  |
|          | (iii)                                                                                                                                                                                                                                             | OPGW-attaching Clamps                                                | No. | 1,080 |  |  |  |  |  |  |
|          | (iv)                                                                                                                                                                                                                                              | Fibre Optic Approach Cable                                           | km  | 6     |  |  |  |  |  |  |
|          | (c)                                                                                                                                                                                                                                               | Test Equipment, Installation and Maintenance Tools                   |     | -     |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                 | Fiber Optic Talk Set (Set comprised two units)                       | Set | 1     |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                 | Fiber Optic Tool Kit                                                 | Set | 1     |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                 | OTDR with range $\geq 400\text{km}$<br>Yokogawa AQ7260 or equivalent | Set | 1     |  |  |  |  |  |  |
|          | <b>Sub Total B :</b>                                                                                                                                                                                                                              |                                                                      |     |       |  |  |  |  |  |  |
| <b>C</b> | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                      |                                                                      |     |       |  |  |  |  |  |  |
| 1        | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001 |                                                                      | Set | 402   |  |  |  |  |  |  |
| 2        | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per                                            |                                                                      | Set | 186   |  |  |  |  |  |  |



|   |                                                                                                                                                                                                                                                                                                                                      |     |     |  |  |  |  |  |  |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|--|--|--|--|--|--|
|   | specification drawing No.<br>4029/169/401C/TD/01E002                                                                                                                                                                                                                                                                                 |     |     |  |  |  |  |  |  |
| 3 | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005                                                                   | Set | 372 |  |  |  |  |  |  |
| 4 | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'DGM' as per specification drawing No. NTDC/DESIGN/01E153                                                                                          | Set | 4   |  |  |  |  |  |  |
| 5 | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004                                                                                     | Set | 8   |  |  |  |  |  |  |
| 6 | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower type 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005                                                                                                 | Set | 24  |  |  |  |  |  |  |
| 7 | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower type 'TDT' including Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing (Note: No. of Insulators in each arm/string = 29 Nos.) as per specification drawing No. 4029/169/401C/TD/01E005a | Set | 8   |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                                                                                                               |     |    |  |  |  |  |  |  |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|--|--|--|--|--|--|
| 8  | Furnish Single string Transposition Assembly Upright type "TDTU(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E006<br>(Note: No. of Insulators in each arm/string = 36 Nos.)  | Set | 4  |  |  |  |  |  |  |
| 9  | Furnish Single string Transposition Assembly Inverted type "TDTI(4)" for Pre-RTV Coated 80kN E&M strength insulators (Porcelain or Glass)* for tower type "TDT" including dead end clamp & Jumper Terminal as per specification drawing No. 4029/169/401C/TD/01E007<br>(Note: No. of Insulators in each arm/string = 36 Nos.) | Set | 4  |  |  |  |  |  |  |
| 10 | Furnish Quad string special dead end assemblies type "SDE(4)" for Pre-RTV Coated 160kN E&M strength insulators for tower type "TDT" as per specification drawing No. 4029/169/401C/TD/01E008<br>(Note: No. of Insulators in each arm/string = 29 Nos.)                                                                        | Set | 4  |  |  |  |  |  |  |
| 11 | Furnish Pipe Jumper Assembly type "VJT(4)" for Pre-RTV Coated 80kN E&M strength insulators for tower type "TDT" including jumper spacers & special jumper spacers as per specification drawing No. 4029/169/401C/TD/01E009<br>(Note: No. of Insulators in each arm/string = 54 Nos.)                                          | Set | 4  |  |  |  |  |  |  |
| 12 | Furnish Special Tension Clamp for tower type "TDT" as per specification                                                                                                                                                                                                                                                       | Set | 16 |  |  |  |  |  |  |

|                      |                                                                                                                                                                                                                                                     |         |     |  |  |  |  |  |  |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|--|--|--|--|--|--|
| 13                   | Furnish Jumper Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                                 | Set     | 64  |  |  |  |  |  |  |
| 14                   | Furnish Straight Compression Dead End Clamp for tower type "TDT" as per specification                                                                                                                                                               | Set     | 16  |  |  |  |  |  |  |
| 15                   | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010  | Set     | 6   |  |  |  |  |  |  |
| 16                   | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011 | Set     | 6   |  |  |  |  |  |  |
| 17                   | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assembles (items C1 - 11 & C15-16) with Coulomb or ElecNET software.                                                                       | Lumpsum | 1   |  |  |  |  |  |  |
| <b>Sub-Total C :</b> |                                                                                                                                                                                                                                                     |         |     |  |  |  |  |  |  |
| <b>D</b>             | <b><u>Hardware for OPGW</u></b>                                                                                                                                                                                                                     |         |     |  |  |  |  |  |  |
| 1                    | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                                                                                               | Set     | 134 |  |  |  |  |  |  |
| 2                    | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                                                                                                        | Set     | 15  |  |  |  |  |  |  |
| 3                    | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                                                                                           | Set     | 68  |  |  |  |  |  |  |

|          |                                                                                                                                                                          |       |       |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|--|--|--|--|--|--|
|          | <b>Sub-Total D :</b>                                                                                                                                                     |       |       |  |  |  |  |  |  |
| <b>E</b> | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |       |       |  |  |  |  |  |  |
| 1        | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 | No.   | 270   |  |  |  |  |  |  |
| 2        | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      | No.   | 135   |  |  |  |  |  |  |
| 3        | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No.   | 1,795 |  |  |  |  |  |  |
| 4        | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No.   | 4,493 |  |  |  |  |  |  |
| 5        | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor (See Note-3)                                                                                  | No.   | 1,123 |  |  |  |  |  |  |
| 6        | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No.   | 554   |  |  |  |  |  |  |
|          | <b>Sub-Total E :</b>                                                                                                                                                     |       |       |  |  |  |  |  |  |
|          |                                                                                                                                                                          |       |       |  |  |  |  |  |  |
| <b>F</b> | <b><u>Grounding Material</u></b>                                                                                                                                         |       |       |  |  |  |  |  |  |
| 1        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            | No.   | 206   |  |  |  |  |  |  |
| 2        | Furnish flat to cable connector.                                                                                                                                         | No.   | 206   |  |  |  |  |  |  |
| 3        | Furnish cable to rod connector.                                                                                                                                          | No.   | 206   |  |  |  |  |  |  |
| 4        | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             | Meter | 618   |  |  |  |  |  |  |
|          | <b>Sub-Total F :</b>                                                                                                                                                     |       |       |  |  |  |  |  |  |
| <b>G</b> | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                      |       |       |  |  |  |  |  |  |
| <b>1</b> | <b><u>Steel Towers</u></b>                                                                                                                                               |       |       |  |  |  |  |  |  |
|          | Furnish 500kV double circuit towers DS1, DA1, DD1 & TDT alongwith accessories including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase      |       |       |  |  |  |  |  |  |

|  |     |                                                                                                                                                    |     |    |  |  |  |  |  |  |
|--|-----|----------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|--|--|--|--|--|--|
|  |     | plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |     |    |  |  |  |  |  |  |
|  | (a) | <u>Tower Type "DS1"</u>                                                                                                                            |     |    |  |  |  |  |  |  |
|  |     | (i) Basic Tower Body                                                                                                                               | No. | 7  |  |  |  |  |  |  |
|  |     | (ii) 2.0 m Single Leg Extension                                                                                                                    | No. | 4  |  |  |  |  |  |  |
|  |     | (iii) 4.0 m Single Leg Extension                                                                                                                   | No. | 8  |  |  |  |  |  |  |
|  |     | (iv) 6.0 m Single Leg Extension                                                                                                                    | No. | 4  |  |  |  |  |  |  |
|  |     | (v) 8.0 m Single Leg Extension                                                                                                                     | No. | 16 |  |  |  |  |  |  |
|  |     | (vi) 6.0 m Body Extension                                                                                                                          | No. | 1  |  |  |  |  |  |  |
|  |     | (vii) Stubs                                                                                                                                        | No. | 32 |  |  |  |  |  |  |
|  | (b) | <u>Tower Type "DA1"</u>                                                                                                                            |     |    |  |  |  |  |  |  |
|  |     | (i) Basic Tower Body                                                                                                                               | No. | 3  |  |  |  |  |  |  |
|  |     | (ii) 2.0 m Single Leg Extension                                                                                                                    | No. | 4  |  |  |  |  |  |  |
|  |     | (iii) 4.0 m Single Leg Extension                                                                                                                   | No. | 4  |  |  |  |  |  |  |
|  |     | (iv) 6.0 m Single Leg Extension                                                                                                                    | No. | 4  |  |  |  |  |  |  |
|  |     | (v) 8.0 m Single Leg Extension                                                                                                                     | No. | 4  |  |  |  |  |  |  |
|  |     | (vi) 6.0 m Body Extension                                                                                                                          | No. | 1  |  |  |  |  |  |  |
|  |     | (vii) Stubs                                                                                                                                        | No. | 12 |  |  |  |  |  |  |
|  | (c) | <u>Tower Type "DD1"</u>                                                                                                                            |     |    |  |  |  |  |  |  |
|  |     | (i) Basic Tower Body                                                                                                                               | No. | 3  |  |  |  |  |  |  |
|  |     | (ii) 2.0 m Single Leg Extension                                                                                                                    | No. | 8  |  |  |  |  |  |  |
|  |     | (iii) 4.0 m Single Leg Extension                                                                                                                   | No. | 4  |  |  |  |  |  |  |
|  |     | (iv) 6.0 m Single Leg Extension                                                                                                                    | No. | 8  |  |  |  |  |  |  |
|  |     | (v) 8.0 m Single Leg Extension                                                                                                                     | No. | 4  |  |  |  |  |  |  |
|  |     | (vi) 6.0 m Body Extension                                                                                                                          | No. | 1  |  |  |  |  |  |  |
|  |     | (vii) Stubs                                                                                                                                        | No. | 12 |  |  |  |  |  |  |
|  | (d) | <u>Tower Type "DGM"</u>                                                                                                                            |     |    |  |  |  |  |  |  |
|  |     | (i) Basic Tower Body                                                                                                                               | No. | 1  |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                          |                              |     |       |  |  |  |  |  |  |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----|-------|--|--|--|--|--|--|
|   | (ii)                                                                                                                                                                                                                                                     | 3.1 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |
|   | (iii)                                                                                                                                                                                                                                                    | Stubs                        | No. | 4     |  |  |  |  |  |  |
|   | (d)                                                                                                                                                                                                                                                      | <u>Tower Type "TDT"</u>      |     |       |  |  |  |  |  |  |
|   | (i)                                                                                                                                                                                                                                                      | Basic Tower Body             | No. | -     |  |  |  |  |  |  |
|   | (ii)                                                                                                                                                                                                                                                     | 6.0 m Single Leg Extension   | No. | -     |  |  |  |  |  |  |
|   | (iii)                                                                                                                                                                                                                                                    | Stubs                        | No. | -     |  |  |  |  |  |  |
|   | <b><u>Conductor and OPGW (With Associated Equipment)</u></b>                                                                                                                                                                                             |                              |     |       |  |  |  |  |  |  |
| 2 | Furnish 795 KCM ACSR "Drake" Conductor                                                                                                                                                                                                                   |                              | km  | 76.80 |  |  |  |  |  |  |
| 3 | Furnish                                                                                                                                                                                                                                                  |                              |     |       |  |  |  |  |  |  |
|   | (a)                                                                                                                                                                                                                                                      | OPGW with at least 24 fibers | km  | 10    |  |  |  |  |  |  |
|   | (b)                                                                                                                                                                                                                                                      | Joint boxes for OPGW         |     |       |  |  |  |  |  |  |
|   | (i)                                                                                                                                                                                                                                                      | OPGW-OPGW (A Type)           | No. | 2     |  |  |  |  |  |  |
|   | (ii)                                                                                                                                                                                                                                                     | OPGW-OPGW Cable ( B Type)    | No. | -     |  |  |  |  |  |  |
|   | (iii)                                                                                                                                                                                                                                                    | OPGW-attaching Clamps        | No. | 120   |  |  |  |  |  |  |
|   | (iv)                                                                                                                                                                                                                                                     | Fibre Optic Approach Cable   | km  | -     |  |  |  |  |  |  |
|   | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                             |                              |     |       |  |  |  |  |  |  |
| 4 | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DS1' as per specification drawing No. 4029/169/401C/TD/01E001        |                              | Set | 42    |  |  |  |  |  |  |
| 5 | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 36x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for double circuit tower type 'DA1' & 'DD1' as per specification drawing No. 4029/169/401C/TD/01E002 |                              | Set | 36    |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                                                    |     |    |  |  |  |  |  |  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|--|--|--|--|--|--|
| 6  | Furnish Quad String Dead End Assemblies for quad bundle type "DE(4)" for double circuit tower types 'DA1' & 'DD1' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005 | Set | 72 |  |  |  |  |  |  |
| 7  | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'DGM' as per specification drawing No. NTDC/DESIGN/01E153                        | Set | 1  |  |  |  |  |  |  |
| 8  | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004                   | Set | 2  |  |  |  |  |  |  |
| 9  | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower type 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005                               | Set | 6  |  |  |  |  |  |  |
| 10 | Furnish Double String Dead End Assemblies for quad bundle "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                 | Set | 6  |  |  |  |  |  |  |
| 11 | Furnish Double String Dead End Assemblies for quad bundle "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                | Set | 6  |  |  |  |  |  |  |
|    | <b><u>Hardware for OPGW</u></b>                                                                                                                                                                                                                                    |     |    |  |  |  |  |  |  |

|    |                                                                                                                                                                          |       |     |  |  |  |  |  |  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|--|--|--|--|--|--|
| 12 | Furnish Suspension Assembly for OPGW including AGS clamp for double circuit tower type 'DS1' as per specification drawing No. 4029/169/TD/401C/01E012                    | Set   | 14  |  |  |  |  |  |  |
| 13 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification drawing No. 4029/169/TD/401C/01E013                                             | Set   | 2   |  |  |  |  |  |  |
| 14 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification drawing No. 4029/169/TD/401C/01E014                                | Set   | 13  |  |  |  |  |  |  |
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |       |     |  |  |  |  |  |  |
| 15 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 | No.   | 26  |  |  |  |  |  |  |
| 16 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      | No.   | 13  |  |  |  |  |  |  |
| 17 | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No.   | 396 |  |  |  |  |  |  |
| 18 | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No.   | 650 |  |  |  |  |  |  |
| 19 | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor                                                                                               | No.   | 162 |  |  |  |  |  |  |
| 20 | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No.   | 83  |  |  |  |  |  |  |
|    | <b><u>Grounding Material</u></b>                                                                                                                                         |       |     |  |  |  |  |  |  |
| 18 | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            | No.   | 28  |  |  |  |  |  |  |
| 19 | Furnish flat to cable connector.                                                                                                                                         | No.   | 28  |  |  |  |  |  |  |
| 20 | Furnish cable to rod connector.                                                                                                                                          | No.   | 28  |  |  |  |  |  |  |
| 21 | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             | Meter | 84  |  |  |  |  |  |  |



|                                                           |                         |  |  |  |  |  |   |
|-----------------------------------------------------------|-------------------------|--|--|--|--|--|---|
|                                                           | <b>Sub-Total of G :</b> |  |  |  |  |  | - |
|                                                           | Total of Item A         |  |  |  |  |  | - |
|                                                           | Total of Item B         |  |  |  |  |  | - |
|                                                           | Total of Item C         |  |  |  |  |  | - |
|                                                           | Total of Item D         |  |  |  |  |  | - |
|                                                           | Total of Item E         |  |  |  |  |  | - |
|                                                           | Total of Item F         |  |  |  |  |  | - |
|                                                           | Total of Item G         |  |  |  |  |  | - |
| <b>Total of Column 9 to be forwarded to Grand Summary</b> |                         |  |  |  |  |  | - |
|                                                           |                         |  |  |  |  |  |   |

- \* The Bidder shall specify the type of insulator being offered.

**Notes:**

- 1 Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types DS1, DA1, DD1, DGM, and TDT, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly.
- 2 The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.
- 3 The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.
- 4 The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.
- 5 The bidder shall be responsible to furnish the tower material, OPGW, conductor, insulators, accessories, dampers & hardware for conductor and OPGW, for completion of line in all respect. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.

- 6 The contractor shall transport, unload and stack leftover/additional material from site to NGC designated Warehouse/Store at its own cost.
- 7 Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.
- 8 The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully before filling up the schedule of prices.
- 9 Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.
- 10 Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.
- 11 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.

**Signature of Bidder**

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**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-VI: 500 kV D/C C5-Ludewala – Section D (Approx. 32 km)**  
**Schedule No.3 - Design Services**

| Item                                                  | Description | Qty. | Unit Price <sup>1</sup><br>Local<br>Currency | Total Price | Total<br>Provincial<br>Sales Tax |
|-------------------------------------------------------|-------------|------|----------------------------------------------|-------------|----------------------------------|
| 1                                                     | 2           | 3    | 4                                            | 5 = 3 x 4   | 6                                |
| 1                                                     |             | Lot  |                                              |             |                                  |
| NOT APPLICABLE                                        |             |      |                                              |             |                                  |
| 2                                                     |             | Lot  |                                              |             |                                  |
| 3                                                     |             | Lot  |                                              |             |                                  |
| TOTAL Column 5 to be carried forward to Grand Summary |             |      |                                              |             |                                  |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>1</sup>Specify currency in accordance ITB 12.

| <b>Design, Manufacture, Procurement, Supply, Laying, Installation, Testing &amp; Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme</b><br><b>Lot-VI: 500 kV D/C C5-Ludewala —Section D (Approx. 32 km)</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |          |     |                  |                                                                                                     |                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----|------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------|
| <b><u>SCHEDULE NO.4 - INSTALLATION AND OTHER SERVICES</u></b><br><b><u>(INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)</u></b>                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |          |     |                  |                                                                                                     |                                         |
| Item No.                                                                                                                                                                                                                            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Unit     | Qty | Unit Price (PKR) | Total Price (PKR) Including all Custom duties, taxes and other levies etc. w/o Provincial Sales Tax | Total Provincial Sales tax (PST) in PKR |
| 1                                                                                                                                                                                                                                   | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3        | 4   | 5                | 6=4*5                                                                                               | 7                                       |
|                                                                                                                                                                                                                                     | <b>INSTALLATION (INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)</b>                                                                                                                                                                                                                                                                                                                                                                                                             |          |     |                  |                                                                                                     |                                         |
| <b>A</b>                                                                                                                                                                                                                            | <b><u>Survey</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |     |                  |                                                                                                     |                                         |
| 1                                                                                                                                                                                                                                   | Clearing Right of Way (ROW)                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Lump Sum | 1   |                  |                                                                                                     |                                         |
| 2                                                                                                                                                                                                                                   | Validation of already established centre line prior to foundation construction and preparation of as-built plan & profile drawings of the already prepared plan & profile drawings using PLS-CADD and construction structure lists (to be provided to the Contractor after award of contract) of the constructed transmission line after incorporating all the changes and submitted to the Project Manager. In case of route diversion, payment of the diverted portion will be made as per item A.3 | km       | 32  |                  |                                                                                                     |                                         |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                               |            |     |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|------------|-----|--|--|--|
| 3        | Route alignment and detailed surveying of diverted portion not limited to chainage and leveling, preparation of plan & profile drawings, spotting of towers and preparation of construction structure list & Latitude & Longitude with hand held GPS of each tower location                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                               | km         | 3.2 |  |  |  |
|          | <b>Sub-Total A:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                               |            |     |  |  |  |
| <b>B</b> | <b><u>Sub-soil Investigations:</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                               |            |     |  |  |  |
|          | Sub-Soil Investigation for T/Line at (ii) and confirmatory sub-soil Investigation in varied soil/boulder/rock (including laboratory tests) as per Specifications (Technical Provisions for Construction Clause 10.2) and submission of Sub-Soil Investigation Report.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                               |            |     |  |  |  |
| (a)      | From NSL to depth of 15 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                               | Lin. Mtr.  | 45  |  |  |  |
| (b)      | From 15 m to depth of 25 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                               | Lin. Mtr.  | 10  |  |  |  |
| (c)      | Hand Auger upto depth of 10m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                               | Lin. Mtr.  | 40  |  |  |  |
|          | <b>Sub-Total B:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                               |            |     |  |  |  |
| <b>C</b> | <b><u>Foundations</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                               |            |     |  |  |  |
|          | Reinforced Concrete Spread Foundations (4 legs) complete in all respect in varied soil as well as boulders/rock complete with supply of materials including alignment, peg marking, access, preparatory works, excavation, blasting, leveling, grading of tower site, cutting, dewatering, shuttering, reinforcement, concreting (using Sulphate Resistance Cement conforming to ASTM C-150 Type-V), lean concrete (if required), curing, backfilling of foundations after concreting with excavated/borrowed earth (irrespective of lead), application of three (03) coats hot bitumen (ExpanProof* 10 – Fospak bitumen and compaction of backfill material in layers, stub setting and site restoration etc. including tower staking (Latitude & Longitude with hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type as per drawings and specifications: |                                                                               |            |     |  |  |  |
|          | (a)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | DS1 (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G010 |            |     |  |  |  |
|          | (i)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Foundation Type D1 (Dry)                                                      | Foundation | 6   |  |  |  |
|          | (ii)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Foundation Type D2 (Dry)                                                      | Foundation | 2   |  |  |  |

|          |                                |                                                                               |            |   |  |  |  |
|----------|--------------------------------|-------------------------------------------------------------------------------|------------|---|--|--|--|
|          | (iii)                          | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                     | Foundation | 0 |  |  |  |
|          | (iv)                           | Foundation Type W (Submerged) (Refer to Note No. 07)                          | Foundation | 0 |  |  |  |
| (b)      |                                | DA1 (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G011 |            |   |  |  |  |
|          | (i)                            | Foundation Type D1 (Dry)                                                      | Foundation | 1 |  |  |  |
|          | (ii)                           | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                     | Foundation | 0 |  |  |  |
| (c)      |                                | DD1 (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G012 |            |   |  |  |  |
|          | (i)                            | Foundation Type D1 (Dry)                                                      | Foundation | 1 |  |  |  |
|          | (ii)                           | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                     | Foundation | 0 |  |  |  |
| (d)      |                                | TDT (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G020 |            |   |  |  |  |
|          | (i)                            | Foundation Type D1 (Dry)                                                      | Foundation | 1 |  |  |  |
|          | (ii)                           | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                     | Foundation | 0 |  |  |  |
| (e)      |                                | DGM (Complete Foundation 4 Legs) as per Drawing No. 4029/169/TLC-22/TD/01G019 |            |   |  |  |  |
|          | (i)                            | Foundation Type D1 (Dry)                                                      | Foundation | 2 |  |  |  |
|          | (ii)                           | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                     | Foundation | 0 |  |  |  |
|          | <b>Sub-Total C:</b>            |                                                                               |            |   |  |  |  |
| <b>D</b> | <b><u>Pile Foundations</u></b> |                                                                               |            |   |  |  |  |

|  |     |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |           |  |  |  |
|--|-----|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|--|--|--|
|  | D-1 |      | Reinforced concrete pile foundations (cast in situ installation) complete in all type of soil as well as boulders/gravels/rock with supply of materials including excavation, drilling/boring, shuttering, reinforcement, concreting, bitumen coating, backfilling, installation of Stubs, tower grounding, site clearing etc. using Sulphate Resistance Cement conforming to ASTM C-150 Type-V shall be used including tower staking (Latitude & Longitude with RTK/hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type: |            |           |  |  |  |
|  | (a) |      | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DS1, and drawing No. <b>4029/169/TLC-22/TD/01G014</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Foundation | <b>55</b> |  |  |  |
|  | (b) |      | Reinforced concrete single pile per footing 900 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G014</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |           |  |  |  |
|  |     | (i)  | Pile shaft upto depth of 20 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Lin.mtr    | 4400      |  |  |  |
|  |     | (ii) | Pile shaft depth 20 - 25 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lin.mtr    | 40        |  |  |  |
|  | (c) |      | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DA1, and drawing No. <b>4029/169/TLC-22/TD/01G015</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Foundation | <b>9</b>  |  |  |  |
|  | (d) |      | Reinforced concrete single pile per footing 1200 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G015</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |           |  |  |  |
|  |     | (i)  | Pile shaft upto depth of 20 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Lin.mtr    | 720       |  |  |  |
|  |     | (ii) | Pile shaft depth 20 - 25 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lin.mtr    | 80        |  |  |  |
|  | (e) |      | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DD1/DT1, and drawing No. <b>4029/169/TLC-22/TD/01G016</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Foundation | <b>12</b> |  |  |  |
|  | (f) |      | Reinforced concrete single pile per footing 1500 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G016</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |           |  |  |  |

|  |     |                                                                                                                                                        |                                                                                                                                                               |            |          |  |  |  |
|--|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|--|--|--|
|  |     | (i)                                                                                                                                                    | Pile shaft upto depth of 20 m                                                                                                                                 | Lin.mtr    | 960      |  |  |  |
|  |     | (ii)                                                                                                                                                   | Pile shaft depth 20 - 25 m                                                                                                                                    | Lin.mtr    | 240      |  |  |  |
|  |     | (iii)                                                                                                                                                  | Pile shaft depth 25 - 30 m                                                                                                                                    | Lin.mtr    | 120      |  |  |  |
|  | (g) |                                                                                                                                                        | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DGM, and drawing No. <b>3206/169/TD/01G112</b>                           | Foundation | <b>2</b> |  |  |  |
|  | (h) |                                                                                                                                                        | Reinforced concrete single pile per footing 1200 mm dia. as per drawing No. <b>3206/169/TD/01G112</b> (including steel liner/casing), if required.            |            |          |  |  |  |
|  |     | (i)                                                                                                                                                    | Pile shaft upto depth of 20 m                                                                                                                                 | Lin.mtr    | 160      |  |  |  |
|  |     | (ii)                                                                                                                                                   | Pile shaft depth 20 - 25 m                                                                                                                                    | Lin.mtr    | 40       |  |  |  |
|  | D-2 | Pile load test in compression confirming to ASTM D1143 / D1143M and in uplift confirming to ASTM D3689 / D3689M at 2.5 times of tower foundation loads |                                                                                                                                                               |            |          |  |  |  |
|  |     |                                                                                                                                                        |                                                                                                                                                               |            |          |  |  |  |
|  |     | (a)                                                                                                                                                    | DS1 (In Compression)                                                                                                                                          | Pile       | 1        |  |  |  |
|  |     | (b)                                                                                                                                                    | DS1 (In Tension/Uplift)                                                                                                                                       | Pile       | 1        |  |  |  |
|  |     | (c)                                                                                                                                                    | DD1/DT1 (In Compression)                                                                                                                                      | Pile       | 1        |  |  |  |
|  |     | (d)                                                                                                                                                    | DD1/DT1 (In Tension/Uplift)                                                                                                                                   | Pile       | 1        |  |  |  |
|  |     | (e)                                                                                                                                                    | Reinforced concrete single Test pile per footing 900 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G014</b> (including steel liner/casing), if required. |            | 2        |  |  |  |
|  |     | (i)                                                                                                                                                    | Pile shaft upto depth of 20 m                                                                                                                                 | Lin.mtr    | 40       |  |  |  |
|  |     | (ii)                                                                                                                                                   | Pile shaft depth 20 - 25 m                                                                                                                                    | Lin.mtr    | 10       |  |  |  |



|          |                                                                                                                                                                                                                                                                                 |                                                                                                                                                                |                    |       |  |  |  |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|--|--|--|
|          | (f)                                                                                                                                                                                                                                                                             | Reinforced concrete single Test pile per footing 1500 mm dia. as per drawing No. <b>4029/169/TLC-22/TD/01G016</b> (including steel liner/casing), if required. |                    | 2     |  |  |  |
|          | (i)                                                                                                                                                                                                                                                                             | Pile shaft upto depth of 20 m                                                                                                                                  | Lin.mtr            | 40    |  |  |  |
|          | (ii)                                                                                                                                                                                                                                                                            | Pile shaft depth 20 - 30 m                                                                                                                                     | Lin.mtr            | 20    |  |  |  |
|          | (iii)                                                                                                                                                                                                                                                                           | Pile shaft depth 30 - 35 m                                                                                                                                     | Lin.mtr            | 10    |  |  |  |
| D-6      |                                                                                                                                                                                                                                                                                 | Sonic Integrity Test at pile foundation confirming to ASTM D5882                                                                                               | No.                | 70    |  |  |  |
|          | <b>Sub-Total D:</b>                                                                                                                                                                                                                                                             |                                                                                                                                                                |                    |       |  |  |  |
| <b>E</b> | <b><u>Erection of Steel Towers</u></b>                                                                                                                                                                                                                                          |                                                                                                                                                                |                    |       |  |  |  |
| 1        | Transport and Install 500kV double circuit tower types 'DS1', 'DA1', 'DD1' & TDT with all accessories i.e anti climbing devices, aerial markers number plates, danger signs, phase plates, Bird Guards etc. in accordance with requirements of Bidding Documents                |                                                                                                                                                                | Ton                | 3,585 |  |  |  |
| 2        | Welding of erected tower bolts & nuts after final inspection upto height of 8.0 m from top of foundation chimney as per specification drawing                                                                                                                                   |                                                                                                                                                                | Each tower         | 103   |  |  |  |
|          | <b>Sub-Total E:</b>                                                                                                                                                                                                                                                             |                                                                                                                                                                |                    |       |  |  |  |
| <b>F</b> | <b><u>Stringing of Conductor and OPGW</u></b>                                                                                                                                                                                                                                   |                                                                                                                                                                |                    |       |  |  |  |
| 1        | Transport & Install 795KCM ACSR Drake for quad conductor configuration insulator hanging, hardware assemblies, accessories & dampers etc. complete in all respects as per specifications & approved drawings and methodology.                                                   |                                                                                                                                                                | km D/C Quad Bundle | 32    |  |  |  |
| 2        | Transport & Install OPGW including installation of drop down lengths for joint boxes at the towers along with allied hardware material including hardware assemblies, joint boxes accessories, dampers etc. complete in all respects as per specifications & approved drawings. |                                                                                                                                                                | km (on Both Peaks) | 32    |  |  |  |
|          | <b>Sub-Total F:</b>                                                                                                                                                                                                                                                             |                                                                                                                                                                |                    |       |  |  |  |
| <b>G</b> | <b><u>Testing &amp; Commissioning</u></b>                                                                                                                                                                                                                                       |                                                                                                                                                                |                    |       |  |  |  |

|          |                                                                                                                                      |         |      |  |   |   |
|----------|--------------------------------------------------------------------------------------------------------------------------------------|---------|------|--|---|---|
| 1        | Testing and commissioning of the line                                                                                                | Lumpsum | 1    |  |   |   |
|          | <b>Sub-Total G:</b>                                                                                                                  |         |      |  |   |   |
| <b>H</b> | <b><u>ENVIRONMENTAL AND SOCIAL SAFEGUARDS</u></b>                                                                                    |         |      |  |   |   |
| 1        | Tree Plantation (Minimum height 4 feet)                                                                                              | No.     | 3000 |  |   |   |
| 2        | Water quality monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route. | No.     | 28   |  |   |   |
| 3        | Ambient Air monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route.   | No.     | 28   |  |   |   |
| 4        | Noise monitoring / analysis / measurement on quarterly basis for the whole project period at three locations along the TL route.     | No.     | 28   |  |   |   |
|          | <b>Sub-Total H:</b>                                                                                                                  |         |      |  | - | - |
|          |                                                                                                                                      |         |      |  |   |   |
| <b>I</b> | <b><u>INSTALLATION SERVICES FOR ADDITIONAL WORK</u></b>                                                                              |         |      |  |   |   |
| 1        | Grading/Cutting/Excavation (Dry Soil)                                                                                                | Cu. m.  | 60   |  |   |   |
| 2        | Excavation (semi-submerged soil)                                                                                                     | Cu. m.  | 40   |  |   |   |
| 3        | Excavation (submerged soil)                                                                                                          | Cu. m.  | 40   |  |   |   |
| 4        | Blasting/Cutting/Excavation/Grading (boulder/Rock)                                                                                   | Cu. m.  | 50   |  |   |   |
| 5        | Concrete (3000 psi at 28 days) furnished and installed                                                                               | Cu. m.  | 100  |  |   |   |
| 6        | Concrete (4000 psi at 28 days) furnished and installed                                                                               | kg      | 25   |  |   |   |
| 7        | Reinforcing Bars furnished and installed (Grade-60)                                                                                  | Cu. m.  | 1000 |  |   |   |
| 8        | Overhaul from Borrow and Compaction (regardless of the distance for borrow)                                                          | Cu. m.  | 100  |  |   |   |
| 9        | Lean concrete furnished and installed (2000 psi strength at 28 days)                                                                 | Cu. m.  | 70   |  |   |   |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                             |       |     |  |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|-----|--|--|--|
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Compacted crush+sand (50:50 ratio) installed under footings | Sq. m | 50  |  |  |  |
| 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Bitumen coating for footing                                 | L.m   | 50  |  |  |  |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Compacted Backfill                                          | L.m   | 100 |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Sub-Total I:</b>                                         |       |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item A</b>                                      |       |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item B</b>                                      |       |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item C</b>                                      |       |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item D</b>                                      |       |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item E</b>                                      |       |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item F</b>                                      |       |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item G</b>                                      |       |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item H</b>                                      |       |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Total of Item I</b>                                      |       |     |  |  |  |
| <b>Total (Column 6) to be carried forward to Grand Summary</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                             |       |     |  |  |  |
| <p><b><u>Notes:</u></b></p> <ol style="list-style-type: none"> <li>1 The quantities mentioned in the BOQ are estimated quantities. These quantities are to be used for bid evaluation purpose only. The actual quantities may vary depending upon detailed engineering and approved drawings. However, the unit rates for material and service quoted in the BOQ/ bid shall remain firm and final if design is unchanged.</li> <li>2 Price of any other item specifically not covered in the Price Schedules but is required for the completion, commissioning and operation of the transmission line shall be deemed to be included in the Price Schedules.</li> <li>3 In case of failure by the bidder to fill the price of Sales Tax in relevant column, the quoted price of the bidder will be considered inclusive of Sales Tax applicable as per Lax and relevant provisions of the Bidding Documents. In case the bidder takes deviation or mention that prices are exclusive of PST, his bid shall be considered as non-responsive.</li> <li>4 Foundation means four legs of tower.</li> </ol> |                                                             |       |     |  |  |  |

- 5 An allowance of two percent (2%) of the total installed quantity will be permitted for sag, jumpers and wastage for the conductor, one percent (1%) for OPGW and two percent (2%) for lossage of nuts, bolts and washers (for towers only); and one percent (1%) for insulator breakage. These allowances are the maximum permissible and in case of wastage less than these limits all excess material shall be returned to NGC storage yards by the Contractor. For quantities in excess of these limits, the Contractor shall replace or reimburse NGC for the loss. All unused, above allowable limits of waste materials and packing wood are the property of NGC and shall be returned to NGC storage yards by the Contractor.
- 6 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.
- 7 The Bidder shall quote prices against all items, including those for which the specified quantity is "0". No item shall be left blank or unpriced in the Price Schedule.
- 8 Pile Foundation design will be release after the submission of Pile load test Report.
- 9 Location for Sonic Integrity and sonic integrity test report approval will be accorded by the office of DG (C&SE) NGC.

**Name of Bidder**

**Signature of Bidder**

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme**  
**Lot-VI: 500 kV D/C C5-Ludewala —Section D (Approx. 32 km)**

**SCHEDULE NO. 5 - GRAND SUMMARY**

| Sr.<br>No.                                                      | Description                                                                                      | Bid Prices                    |                                   |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------|
|                                                                 |                                                                                                  | Foreign Currency<br>Component | Local Currency<br>Component (PKR) |
| 1                                                               | Total Schedule No. 1 Plant and Mandatory Spare Parts Supplied from Abroad                        |                               |                                   |
| 2                                                               | Total Schedule No. 2 Plant and Mandatory Spare Parts Supplied from Within the Employer's Country |                               |                                   |
| 3                                                               | Total Schedule No. 3 Design Services                                                             |                               |                                   |
| 4                                                               | Total Schedule No. 4 Installation and Other Services                                             |                               |                                   |
| 5                                                               | Provisional Sum                                                                                  |                               | 1,920 Million                     |
| <b>GRAND TOTAL to be carried forward to Letter of Price Bid</b> |                                                                                                  |                               |                                   |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

- 1 Specify the currency in accordance with ITB 12 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-VI: 500 kV D/C C5-Ludewala – Section D (Approx. 32 km)**

**Schedule No. 6 - Recommended Spare Parts**

| Item | Description    | Qty | Unit Price                              |                                                 | Total Price                  |                                |
|------|----------------|-----|-----------------------------------------|-------------------------------------------------|------------------------------|--------------------------------|
|      |                |     | EXW<br>Local Parts<br>Local<br>Currency | CIP<br>Imported<br>Parts<br>Foreign<br>Currency | Local<br>Currency<br>Portion | Foreign<br>Currency<br>Portion |
| 1    | 2              | 3   | 4                                       | 5                                               | 6 = 3 x 4                    | 7 = 3 x 5                      |
|      | NOT APPLICABLE |     |                                         |                                                 |                              |                                |
|      |                |     |                                         |                                                 |                              |                                |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

# **Schedules of Rates and Prices**

## **(LOT-VII)**

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5  
Power Evacuation Scheme  
Lot-VII: 500 kV S/C C5-Ludewala —Section A (Approx. 30 km)**

**SCHEDULE NO.1- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM ABROAD**

| Item No. | Description                                                                                                                                                                                                                                                                                      |                  |                            | Code Country of Origin | Unit | Quantity | Unit Price (CIF Pakistan Seaport) |           | Total Price (CIF Pakistan Seaport) |           | Total Inland Transportation | Total Price CIP (Project Site) |          | Taxes & Duties |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------|------------------------|------|----------|-----------------------------------|-----------|------------------------------------|-----------|-----------------------------|--------------------------------|----------|----------------|
|          |                                                                                                                                                                                                                                                                                                  |                  |                            |                        |      |          | CFR                               | Insurance | CFR                                | Insurance |                             | FCC                            | LCC      | Local Currency |
| 1        | 2                                                                                                                                                                                                                                                                                                |                  |                            | 3                      | 4    | 5        | 6                                 | 7         | 8=5 x 6                            | 9 = 5 x 7 | 10                          | 11=8                           | 12= 9+10 | 13             |
|          |                                                                                                                                                                                                                                                                                                  |                  |                            |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|          | <b><u>500kV Single Circuit Transmission Line</u></b>                                                                                                                                                                                                                                             |                  |                            |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| <b>A</b> | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                       |                  |                            |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| 1        | Furnish 500kV Single circuit towers SGM, AGM ,DGM & TGM including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                  |                            |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|          | (a)                                                                                                                                                                                                                                                                                              | Tower Type "SGM" |                            |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|          |                                                                                                                                                                                                                                                                                                  | (i)              | Basic Tower Body           |                        | No.  | 75       |                                   |           |                                    |           |                             |                                |          |                |
|          |                                                                                                                                                                                                                                                                                                  | (ii)             | 1.5 m Single Leg Extension |                        | No.  | -        |                                   |           |                                    |           |                             |                                |          |                |
|          |                                                                                                                                                                                                                                                                                                  | (iii)            | 3.0 m Single Leg Extension |                        | No.  | 60       |                                   |           |                                    |           |                             |                                |          |                |
|          |                                                                                                                                                                                                                                                                                                  | (iv)             | 4.5 m Single Leg Extension |                        | No.  | 120      |                                   |           |                                    |           |                             |                                |          |                |
|          |                                                                                                                                                                                                                                                                                                  | (v)              | 6.0 m Single Leg Extension |                        | No.  | 120      |                                   |           |                                    |           |                             |                                |          |                |
|          |                                                                                                                                                                                                                                                                                                  | (vi)             | 4.5 m Body Extension       |                        | No.  | 10       |                                   |           |                                    |           |                             |                                |          |                |
|          |                                                                                                                                                                                                                                                                                                  | (vii)            | 9.0 m Body Extension       |                        | No.  | 10       |                                   |           |                                    |           |                             |                                |          |                |



|          |                                                              |                            |     |     |  |  |  |  |  |  |  |  |  |
|----------|--------------------------------------------------------------|----------------------------|-----|-----|--|--|--|--|--|--|--|--|--|
|          | (viii)                                                       | Stubs                      | No. | 300 |  |  |  |  |  |  |  |  |  |
|          | (b)                                                          | <u>Tower Type "AGM"</u>    |     |     |  |  |  |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body           | No. | 13  |  |  |  |  |  |  |  |  |  |
|          | (ii)                                                         | 1.5 m Single Leg Extension | No. | -   |  |  |  |  |  |  |  |  |  |
|          | (iii)                                                        | 3.0 m Single Leg Extension | No. | 12  |  |  |  |  |  |  |  |  |  |
|          | (iv)                                                         | 4.5 m Single Leg Extension | No. | 20  |  |  |  |  |  |  |  |  |  |
|          | (v)                                                          | 6.0 m Single Leg Extension | No. | 20  |  |  |  |  |  |  |  |  |  |
|          | (vi)                                                         | 4.5 m Body Extension       | No. | 2   |  |  |  |  |  |  |  |  |  |
|          | (vii)                                                        | 9.0 m Body Extension       | No. | 3   |  |  |  |  |  |  |  |  |  |
|          | (viii)                                                       | Stubs                      | No. | 52  |  |  |  |  |  |  |  |  |  |
|          | (c)                                                          | <u>Tower Type "DGM"</u>    |     |     |  |  |  |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body           | No. | 18  |  |  |  |  |  |  |  |  |  |
|          | (ii)                                                         | 1.5 m Single Leg Extension | No. | -   |  |  |  |  |  |  |  |  |  |
|          | (iii)                                                        | 3.0 m Single Leg Extension | No. | 16  |  |  |  |  |  |  |  |  |  |
|          | (iv)                                                         | 4.5 m Single Leg Extension | No. | 28  |  |  |  |  |  |  |  |  |  |
|          | (v)                                                          | 6.0 m Single Leg Extension | No. | 28  |  |  |  |  |  |  |  |  |  |
|          | (vi)                                                         | 4.5 m Body Extension       | No. | 4   |  |  |  |  |  |  |  |  |  |
|          | (vii)                                                        | 9.0 m Body Extension       | No. | 4   |  |  |  |  |  |  |  |  |  |
|          | (viii)                                                       | Stubs                      | No. | 72  |  |  |  |  |  |  |  |  |  |
|          | (d)                                                          | <u>Tower Type "TGM"</u>    |     |     |  |  |  |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body           | No. | -   |  |  |  |  |  |  |  |  |  |
|          | (ii)                                                         | 6.0 m Single Leg Extension | No. | -   |  |  |  |  |  |  |  |  |  |
|          | (iii)                                                        | Stubs                      | No. | -   |  |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total A :</b>                                         |                            |     |     |  |  |  |  |  |  |  |  |  |
| <b>B</b> | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                            |     |     |  |  |  |  |  |  |  |  |  |
| 1        | Furnish 795 KCM ACSR "Drake" Conductor                       |                            | km  | 368 |  |  |  |  |  |  |  |  |  |
| 2        | Furnish                                                      |                            |     |     |  |  |  |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                      |                                                                |     |     |  |  |  |  |  |  |  |  |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-----|-----|--|--|--|--|--|--|--|--|
|          | (a)                                                                                                                                                                                                                                                  | OPGW with at least 24 fibers                                   | km  | 35  |  |  |  |  |  |  |  |  |
|          | (b)                                                                                                                                                                                                                                                  | Joint boxes for OPGW                                           |     |     |  |  |  |  |  |  |  |  |
|          | (i)                                                                                                                                                                                                                                                  | OPGW-OPGW (A Type)                                             | No. | 7   |  |  |  |  |  |  |  |  |
|          | (ii)                                                                                                                                                                                                                                                 | OPGW-OPGW Cable ( B Type)                                      | No. | 2   |  |  |  |  |  |  |  |  |
|          | (iii)                                                                                                                                                                                                                                                | OPGW-attaching Clamps                                          | No. | 540 |  |  |  |  |  |  |  |  |
|          | (iv)                                                                                                                                                                                                                                                 | Fibre Optic Approach Cable                                     | km  | 3   |  |  |  |  |  |  |  |  |
|          | (c)                                                                                                                                                                                                                                                  | Test Equipment, Installation and Maintenance Tools             |     | -   |  |  |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                    | Fiber Optic Talk Set (Set comprised two units)                 | Set | 1   |  |  |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                    | Fiber Optic Tool Kit                                           | Set | 1   |  |  |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                    | OTDR with range $\geq 400$ km<br>Yokogawa AQ7260 or equivalent | Set | 1   |  |  |  |  |  |  |  |  |
| 3        |                                                                                                                                                                                                                                                      | Furnish 9.15 mm dia EHS Shieldwire                             | km  | 32  |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                      |                                                                |     |     |  |  |  |  |  |  |  |  |
|          | <b>Sub Total B :</b>                                                                                                                                                                                                                                 |                                                                |     |     |  |  |  |  |  |  |  |  |
| <b>C</b> | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                         |                                                                |     |     |  |  |  |  |  |  |  |  |
| 1        | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'SGM' & 'TGM' as per specification drawing No. NTDC/DESIGN/01E151 |                                                                | Set | 225 |  |  |  |  |  |  |  |  |
| 2        | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per                                               |                                                                | Set | 31  |  |  |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                          |  |         |     |  |  |  |  |  |  |  |  |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------|-----|--|--|--|--|--|--|--|--|
|   | specification drawing No.<br>NTDC/DESIGN/01E153                                                                                                                                                                                                          |  |         |     |  |  |  |  |  |  |  |  |
| 3 | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x1 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004 |  | Set     | 62  |  |  |  |  |  |  |  |  |
| 4 | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower types 'AGM' & 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005            |  | Set     | 186 |  |  |  |  |  |  |  |  |
| 5 | Furnish Transposition Assembly Type IT(4) for tower type 'TGM' including 25x1 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. NTDC/DESIGN/01E152                                               |  | Set     | -   |  |  |  |  |  |  |  |  |
| 6 | Furnish Double String Dead End Assemblies "DSD1(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                       |  | Set     | 3   |  |  |  |  |  |  |  |  |
| 7 | Furnish Double String Dead End Assemblies "DSD2(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                      |  | Set     | 3   |  |  |  |  |  |  |  |  |
| 8 | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assemblies (items C1 - C7) with Coulomb or ElecNET software.                                                                                    |  | Lumpsum | 1   |  |  |  |  |  |  |  |  |

|          |                                                                                                                                                                          |  |     |      |  |  |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|------|--|--|--|--|--|--|--|--|
|          | <b>Sub-Total C :</b>                                                                                                                                                     |  |     |      |  |  |  |  |  |  |  |  |
| <b>D</b> | <b><u>Hardware for OPGW &amp; Shieldwire</u></b>                                                                                                                         |  |     |      |  |  |  |  |  |  |  |  |
| 1        | Furnish Suspension Assembly for OPGW including AGS clamp for single circuit tower type 'SGM' & 'TGM' as per specification                                                |  | Set | 75   |  |  |  |  |  |  |  |  |
| 2        | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification                                                                                 |  | Set | 7    |  |  |  |  |  |  |  |  |
| 3        | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification                                                                    |  | Set | 31   |  |  |  |  |  |  |  |  |
| 4        | Overhead shield wire suspension assembly for tower type 'SGM' & 'TGM' as per specification drawing                                                                       |  | Set | 75   |  |  |  |  |  |  |  |  |
| 5        | Overhead shieldwire dead end assembly for tower type 'AGM' & 'DGM' as per specification drawing                                                                          |  | Set | 62   |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total D :</b>                                                                                                                                                     |  |     |      |  |  |  |  |  |  |  |  |
| <b>E</b> | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |  |     |      |  |  |  |  |  |  |  |  |
| 1        | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 |  | No. | 127  |  |  |  |  |  |  |  |  |
| 2        | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      |  | No. | 63   |  |  |  |  |  |  |  |  |
| 3        | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. |  | No. | 845  |  |  |  |  |  |  |  |  |
| 4        | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                |  | No. | 2317 |  |  |  |  |  |  |  |  |
| 5        | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor (See Note-3)                                                                                  |  | No. | 579  |  |  |  |  |  |  |  |  |
| 6        | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         |  | No. | 286  |  |  |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                                                                  |       |     |  |  |  |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|--|--|--|--|--|--|--|--|--|
| 7        | Furnish stock bridge vibration dampers for Shield Wire.                                                                                                                                                                                                                                          | No.   | 286 |  |  |  |  |  |  |  |  |  |
| 8        | Compression splice for 9.15mm dia EHS Shield Wire                                                                                                                                                                                                                                                | No.   | 10  |  |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total E :</b>                                                                                                                                                                                                                                                                             |       |     |  |  |  |  |  |  |  |  |  |
| <b>F</b> | <b><u>Grounding Material</u></b>                                                                                                                                                                                                                                                                 |       |     |  |  |  |  |  |  |  |  |  |
| 1        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                                                                                                                                                    | No.   | 212 |  |  |  |  |  |  |  |  |  |
| 2        | Furnish flat to cable connector.                                                                                                                                                                                                                                                                 | No.   | 212 |  |  |  |  |  |  |  |  |  |
| 3        | Furnish cable to rod connector.                                                                                                                                                                                                                                                                  | No.   | 212 |  |  |  |  |  |  |  |  |  |
| 4        | Furnish 7 No. 10 copper covered ground wire.                                                                                                                                                                                                                                                     | Meter | 636 |  |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total F :</b>                                                                                                                                                                                                                                                                             |       |     |  |  |  |  |  |  |  |  |  |
| <b>G</b> | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                                                                                                                                              |       |     |  |  |  |  |  |  |  |  |  |
| <b>1</b> | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                       |       |     |  |  |  |  |  |  |  |  |  |
|          | Furnish 500kV Single circuit towers SGM, AGM ,DGM & TGM including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |       |     |  |  |  |  |  |  |  |  |  |
|          | (a) <u>Tower Type "SGM"</u>                                                                                                                                                                                                                                                                      |       |     |  |  |  |  |  |  |  |  |  |
|          | (i) Basic Tower Body                                                                                                                                                                                                                                                                             | No.   | 8   |  |  |  |  |  |  |  |  |  |
|          | (ii) 1.5 m Single Leg Extension                                                                                                                                                                                                                                                                  | No.   | 4   |  |  |  |  |  |  |  |  |  |
|          | (iii) 3.0 m Single Leg Extension                                                                                                                                                                                                                                                                 | No.   | 12  |  |  |  |  |  |  |  |  |  |
|          | (iv) 4.5 m Single Leg Extension                                                                                                                                                                                                                                                                  | No.   | 12  |  |  |  |  |  |  |  |  |  |
|          | (v) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                   | No.   | 12  |  |  |  |  |  |  |  |  |  |
|          | (vi) 4.5 m Body Extension                                                                                                                                                                                                                                                                        | No.   | 1   |  |  |  |  |  |  |  |  |  |
|          | (vii) 9.0 m Body Extension                                                                                                                                                                                                                                                                       | No.   | 2   |  |  |  |  |  |  |  |  |  |
|          | (viii) Stubs                                                                                                                                                                                                                                                                                     | No.   | 32  |  |  |  |  |  |  |  |  |  |
|          | (b) <u>Tower Type "AGM"</u>                                                                                                                                                                                                                                                                      |       |     |  |  |  |  |  |  |  |  |  |
|          | (i) Basic Tower Body                                                                                                                                                                                                                                                                             | No.   | 3   |  |  |  |  |  |  |  |  |  |

|   |                                                              |                              |     |       |  |  |  |  |  |  |  |  |  |
|---|--------------------------------------------------------------|------------------------------|-----|-------|--|--|--|--|--|--|--|--|--|
|   | (ii)                                                         | 1.5 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|   | (iii)                                                        | 3.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|   | (iv)                                                         | 4.5 m Single Leg Extension   | No. | 8     |  |  |  |  |  |  |  |  |  |
|   | (v)                                                          | 6.0 m Single Leg Extension   | No. | 8     |  |  |  |  |  |  |  |  |  |
|   | (vi)                                                         | 4.5 m Body Extension         | No. | 1     |  |  |  |  |  |  |  |  |  |
|   | (vii)                                                        | 9.0 m Body Extension         | No. | 2     |  |  |  |  |  |  |  |  |  |
|   | (viii)                                                       | Stubs                        | No. | 12    |  |  |  |  |  |  |  |  |  |
|   | (c)                                                          | <u>Tower Type "DGM"</u>      |     |       |  |  |  |  |  |  |  |  |  |
|   | (i)                                                          | Basic Tower Body             | No. | 3     |  |  |  |  |  |  |  |  |  |
|   | (ii)                                                         | 1.5 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|   | (iii)                                                        | 3.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|   | (iv)                                                         | 4.5 m Single Leg Extension   | No. | 8     |  |  |  |  |  |  |  |  |  |
|   | (v)                                                          | 6.0 m Single Leg Extension   | No. | 8     |  |  |  |  |  |  |  |  |  |
|   | (vi)                                                         | 4.5 m Body Extension         | No. | 1     |  |  |  |  |  |  |  |  |  |
|   | (vii)                                                        | 9.0 m Body Extension         | No. | 2     |  |  |  |  |  |  |  |  |  |
|   | (viii)                                                       | Stubs                        | No. | 12    |  |  |  |  |  |  |  |  |  |
|   | (d)                                                          | <u>Tower Type "TGM"</u>      |     |       |  |  |  |  |  |  |  |  |  |
|   | (i)                                                          | Basic Tower Body             | No. | -     |  |  |  |  |  |  |  |  |  |
|   | (ii)                                                         | 6.0 m Single Leg Extension   | No. | -     |  |  |  |  |  |  |  |  |  |
|   | (iii)                                                        | Stubs                        | No. | -     |  |  |  |  |  |  |  |  |  |
|   | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                              |     |       |  |  |  |  |  |  |  |  |  |
| 2 | Furnish 795 KCM ACSR "Drake" Conductor                       |                              | km  | 35.20 |  |  |  |  |  |  |  |  |  |
| 3 | Furnish                                                      |                              |     |       |  |  |  |  |  |  |  |  |  |
|   | (a)                                                          | OPGW with at least 24 fibers | km  | 5     |  |  |  |  |  |  |  |  |  |
|   | (b)                                                          | Joint boxes for OPGW         |     |       |  |  |  |  |  |  |  |  |  |
|   | (i)                                                          | OPGW-OPGW (A Type)           | No. | 1     |  |  |  |  |  |  |  |  |  |
|   | (ii)                                                         | OPGW-OPGW Cable ( B Type)    | No. | 0     |  |  |  |  |  |  |  |  |  |
|   | (iii)                                                        | OPGW-attaching Clamps        | No. | 54    |  |  |  |  |  |  |  |  |  |

|   |      |                                                                                                                                                                                                                                                          |     |      |  |  |  |  |  |  |  |  |  |
|---|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|--|--|--|--|--|--|--|--|--|
|   | (iv) | Fibre Optic Approach Cable                                                                                                                                                                                                                               | km  | -    |  |  |  |  |  |  |  |  |  |
|   | (c)  | Test Equipment, Installation and Maintenance Tools                                                                                                                                                                                                       |     | -    |  |  |  |  |  |  |  |  |  |
|   | -    | Fiber Optic Talk Set (Set comprised two units)                                                                                                                                                                                                           | Set | -    |  |  |  |  |  |  |  |  |  |
|   | -    | Fiber Optic Tool Kit                                                                                                                                                                                                                                     | Set | -    |  |  |  |  |  |  |  |  |  |
|   | -    | OTDR with range $\geq 400\text{km}$<br>Yokogawa AQ7260 or equivalent                                                                                                                                                                                     | Set | -    |  |  |  |  |  |  |  |  |  |
| 4 |      | Furnish 9.15 mm dia EHS Shieldwire                                                                                                                                                                                                                       | km  | 3.20 |  |  |  |  |  |  |  |  |  |
|   |      | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                             |     |      |  |  |  |  |  |  |  |  |  |
| 5 |      | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'SGM' as per specification drawing No. NTDC/DESIGN/01E151             | Set | 24   |  |  |  |  |  |  |  |  |  |
| 6 |      | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. NTDC/DESIGN/01E153      | Set | 6    |  |  |  |  |  |  |  |  |  |
| 7 |      | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004 | Set | 12   |  |  |  |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                               |  |     |    |  |  |  |  |  |  |  |  |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|----|--|--|--|--|--|--|--|--|
| 8  | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower types 'AGM' & 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005 |  | Set | 36 |  |  |  |  |  |  |  |  |
| 9  | Furnish Transposition Assembly Type IT(4) for tower type 'TGM' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. NTDC/DESIGN/01E152                                    |  | Set | -  |  |  |  |  |  |  |  |  |
| 10 | Furnish Double String Dead End Assemblies "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010            |  | Set | 3  |  |  |  |  |  |  |  |  |
| 11 | Furnish Double String Dead End Assemblies "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011           |  | Set | 3  |  |  |  |  |  |  |  |  |
|    | <b><u>Hardware for OPGW &amp; Shieldwire</u></b>                                                                                                                                                                                              |  |     |    |  |  |  |  |  |  |  |  |
| 12 | Furnish Suspension Assembly for OPGW including AGS clamp for single circuit tower type 'SGM' & 'TGM' as per specification                                                                                                                     |  | Set | 8  |  |  |  |  |  |  |  |  |
| 13 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification                                                                                                                                                      |  | Set | 1  |  |  |  |  |  |  |  |  |
| 14 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification                                                                                                                                         |  | Set | 6  |  |  |  |  |  |  |  |  |
| 15 | Overhead shield wire suspension assembly for tower type 'SGM' & 'TGM' as per specification drawing                                                                                                                                            |  | Set | 8  |  |  |  |  |  |  |  |  |



|    |                                                                                                                                                                          |       |     |  |  |  |  |  |  |  |  |   |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|--|--|--|--|--|--|--|--|---|
| 16 | Overhead shieldwire dead end assembly for tower type 'AGM' & 'DGM' as per specification drawing                                                                          | Set   | 12  |  |  |  |  |  |  |  |  |   |
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |       |     |  |  |  |  |  |  |  |  |   |
| 17 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 | No.   | 12  |  |  |  |  |  |  |  |  |   |
| 18 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      | No.   | 6   |  |  |  |  |  |  |  |  |   |
| 19 | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No.   | 185 |  |  |  |  |  |  |  |  |   |
| 20 | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No.   | 331 |  |  |  |  |  |  |  |  |   |
| 21 | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor                                                                                               | No.   | 83  |  |  |  |  |  |  |  |  |   |
| 22 | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No.   | 42  |  |  |  |  |  |  |  |  |   |
| 23 | Furnish stock bridge vibration dampers for Shield Wire                                                                                                                   | No.   | 42  |  |  |  |  |  |  |  |  |   |
| 24 | Compression splice for 9.15 mm dia EHS Shield Wire                                                                                                                       | No.   | 1   |  |  |  |  |  |  |  |  |   |
|    | <b><u>Grounding Material</u></b>                                                                                                                                         |       |     |  |  |  |  |  |  |  |  |   |
| 25 | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            | No.   | 28  |  |  |  |  |  |  |  |  |   |
| 26 | Furnish flat to cable connector.                                                                                                                                         | No.   | 28  |  |  |  |  |  |  |  |  |   |
| 27 | Furnish cable to rod connector.                                                                                                                                          | No.   | 28  |  |  |  |  |  |  |  |  |   |
| 28 | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             | Meter | 84  |  |  |  |  |  |  |  |  |   |
|    | <b>Sub-Total of G :</b>                                                                                                                                                  |       |     |  |  |  |  |  |  |  |  | - |
|    | Total of Item A                                                                                                                                                          |       |     |  |  |  |  |  |  |  |  | - |
|    | Total of Item B                                                                                                                                                          |       |     |  |  |  |  |  |  |  |  | - |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                 |  |  |  |  |  |  |  |   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--|--|--|--|--|--|--|---|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Total of Item C |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Total of Item D |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Total of Item E |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Total of Item F |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Total of Item G |  |  |  |  |  |  |  | - |
| <b>Grand Total of column No. 11 &amp; 12 to be carried forward to Grand summary</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                 |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                 |  |  |  |  |  |  |  |   |
| <p>* The Bidder shall specify the type of insulator being offered.</p> <p><b>Notes:</b></p> <p>1 Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types SGM, AGM, DGM, and TGM, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly.</p> <p>2 The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.</p> <p>3 The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.</p> <p>4 The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.</p> <p>5 The bidder shall be responsible to furnish the tower material, Shield Wire, OPGW, conductor, insulators, accessories, dampers &amp; hardware for conductor and OPGW, for completion of line in all respect. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.</p> <p>6 The contractor shall transport, unload and stack leftover/additional material from site to NTDC designated Warehouse/Store at its own cost.</p> <p>7 Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.</p> <p>8 The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully before filling up the schedule of prices.</p> |                 |  |  |  |  |  |  |  |   |

- |    |                                                                                                                               |
|----|-------------------------------------------------------------------------------------------------------------------------------|
| 9  | Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.                                 |
| 10 | Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.     |
| 11 | In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly. |

**Signature of  
Bidder**

| <b>Design, Manufacture, Procurement, Supply, Laying, Installation, Testing &amp; Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme</b><br><b>Lot-VII: 500 kV S/C C5-Ludewala —Section A (Approx. 30 km)</b> |                                                                                                                                                                                                                                                                                                  |      |          |                |           |                 |                             |                |                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------|----------------|-----------|-----------------|-----------------------------|----------------|--------------------------------------|
| <b><u>SCHEDULE NO.2- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM WITHIN PAKISTAN</u></b>                                                                                                                                           |                                                                                                                                                                                                                                                                                                  |      |          |                |           |                 |                             |                |                                      |
| Item No.                                                                                                                                                                                                                             | Description                                                                                                                                                                                                                                                                                      | Unit | Quantity | Unit Price     |           | Total EXW Price | Total Inland Transportation | Total Price    | Sales and other Taxes & Duties (PKR) |
|                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  |      |          | Local Currency | EXW Price |                 |                             | Local Currency |                                      |
| 1                                                                                                                                                                                                                                    | 2                                                                                                                                                                                                                                                                                                | 3    | 4        | 5              | 6         | 7 = 4 x 6       | 8                           | 9 = 7+ 8       | 10                                   |
|                                                                                                                                                                                                                                      | <b><u>500kV Single Circuit Transmission Line</u></b>                                                                                                                                                                                                                                             |      |          |                |           |                 |                             |                |                                      |
| A                                                                                                                                                                                                                                    | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                       |      |          |                |           |                 |                             |                |                                      |
| 1                                                                                                                                                                                                                                    | Furnish 500kV Single circuit towers SGM, AGM ,DGM & TGM including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |      |          |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                                      | (a) <u>Tower Type "SGM"</u>                                                                                                                                                                                                                                                                      |      |          |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                                      | (i) Basic Tower Body                                                                                                                                                                                                                                                                             | No.  | 75       |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                                      | (ii) 1.5 m Single Leg Extension                                                                                                                                                                                                                                                                  | No.  | -        |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                                      | (iii) 3.0 m Single Leg Extension                                                                                                                                                                                                                                                                 | No.  | 60       |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                                      | (iv) 4.5 m Single Leg Extension                                                                                                                                                                                                                                                                  | No.  | 120      |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                                      | (v) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                   | No.  | 120      |                |           |                 |                             |                |                                      |
|                                                                                                                                                                                                                                      | (vi) 4.5 m Body Extension                                                                                                                                                                                                                                                                        | No.  | 10       |                |           |                 |                             |                |                                      |

|          |                                                              |                            |     |     |  |  |  |  |  |  |
|----------|--------------------------------------------------------------|----------------------------|-----|-----|--|--|--|--|--|--|
|          | (vii)                                                        | 9.0 m Body Extension       | No. | 10  |  |  |  |  |  |  |
|          | (viii)                                                       | Stubs                      | No. | 300 |  |  |  |  |  |  |
| (b)      | <u>Tower Type "AGM"</u>                                      |                            |     |     |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body           | No. | 13  |  |  |  |  |  |  |
|          | (ii)                                                         | 1.5 m Single Leg Extension | No. | -   |  |  |  |  |  |  |
|          | (iii)                                                        | 3.0 m Single Leg Extension | No. | 12  |  |  |  |  |  |  |
|          | (iv)                                                         | 4.5 m Single Leg Extension | No. | 20  |  |  |  |  |  |  |
|          | (v)                                                          | 6.0 m Single Leg Extension | No. | 20  |  |  |  |  |  |  |
|          | (vi)                                                         | 4.5 m Body Extension       | No. | 2   |  |  |  |  |  |  |
|          | (vii)                                                        | 9.0 m Body Extension       | No. | 3   |  |  |  |  |  |  |
|          | (viii)                                                       | Stubs                      | No. | 52  |  |  |  |  |  |  |
| (c)      | <u>Tower Type "DGM"</u>                                      |                            |     |     |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body           | No. | 18  |  |  |  |  |  |  |
|          | (ii)                                                         | 1.5 m Single Leg Extension | No. | -   |  |  |  |  |  |  |
|          | (iii)                                                        | 3.0 m Single Leg Extension | No. | 16  |  |  |  |  |  |  |
|          | (iv)                                                         | 4.5 m Single Leg Extension | No. | 28  |  |  |  |  |  |  |
|          | (v)                                                          | 6.0 m Single Leg Extension | No. | 28  |  |  |  |  |  |  |
|          | (vi)                                                         | 4.5 m Body Extension       | No. | 4   |  |  |  |  |  |  |
|          | (vii)                                                        | 9.0 m Body Extension       | No. | 4   |  |  |  |  |  |  |
|          | (viii)                                                       | Stubs                      | No. | 72  |  |  |  |  |  |  |
| (d)      | <u>Tower Type "TGM"</u>                                      |                            |     |     |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body           | No. | -   |  |  |  |  |  |  |
|          | (ii)                                                         | 6.0 m Single Leg Extension | No. | -   |  |  |  |  |  |  |
|          | (iii)                                                        | Stubs                      | No. | -   |  |  |  |  |  |  |
|          | <b>Sub-Total A :</b>                                         |                            |     |     |  |  |  |  |  |  |
| <b>B</b> | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                            |     |     |  |  |  |  |  |  |
| 1        | Furnish 795 KCM ACSR "Drake" Conductor                       |                            | km  | 368 |  |  |  |  |  |  |
| 2        | Furnish                                                      |                            |     |     |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                      |                                                                |     |     |  |  |  |  |  |  |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-----|-----|--|--|--|--|--|--|
|          | (a)                                                                                                                                                                                                                                                  | OPGW with at least 24 fibers                                   | km  | 35  |  |  |  |  |  |  |
|          | (b)                                                                                                                                                                                                                                                  | Joint boxes for OPGW                                           |     |     |  |  |  |  |  |  |
|          | (i)                                                                                                                                                                                                                                                  | OPGW-OPGW (A Type)                                             | No. | 7   |  |  |  |  |  |  |
|          | (ii)                                                                                                                                                                                                                                                 | OPGW-OPGW Cable ( B Type)                                      | No. | 2   |  |  |  |  |  |  |
|          | (iii)                                                                                                                                                                                                                                                | OPGW-attaching Clamps                                          | No. | 540 |  |  |  |  |  |  |
|          | (iv)                                                                                                                                                                                                                                                 | Fibre Optic Approach Cable                                     | km  | 3   |  |  |  |  |  |  |
|          | (c)                                                                                                                                                                                                                                                  | Test Equipment, Installation and Maintenance Tools             |     | -   |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                    | Fiber Optic Talk Set (Set comprised two units)                 | Set | 1   |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                    | Fiber Optic Tool Kit                                           | Set | 1   |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                    | OTDR with range $\geq 400$ km<br>Yokogawa AQ7260 or equivalent | Set | 1   |  |  |  |  |  |  |
| 3        |                                                                                                                                                                                                                                                      | Furnish 9.15 mm dia EHS Shieldwire                             | km  | 32  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                      |                                                                |     |     |  |  |  |  |  |  |
|          | <b>Sub Total B :</b>                                                                                                                                                                                                                                 |                                                                |     |     |  |  |  |  |  |  |
| <b>C</b> | <b><u>Insulator Hardware Assemblies</u></b><br><b><u>(Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                        |                                                                |     |     |  |  |  |  |  |  |
| 1        | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'SGM' & 'TGM' as per specification drawing No. NTDC/DESIGN/01E151 |                                                                | Set | 225 |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                          |     |     |  |  |  |  |  |  |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|--|--|--|--|--|--|
| 2 | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. NTDC/DESIGN/01E153      | Set | 31  |  |  |  |  |  |  |
| 3 | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x1 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004 | Set | 62  |  |  |  |  |  |  |
| 4 | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower types 'AGM' & 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005            | Set | 186 |  |  |  |  |  |  |
| 5 | Furnish Transposition Assembly Type IT(4) for tower type 'TGM' including 25x1 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. NTDC/DESIGN/01E152                                               | Set | -   |  |  |  |  |  |  |
| 6 | Furnish Double String Dead End Assemblies "DSD1(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                       | Set | 3   |  |  |  |  |  |  |
| 7 | Furnish Double String Dead End Assemblies "DSD2(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)*                                                                                                              | Set | 3   |  |  |  |  |  |  |

|          |                                                                                                                                                                       |         |     |  |  |  |  |  |  |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|--|--|--|--|--|--|
|          | for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                                                                               |         |     |  |  |  |  |  |  |
| 8        | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assemblies (items C1 - C7) with Coulomb or ElecNET software. | Lumpsum | 1   |  |  |  |  |  |  |
|          | <b>Sub-Total C :</b>                                                                                                                                                  |         |     |  |  |  |  |  |  |
| <b>D</b> | <b><u>Hardware for OPGW &amp; Shieldwire</u></b>                                                                                                                      |         |     |  |  |  |  |  |  |
| 1        | Furnish Suspension Assembly for OPGW including AGS clamp for single circuit tower type 'SGM' & 'TGM' as per specification                                             | Set     | 75  |  |  |  |  |  |  |
| 2        | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification                                                                              | Set     | 7   |  |  |  |  |  |  |
| 3        | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification                                                                 | Set     | 31  |  |  |  |  |  |  |
| 4        | Overhead shield wire suspension assembly for tower type 'SGM' & 'TGM' as per specification drawing                                                                    | Set     | 75  |  |  |  |  |  |  |
| 5        | Overhead shieldwire dead end assembly for tower type 'AGM' & 'DGM' as per specification drawing                                                                       | Set     | 62  |  |  |  |  |  |  |
|          | <b>Sub-Total D :</b>                                                                                                                                                  |         |     |  |  |  |  |  |  |
| <b>E</b> | <b><u>Accessories and Dampers</u></b>                                                                                                                                 |         |     |  |  |  |  |  |  |
| 1        | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                              | No.     | 127 |  |  |  |  |  |  |
| 2        | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                   | No.     | 63  |  |  |  |  |  |  |



|          |                                                                                                                                                                                                                                                                                                  |       |       |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|--|--|--|--|--|--|
| 3        | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor.                                                                                                                         | No.   | 845   |  |  |  |  |  |  |
| 4        | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                                                                                                                                        | No.   | 2,317 |  |  |  |  |  |  |
| 5        | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor (See Note-3)                                                                                                                                                                                                          | No.   | 579   |  |  |  |  |  |  |
| 6        | Furnish stock bridge vibration dampers for OPGW.                                                                                                                                                                                                                                                 | No.   | 286   |  |  |  |  |  |  |
| 7        | Furnish stock bridge vibration dampers for Shield Wire.                                                                                                                                                                                                                                          | No.   | 286   |  |  |  |  |  |  |
| 8        | Compression splice for 9.15mm dia EHS Shield Wire                                                                                                                                                                                                                                                | No.   | 10    |  |  |  |  |  |  |
|          | <b>Sub-Total E :</b>                                                                                                                                                                                                                                                                             |       |       |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  |       |       |  |  |  |  |  |  |
| <b>F</b> | <b><u>Grounding Material</u></b>                                                                                                                                                                                                                                                                 |       |       |  |  |  |  |  |  |
| 1        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                                                                                                                                                    | No.   | 212   |  |  |  |  |  |  |
| 2        | Furnish flat to cable connector.                                                                                                                                                                                                                                                                 | No.   | 212   |  |  |  |  |  |  |
| 3        | Furnish cable to rod connector.                                                                                                                                                                                                                                                                  | No.   | 212   |  |  |  |  |  |  |
| 4        | Furnish 7 No. 10 copper covered ground wire.                                                                                                                                                                                                                                                     | Meter | 636   |  |  |  |  |  |  |
|          | <b>Sub-Total F :</b>                                                                                                                                                                                                                                                                             |       |       |  |  |  |  |  |  |
| <b>G</b> | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                                                                                                                                              |       |       |  |  |  |  |  |  |
| <b>1</b> | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                       |       |       |  |  |  |  |  |  |
|          | Furnish 500kV Single circuit towers SGM, AGM ,DGM & TGM including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |       |       |  |  |  |  |  |  |

|  |     |                         |                            |     |    |  |  |  |  |  |  |
|--|-----|-------------------------|----------------------------|-----|----|--|--|--|--|--|--|
|  | (a) | <u>Tower Type "SGM"</u> |                            |     |    |  |  |  |  |  |  |
|  |     | (i)                     | Basic Tower Body           | No. | 8  |  |  |  |  |  |  |
|  |     | (ii)                    | 1.5 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |
|  |     | (iii)                   | 3.0 m Single Leg Extension | No. | 12 |  |  |  |  |  |  |
|  |     | (iv)                    | 4.5 m Single Leg Extension | No. | 12 |  |  |  |  |  |  |
|  |     | (v)                     | 6.0 m Single Leg Extension | No. | 12 |  |  |  |  |  |  |
|  |     | (vi)                    | 4.5 m Body Extension       | No. | 1  |  |  |  |  |  |  |
|  |     | (vii)                   | 9.0 m Body Extension       | No. | 2  |  |  |  |  |  |  |
|  |     | (viii)                  | Stubs                      | No. | 32 |  |  |  |  |  |  |
|  | (b) | <u>Tower Type "AGM"</u> |                            |     |    |  |  |  |  |  |  |
|  |     | (i)                     | Basic Tower Body           | No. | 3  |  |  |  |  |  |  |
|  |     | (ii)                    | 1.5 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |
|  |     | (iii)                   | 3.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |
|  |     | (iv)                    | 4.5 m Single Leg Extension | No. | 8  |  |  |  |  |  |  |
|  |     | (v)                     | 6.0 m Single Leg Extension | No. | 8  |  |  |  |  |  |  |
|  |     | (vi)                    | 4.5 m Body Extension       | No. | 1  |  |  |  |  |  |  |
|  |     | (vii)                   | 9.0 m Body Extension       | No. | 2  |  |  |  |  |  |  |
|  |     | (viii)                  | Stubs                      | No. | 12 |  |  |  |  |  |  |
|  | (c) | <u>Tower Type "DGM"</u> |                            |     |    |  |  |  |  |  |  |
|  |     | (i)                     | Basic Tower Body           | No. | 3  |  |  |  |  |  |  |
|  |     | (ii)                    | 1.5 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |
|  |     | (iii)                   | 3.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |
|  |     | (iv)                    | 4.5 m Single Leg Extension | No. | 8  |  |  |  |  |  |  |
|  |     | (v)                     | 6.0 m Single Leg Extension | No. | 8  |  |  |  |  |  |  |
|  |     | (vi)                    | 4.5 m Body Extension       | No. | 1  |  |  |  |  |  |  |
|  |     | (vii)                   | 9.0 m Body Extension       | No. | 2  |  |  |  |  |  |  |
|  |     | (viii)                  | Stubs                      | No. | 12 |  |  |  |  |  |  |
|  | (d) | <u>Tower Type "TGM"</u> |                            |     |    |  |  |  |  |  |  |
|  |     | (i)                     | Basic Tower Body           | No. | -  |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                              |                                                                   |     |       |  |  |  |  |  |  |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|-----|-------|--|--|--|--|--|--|
|   | (ii)                                                                                                                                                                                                                                         | 6.0 m Single Leg Extension                                        | No. | -     |  |  |  |  |  |  |
|   | (iii)                                                                                                                                                                                                                                        | Stubs                                                             | No. | -     |  |  |  |  |  |  |
|   | <b><u>Conductor and OPGW (With Associated Equipment)</u></b>                                                                                                                                                                                 |                                                                   |     |       |  |  |  |  |  |  |
| 2 | Furnish 795 KCM ACSR "Drake" Conductor                                                                                                                                                                                                       |                                                                   | km  | 35.20 |  |  |  |  |  |  |
| 3 | Furnish                                                                                                                                                                                                                                      |                                                                   |     |       |  |  |  |  |  |  |
|   | (a)                                                                                                                                                                                                                                          | OPGW with at least 24 fibers                                      | km  | 5     |  |  |  |  |  |  |
|   | (b)                                                                                                                                                                                                                                          | Joint boxes for OPGW                                              |     |       |  |  |  |  |  |  |
|   | (i)                                                                                                                                                                                                                                          | OPGW-OPGW (A Type)                                                | No. | 1     |  |  |  |  |  |  |
|   | (ii)                                                                                                                                                                                                                                         | OPGW-OPGW Cable ( B Type)                                         | No. | 0     |  |  |  |  |  |  |
|   | (iii)                                                                                                                                                                                                                                        | OPGW-attaching Clamps                                             | No. | 54    |  |  |  |  |  |  |
|   | (iv)                                                                                                                                                                                                                                         | Fibre Optic Approach Cable                                        | km  | -     |  |  |  |  |  |  |
|   | (c)                                                                                                                                                                                                                                          | Test Equipment, Installation and Maintenance Tools                |     | -     |  |  |  |  |  |  |
|   | -                                                                                                                                                                                                                                            | Fiber Optic Talk Set (Set comprised two units)                    | Set | -     |  |  |  |  |  |  |
|   | -                                                                                                                                                                                                                                            | Fiber Optic Tool Kit                                              | Set | -     |  |  |  |  |  |  |
|   | -                                                                                                                                                                                                                                            | OTDR with range $\geq 400\text{km}$ Yokogawa AQ7260 or equivalent | Set | -     |  |  |  |  |  |  |
| 4 | Furnish 9.15 mm dia EHS Shieldwire                                                                                                                                                                                                           |                                                                   | km  | 3.20  |  |  |  |  |  |  |
|   | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                 |                                                                   |     |       |  |  |  |  |  |  |
| 5 | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'SGM' as per specification drawing No. NTDC/DESIGN/01E151 |                                                                   | Set | 24    |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                                          |     |    |  |  |  |  |  |  |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|--|--|--|--|--|--|
| 6  | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. NTDC/DESIGN/01E153      | Set | 6  |  |  |  |  |  |  |
| 7  | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004 | Set | 12 |  |  |  |  |  |  |
| 8  | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower types 'AGM' & 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005            | Set | 36 |  |  |  |  |  |  |
| 9  | Furnish Transposition Assembly Type IT(4) for tower type 'TGM' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. NTDC/DESIGN/01E152                                               | Set | -  |  |  |  |  |  |  |
| 10 | Furnish Double String Dead End Assemblies "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                       | Set | 3  |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                     |     |     |  |  |  |  |  |  |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|--|--|--|--|--|--|
| 11 | Furnish Double String Dead End Assemblies "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011 | Set | 3   |  |  |  |  |  |  |
|    | <b><u>Hardware for OPGW &amp; Shieldwire</u></b>                                                                                                                                                                                    |     |     |  |  |  |  |  |  |
| 12 | Furnish Suspension Assembly for OPGW including AGS clamp for single circuit tower type 'SGM' & 'TGM' as per specification                                                                                                           | Set | 8   |  |  |  |  |  |  |
| 13 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification                                                                                                                                            | Set | 1   |  |  |  |  |  |  |
| 14 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification                                                                                                                               | Set | 6   |  |  |  |  |  |  |
| 15 | Overhead shield wire suspension assembly for tower type 'SGM' & 'TGM' as per specification drawing                                                                                                                                  | Set | 8   |  |  |  |  |  |  |
| 16 | Overhead shieldwire dead end assembly for tower type 'AGM' & 'DGM' as per specification drawing                                                                                                                                     | Set | 12  |  |  |  |  |  |  |
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                                                                               |     |     |  |  |  |  |  |  |
| 17 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                                                                            | No. | 12  |  |  |  |  |  |  |
| 18 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                                                                                 | No. | 6   |  |  |  |  |  |  |
| 19 | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor.                                                            | No. | 185 |  |  |  |  |  |  |
| 20 | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                                                                           | No. | 331 |  |  |  |  |  |  |

|                                                           |                                                                            |       |    |  |  |  |  |  |   |
|-----------------------------------------------------------|----------------------------------------------------------------------------|-------|----|--|--|--|--|--|---|
| 21                                                        | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor | No.   | 83 |  |  |  |  |  |   |
| 22                                                        | Furnish stock bridge vibration dampers for OPGW.                           | No.   | 42 |  |  |  |  |  |   |
| 23                                                        | Furnish stock bridge vibration dampers for Shield Wire.                    | No.   | 42 |  |  |  |  |  |   |
| 24                                                        | Compression splice for 9.15 mm dia EHS Shield Wire                         | No.   | 1  |  |  |  |  |  |   |
|                                                           | <b><u>Grounding Material</u></b>                                           |       |    |  |  |  |  |  |   |
| 25                                                        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.              | No.   | 28 |  |  |  |  |  |   |
| 26                                                        | Furnish flat to cable connector.                                           | No.   | 28 |  |  |  |  |  |   |
| 27                                                        | Furnish cable to rod connector.                                            | No.   | 28 |  |  |  |  |  |   |
| 28                                                        | Furnish 7 No. 10 copper covered ground wire.                               | Meter | 84 |  |  |  |  |  |   |
|                                                           | <b>Sub-Total of G :</b>                                                    |       |    |  |  |  |  |  | - |
|                                                           | Total of Item A                                                            |       |    |  |  |  |  |  | - |
|                                                           | Total of Item B                                                            |       |    |  |  |  |  |  | - |
|                                                           | Total of Item C                                                            |       |    |  |  |  |  |  | - |
|                                                           | Total of Item D                                                            |       |    |  |  |  |  |  | - |
|                                                           | Total of Item E                                                            |       |    |  |  |  |  |  | - |
|                                                           | Total of Item F                                                            |       |    |  |  |  |  |  | - |
|                                                           | Total of Item G                                                            |       |    |  |  |  |  |  | - |
| <b>Total of Column 9 to be forwarded to Grand Summary</b> |                                                                            |       |    |  |  |  |  |  | - |
|                                                           |                                                                            |       |    |  |  |  |  |  |   |

- \* The Bidder shall specify the type of insulator being offered.

**Notes:**

- 1 Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types SGM, AGM, DGM, and TGM, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly.
- 2 The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.

- 3 The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.
- 4 The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.
- 5 The bidder shall be responsible to furnish the tower material, Shield Wire, OPGW, conductor, insulators, accessories, dampers & hardware for conductor and OPGW, for completion of line in all respect. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.
- 6 The contractor shall transport, unload and stack leftover/additional material from site to NTDC designated Warehouse/Store at its own cost.
- 7 Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.
- 8 The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully before filling up the schedule of prices.
- 9 Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.
- 10 Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.
- 11 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.

**Signature of Bidder**

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**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-VII: 500 kV S/C C5-Ludewala – Section A (Approx. 30 km)**  
**Schedule No.3 - Design Services**

| Item                                                  | Description | Qty. | Unit Price <sup>1</sup><br>Local<br>Currency | Total Price | Total<br>Provincial<br>Sales Tax |
|-------------------------------------------------------|-------------|------|----------------------------------------------|-------------|----------------------------------|
| 1                                                     | 2           | 3    | 4                                            | 5 = 3 x 4   | 6                                |
| 1                                                     |             | Lot  |                                              |             |                                  |
| NOT APPLICABLE                                        |             |      |                                              |             |                                  |
| TOTAL Column 5 to be carried forward to Grand Summary |             |      |                                              |             |                                  |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>1</sup>Specify currency in accordance ITB 12.



**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme  
Lot-VII: 500 kV S/C C5-Ludewala —Section A (Approx. 30 km)**

**SCHEDULE NO.4 - INSTALLATION AND OTHER SERVICES**

**(INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)**

| Item No.                                                                                  | Description                 | Unit     | Qty | Unit Price (PKR) | Total Price (PKR) Including all Custom duties, taxes and other levies etc. w/o Provincial Sales Tax | Total Provincial Sales tax (PST) in PKR |
|-------------------------------------------------------------------------------------------|-----------------------------|----------|-----|------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------|
| 1                                                                                         | 2                           | 3        | 4   | 5                | 6=4*5                                                                                               | 7                                       |
| <b>INSTALLATION (INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)</b> |                             |          |     |                  |                                                                                                     |                                         |
| <b>A</b>                                                                                  | <b><u>Survey</u></b>        |          |     |                  |                                                                                                     |                                         |
| 1                                                                                         | Clearing Right of Way (ROW) | Lump Sum | 1   |                  |                                                                                                     |                                         |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |    |  |  |  |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----|--|--|--|
| 2        | Validation of already established centre line prior to foundation construction and preparation of as-built plan & profile drawings of the already prepared plan & profile drawings using PLS-CADD and construction structure lists (to be provided to the Contractor after award of contract) of the constructed transmission line after incorporating all the changes and submitted to the Project Manager. In case of route diversion, payment of the diverted portion will be made as per item A.3 | km        | 30 |  |  |  |
| 3        | Route alignment and detailed surveying of diverted portion not limited to chainage and leveling, preparation of plan & profile drawings, spotting of towers and preparation of construction structure list & Latitude & Longitude with hand held GPS of each tower location                                                                                                                                                                                                                           | km        | 3  |  |  |  |
|          | <b>Sub-Total A:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |    |  |  |  |
| <b>B</b> | <b><u>Sub-soil Investigations:</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |    |  |  |  |
|          | Sub-Soil Investigation for T/Line at (ii) and confirmatory sub-soil Investigation in varied soil/boulder/rock (including laboratory tests) as per Specifications (Technical Provisions for Construction Clause 10.2) and submission of Sub-Soil Investigation Report.                                                                                                                                                                                                                                 |           |    |  |  |  |
| (a)      | From NSL to depth of 15 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Lin. Mtr. | 45 |  |  |  |
| (b)      | From 15 m to depth of 25 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Lin. Mtr. | 10 |  |  |  |
| (c)      | Hand Auger upto depth of 10m                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Lin. Mtr. | 30 |  |  |  |
|          | <b>Sub-Total B:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |    |  |  |  |
| <b>C</b> | <b><u>Foundations</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |    |  |  |  |

|          |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |    |  |  |  |
|----------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----|--|--|--|
|          |                                | Reinforced Concrete Spread Foundations (4 legs) complete in all respect in varied soil as well as boulders/rock complete with supply of materials including alignment, peg marking, access, preparatory works, excavation, blasting, leveling, grading of tower site, cutting, dewatering, shuttering, reinforcement, concreting (using Sulphate Resistance Cement conforming to ASTM C-150 Type-V), lean concrete (if required), curing, backfilling of foundations after concreting with excavated/borrowed earth (irrespective of lead), application of three (03) coats hot bitumen (ExpanProof* 10 – Fospak bitumen and compaction of backfill material in layers, stub setting and site restoration etc. including tower staking (Latitude & Longitude with hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type as per drawings and specifications: |            |    |  |  |  |
|          | (a)                            | SGM (Complete Foundation 4 Legs) as per Drawing No. 3206/169/TD/01G100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |    |  |  |  |
|          | (i)                            | Foundation Type D0 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 5  |  |  |  |
|          | (ii)                           | Foundation Type D1 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 50 |  |  |  |
|          | (iii)                          | Foundation Type S1 (Semi-Submerged)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Foundation | 3  |  |  |  |
|          | (iv)                           | Foundation Type S (Semi-Submerged)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Foundation | 3  |  |  |  |
|          | (v)                            | Foundation Type D2 (Dry) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            | 0  |  |  |  |
|          | (b)                            | AGM (Complete Foundation 4 Legs) as per Drawing No. 3206/169/TD/01G101                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |    |  |  |  |
|          | (i)                            | Foundation Type D0 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 2  |  |  |  |
|          | (ii)                           | Foundation Type D1 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 4  |  |  |  |
|          | (iii)                          | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Foundation | 0  |  |  |  |
|          | (c)                            | DGM (Complete Foundation 4 Legs) as per Drawing No. 3206/169/TD/01G102                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |    |  |  |  |
|          | (i)                            | Foundation Type D0 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 2  |  |  |  |
|          | (ii)                           | Foundation Type D1 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 2  |  |  |  |
|          | (iii)                          | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Foundation | 0  |  |  |  |
|          | <b>Sub-Total C:</b>            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |    |  |  |  |
| <b>D</b> | <b><u>Pile Foundations</u></b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |    |  |  |  |

|  |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |          |  |  |  |
|--|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|--|--|--|
|  | D-1  | Reinforced concrete pile foundations (cast in situ installation) complete in all type of soil as well as boulders/gravels/rock with supply of materials including excavation, drilling/boring, shuttering, reinforcement, concreting, bitumen coating, backfilling, installation of Stubs, tower grounding, site clearing etc. using Sulphate Resistance Cement conforming to ASTM C-150 Type-V shall be used including tower staking (Latitude & Longitude with RTK/hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type: |            |          |  |  |  |
|  | (a)  | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, SGM, and drawing No. <b>3206/169/TD/01G110</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Foundation | <b>3</b> |  |  |  |
|  | (b)  | Reinforced concrete single pile per footing 900 mm dia. as per drawing No. <b>3206/169/TD/01G110</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |          |  |  |  |
|  | (i)  | Pile shaft upto depth of 10 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Lin.mtr    | 120      |  |  |  |
|  | (c)  | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, AGM, and drawing No. <b>3206/169/TD/01G111</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Foundation | <b>2</b> |  |  |  |
|  | (d)  | Reinforced concrete single pile per footing 900 mm dia. as per drawing No. <b>3206/169/TD/01G111</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |          |  |  |  |
|  | (i)  | Pile shaft upto depth of 15 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Lin.mtr    | 120      |  |  |  |
|  | (ii) | Pile shaft depth 15 - 20 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lin.mtr    | 20       |  |  |  |
|  | (e)  | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DGM, and drawing No. <b>3206/169/TD/01G112</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Foundation | <b>4</b> |  |  |  |
|  | (f)  | Reinforced concrete single pile per footing 1200 mm dia. as per drawing No. <b>3206/169/TD/01G112</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |          |  |  |  |

|          |                                                                                                                                                                                                                                                            |       |                                                                                                                                                        |            |       |  |  |  |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------|--|--|--|
|          |                                                                                                                                                                                                                                                            | (i)   | Pile shaft upto depth of 15 m                                                                                                                          | Lin.mtr    | 240   |  |  |  |
|          |                                                                                                                                                                                                                                                            | (ii)  | Pile shaft depth 15 - 20 m                                                                                                                             | Lin.mtr    | 40    |  |  |  |
|          | D-2                                                                                                                                                                                                                                                        |       | Pile load test in compression confirming to ASTM D1143 / D1143M and in uplift confirming to ASTM D3689 / D3689M at 2.5 times of tower foundation loads |            |       |  |  |  |
|          |                                                                                                                                                                                                                                                            | (i)   | DGM (In Compression)                                                                                                                                   | Pile       | 1     |  |  |  |
|          |                                                                                                                                                                                                                                                            | (ii)  | DGM (In Tension/Uplift)                                                                                                                                | Pile       | 1     |  |  |  |
|          |                                                                                                                                                                                                                                                            | (iii) | Reinforced concrete single Test pile per footing 1200 mm dia. as per drawing No. 3206/169/TD/01G112 (including steel liner/casing), if required.       |            | 2     |  |  |  |
|          |                                                                                                                                                                                                                                                            | (a)   | Pile shaft upto depth of 15 m                                                                                                                          | Lin.mtr    | 30    |  |  |  |
|          |                                                                                                                                                                                                                                                            | (b)   | Pile shaft depth 15 - 20 m                                                                                                                             | Lin.mtr    | 10    |  |  |  |
|          | D-3                                                                                                                                                                                                                                                        |       | Sonic Integrity Test at pile foundation confirming to ASTM D5882                                                                                       | No.        | 9     |  |  |  |
|          | <b>Sub-Total D:</b>                                                                                                                                                                                                                                        |       |                                                                                                                                                        |            |       |  |  |  |
| <b>E</b> | <b><u>Erection of Steel Towers</u></b>                                                                                                                                                                                                                     |       |                                                                                                                                                        |            |       |  |  |  |
| 1        | Transport and Install 500kV single circuit towers type SGM, AGM, DGM & TGM with all accessories i.e anti climbing devices, aerial markers number plates, danger signs, phase plates, Bird Guards etc. in accordance with requirements of Bidding Documents |       |                                                                                                                                                        | Ton        | 1,225 |  |  |  |
| 2        | Welding of erected tower bolts & nuts after final inspection upto height of 8.0 m from top of foundation chimney as per specification drawing                                                                                                              |       |                                                                                                                                                        | Each tower | 106   |  |  |  |
|          | <b>Sub-Total E:</b>                                                                                                                                                                                                                                        |       |                                                                                                                                                        |            |       |  |  |  |

|          |                                                                                                                                                                                                                                                                                               |                    |      |  |  |  |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------|--|--|--|
| <b>F</b> | <b><u>Stringing of Conductor and OPGW</u></b>                                                                                                                                                                                                                                                 |                    |      |  |  |  |
| 1        | Transport & Install 795KCM ACSR Drake for quad conductor configuration insulator hanging, hardware assemblies, accessories & dampers etc. complete in all respects as per specifications & approved drawings and methodology.                                                                 | km D/C Quad Bundle | 30   |  |  |  |
| 2        | Transport & Install OPGW & Shield Wire including installation of drop down lengths for joint boxes at the towers along with allied hardware material including hardware assemblies, joint boxes accessories, dampers etc. complete in all respects as per specifications & approved drawings. | km (on Both Peaks) | 30   |  |  |  |
|          | <b>Sub-Total F:</b>                                                                                                                                                                                                                                                                           |                    |      |  |  |  |
| <b>G</b> | <b><u>Testing &amp; Commissioning</u></b>                                                                                                                                                                                                                                                     |                    |      |  |  |  |
| 1        | Testing and commissioning of the line                                                                                                                                                                                                                                                         | Lumpsum            | 1    |  |  |  |
|          | <b>Sub-Total G:</b>                                                                                                                                                                                                                                                                           |                    |      |  |  |  |
| <b>H</b> | <b><u>ENVIRONMENTAL AND SOCIAL SAFEGUARDS</u></b>                                                                                                                                                                                                                                             |                    |      |  |  |  |
| 1        | Tree Plantation (Minimum height 4 feet)                                                                                                                                                                                                                                                       | No.                | 3000 |  |  |  |
| 2        | Water quality monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route.                                                                                                                                                          | No.                | 28   |  |  |  |
| 3        | Ambient Air monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route.                                                                                                                                                            | No.                | 28   |  |  |  |
| 4        | Noise monitoring / analysis / measurement on quarterly basis for the whole project period at three locations along the TL route.                                                                                                                                                              | No.                | 28   |  |  |  |
|          | <b>Sub-Total H:</b>                                                                                                                                                                                                                                                                           |                    |      |  |  |  |
| <b>I</b> | <b><u>INSTALLATION SERVICES FOR ADDITIONAL WORK</u></b>                                                                                                                                                                                                                                       |                    |      |  |  |  |
| 1        | Grading/Cutting/Excavation (Dry Soil)                                                                                                                                                                                                                                                         | Cu. m.             | 50   |  |  |  |

|                                                                |                                                                             |        |      |  |  |  |
|----------------------------------------------------------------|-----------------------------------------------------------------------------|--------|------|--|--|--|
| 2                                                              | Excavation (semi-submerged soil)                                            | Cu. m. | 35   |  |  |  |
| 3                                                              | Excavation (submerged soil)                                                 | Cu. m. | 40   |  |  |  |
| 4                                                              | Blasting/Cutting/Excavation/Grading (boulder/Rock)                          | Cu. m. | 50   |  |  |  |
| 5                                                              | Concrete (3000 psi at 28 days) furnished and installed                      | Cu. m. | 100  |  |  |  |
| 6                                                              | Concrete (4000 psi at 28 days) furnished and installed                      | Cu. m. | 25   |  |  |  |
| 7                                                              | Reinforcing Bars furnished and installed (Grade-60)                         | kg     | 1000 |  |  |  |
| 8                                                              | Overhaul from Borrow and Compaction (regardless of the distance for borrow) | Cu. m. | 100  |  |  |  |
| 9                                                              | Lean concrete furnished and installed (2000 psi strength at 28 days)        | Cu. m. | 70   |  |  |  |
| 10                                                             | Compacted crush+sand (50:50 ratio) installed under footings                 | Cu. m. | 50   |  |  |  |
| 11                                                             | Bitumen coating for footing                                                 | Sq. m  | 50   |  |  |  |
| 12                                                             | Compacted Backfill                                                          | Cu. m. | 100  |  |  |  |
|                                                                | <b>Sub-Total I:</b>                                                         |        |      |  |  |  |
|                                                                | <b>Total of Item A</b>                                                      |        |      |  |  |  |
|                                                                | <b>Total of Item B</b>                                                      |        |      |  |  |  |
|                                                                | <b>Total of Item C</b>                                                      |        |      |  |  |  |
|                                                                | <b>Total of Item D</b>                                                      |        |      |  |  |  |
|                                                                | <b>Total of Item E</b>                                                      |        |      |  |  |  |
|                                                                | <b>Total of Item F</b>                                                      |        |      |  |  |  |
|                                                                | <b>Total of Item G</b>                                                      |        |      |  |  |  |
|                                                                | <b>Total of Item H</b>                                                      |        |      |  |  |  |
|                                                                | <b>Total of Item I</b>                                                      |        |      |  |  |  |
| <b>Total (Column 6) to be carried forward to Grand Summary</b> |                                                                             |        |      |  |  |  |
| <b><u>Notes:</u></b>                                           |                                                                             |        |      |  |  |  |

- 1 The quantities mentioned in the BOQ are estimated quantities. These quantities are to be used for bid evaluation purpose only. The actual quantities may vary depending upon detailed engineering and approved drawings. However, the unit rates for material and service quoted in the BOQ/ bid shall remain firm and final if design is unchanged.
- 2 Price of any other item specifically not covered in the Price Schedules but is required for the completion, commissioning and operation of the transmission line shall be deemed to be included in the Price Schedules.
- 3 In case of failure by the bidder to fill the price of Sales Tax in relevant column, the quoted price of the bidder will be considered inclusive of Sales Tax applicable as per Lax and relevant provisions of the Bidding Documents. In case the bidder takes deviation or mention that prices are exclusive of PST, his bid shall be considered as non-responsive.
- 4 Foundation means four legs of tower.
- 5 An allowance of two percent (2%) of the total installed quantity will be permitted for sag, jumpers and wastage for the conductor and shield wire, one percent (1%) for OPGW and two percent (2%) for lossage of nuts, bolts and washers (for towers only); and one percent (1%) for insulator breakage. These allowances are the maximum permissible and in case of wastage less than these limits all excess material shall be returned to NGC storage yards by the Contractor. For quantities in excess of these limits, the Contractor shall replace or reimburse NGC for the loss. All unused, above allowable limits of waste materials and packing wood are the property of NGC and shall be returned to NGC storage yards by the Contractor.
- 6 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.
- 7 The Bidder shall quote prices against all items, including those for which the specified quantity is "0". No item shall be left blank or unpriced in the Price Schedule.
- 8 Pile Foundation design will be release after the submission of Pile load test Report.
- 9 Location for Sonic Integrity and sonic integrity test report approval will be accorded by the office of DG (C&SE) NGC.

**Name of  
Bidder**

**Signature  
of Bidder**



**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme**  
**Lot-VII: 500 kV S/C C5-Ludewala —Section A (Approx. 30 km)**

**SCHEDULE NO. 5 - GRAND SUMMARY**

| Sr. No.                                                         | Description                                                                                      | Bid Prices                 |                                |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------|--------------------------------|
|                                                                 |                                                                                                  | Foreign Currency Component | Local Currency Component (PKR) |
| 1                                                               | Total Schedule No. 1 Plant and Mandatory Spare Parts Supplied from Abroad                        |                            | -                              |
| 2                                                               | Total Schedule No. 2 Plant and Mandatory Spare Parts Supplied from Within the Employer's Country |                            |                                |
| 3                                                               | Total Schedule No. 3 Design Services                                                             | -                          |                                |
| 4                                                               | Total Schedule No. 4 Installation and Other Services                                             |                            |                                |
| 5                                                               | Provisional Sum                                                                                  | -                          | 1,060 Million                  |
| <b>GRAND TOTAL to be carried forward to Letter of Price Bid</b> |                                                                                                  |                            |                                |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

- 1 Specify the currency in accordance with ITB 12 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-VII: 500 kV S/C C5-Ludewala – Section A (Approx. 30 km)**

**Schedule No. 6 - Recommended Spare Parts**

| Item | Description    | Qty | Unit Price                              |                                                 | Total Price                  |                                |
|------|----------------|-----|-----------------------------------------|-------------------------------------------------|------------------------------|--------------------------------|
|      |                |     | EXW<br>Local Parts<br>Local<br>Currency | CIP<br>Imported<br>Parts<br>Foreign<br>Currency | Local<br>Currency<br>Portion | Foreign<br>Currency<br>Portion |
| 1    | 2              | 3   | 4                                       | 5                                               | 6 = 3 x 4                    | 7 = 3 x 5                      |
|      | NOT APPLICABLE |     |                                         |                                                 |                              |                                |
|      |                |     |                                         |                                                 |                              |                                |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

# **Schedules of Rates and Prices**

## **(LOT-VIII)**

| Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme |                                                                                                                                                                                                                                                                                                  |                         |                            |      |          |                                   |           |                                    |           |                             |                                |          |                |
|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------|------|----------|-----------------------------------|-----------|------------------------------------|-----------|-----------------------------|--------------------------------|----------|----------------|
| Lot-VIII: 500 kV S/C C5-Ludewala —Section B (Approx. 32 km)                                                                                          |                                                                                                                                                                                                                                                                                                  |                         |                            |      |          |                                   |           |                                    |           |                             |                                |          |                |
| SCHEDULE NO.1- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM ABROAD                                                                                  |                                                                                                                                                                                                                                                                                                  |                         |                            |      |          |                                   |           |                                    |           |                             |                                |          |                |
| Item No.                                                                                                                                             | Description                                                                                                                                                                                                                                                                                      |                         | Code Country of Origin     | Unit | Quantity | Unit Price (CIF Pakistan Seaport) |           | Total Price (CIF Pakistan Seaport) |           | Total Inland Transportation | Total Price CIP (Project Site) |          | Taxes & Duties |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  |                         |                            |      |          | CFR                               | Insurance | CFR                                | Insurance |                             | FCC                            | LCC      | Local Currency |
| 1                                                                                                                                                    | 2                                                                                                                                                                                                                                                                                                |                         | 3                          | 4    | 5        | 6                                 | 7         | 8=5 x 6                            | 9 = 5 x 7 | 10                          | 11=8                           | 12= 9+10 | 13             |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  |                         |                            |      |          |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      | <u>500kV Single Circuit Transmission Line</u>                                                                                                                                                                                                                                                    |                         |                            |      |          |                                   |           |                                    |           |                             |                                |          |                |
| A                                                                                                                                                    | <u>Steel Towers</u>                                                                                                                                                                                                                                                                              |                         |                            |      |          |                                   |           |                                    |           |                             |                                |          |                |
| 1                                                                                                                                                    | Furnish 500kV Single circuit towers SGM, AGM ,DGM & TGM including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                         |                            |      |          |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      | (a)                                                                                                                                                                                                                                                                                              | <u>Tower Type "SGM"</u> |                            |      |          |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (i)                     | Basic Tower Body           |      | No.      | 76                                |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (ii)                    | 1.5 m Single Leg Extension |      | No.      | -                                 |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (iii)                   | 3.0 m Single Leg Extension |      | No.      | 60                                |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (iv)                    | 4.5 m Single Leg Extension |      | No.      | 120                               |           |                                    |           |                             |                                |          |                |

|     |                         |                            |     |     |  |  |  |  |  |  |  |  |  |
|-----|-------------------------|----------------------------|-----|-----|--|--|--|--|--|--|--|--|--|
|     | (v)                     | 6.0 m Single Leg Extension | No. | 124 |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 4.5 m Body Extension       | No. | 10  |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | 9.0 m Body Extension       | No. | 10  |  |  |  |  |  |  |  |  |  |
|     | (viii)                  | Stubs                      | No. | 304 |  |  |  |  |  |  |  |  |  |
| (b) | <u>Tower Type "AGM"</u> |                            |     |     |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 14  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 1.5 m Single Leg Extension | No. | -   |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 3.0 m Single Leg Extension | No. | 12  |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 4.5 m Single Leg Extension | No. | 20  |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 6.0 m Single Leg Extension | No. | 24  |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 4.5 m Body Extension       | No. | 3   |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | 9.0 m Body Extension       | No. | 3   |  |  |  |  |  |  |  |  |  |
|     | (viii)                  | Stubs                      | No. | 56  |  |  |  |  |  |  |  |  |  |
| (c) | <u>Tower Type "DGM"</u> |                            |     |     |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 15  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 1.5 m Single Leg Extension | No. | -   |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 3.0 m Single Leg Extension | No. | 12  |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 4.5 m Single Leg Extension | No. | 24  |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 6.0 m Single Leg Extension | No. | 24  |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 4.5 m Body Extension       | No. | 3   |  |  |  |  |  |  |  |  |  |

|                      |                                                              |                                                    |     |        |  |  |  |  |  |  |  |  |  |
|----------------------|--------------------------------------------------------------|----------------------------------------------------|-----|--------|--|--|--|--|--|--|--|--|--|
|                      | (vii)                                                        | 9.0 m Body Extension                               | No. | 3      |  |  |  |  |  |  |  |  |  |
|                      | (viii)                                                       | Stubs                                              | No. | 60     |  |  |  |  |  |  |  |  |  |
| (d)                  | <u>Tower Type "TGM"</u>                                      |                                                    |     |        |  |  |  |  |  |  |  |  |  |
|                      | (i)                                                          | Basic Tower Body                                   | No. | 4      |  |  |  |  |  |  |  |  |  |
|                      | (ii)                                                         | 4.0 m Single Leg Extension                         | No. | 8      |  |  |  |  |  |  |  |  |  |
|                      | (iii)                                                        | 6.0 m Single Leg Extension                         | No. | 8      |  |  |  |  |  |  |  |  |  |
|                      | (iv)                                                         | Stubs                                              | No. | 16     |  |  |  |  |  |  |  |  |  |
| <b>Sub-Total A :</b> |                                                              |                                                    |     |        |  |  |  |  |  |  |  |  |  |
| <b>B</b>             | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                                                    |     |        |  |  |  |  |  |  |  |  |  |
| 1                    | Furnish 795 KCM ACSR "Drake" Conductor                       |                                                    | km  | 390.40 |  |  |  |  |  |  |  |  |  |
| 2                    | Furnish                                                      |                                                    |     |        |  |  |  |  |  |  |  |  |  |
|                      | (a)                                                          | OPGW with at least 24 fibers                       | km  | 40     |  |  |  |  |  |  |  |  |  |
|                      | (b)                                                          | Joint boxes for OPGW                               |     |        |  |  |  |  |  |  |  |  |  |
|                      | (i)                                                          | OPGW-OPGW (A Type)                                 | No. | 8      |  |  |  |  |  |  |  |  |  |
|                      | (ii)                                                         | OPGW-OPGW Cable ( B Type)                          | No. | -      |  |  |  |  |  |  |  |  |  |
|                      | (iii)                                                        | OPGW-attaching Clamps                              | No. | 480    |  |  |  |  |  |  |  |  |  |
|                      | (iv)                                                         | Fibre Optic Approach Cable                         | km  | -      |  |  |  |  |  |  |  |  |  |
|                      | (c)                                                          | Test Equipment, Installation and Maintenance Tools |     | -      |  |  |  |  |  |  |  |  |  |
|                      | -                                                            | Fiber Optic Talk Set (Set comprised two units)     | Set | 1      |  |  |  |  |  |  |  |  |  |
|                      | -                                                            | Fiber Optic Tool Kit                               | Set | 1      |  |  |  |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                          |                                                                   |     |       |  |  |  |  |  |  |  |  |  |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|-----|-------|--|--|--|--|--|--|--|--|--|
|          | -                                                                                                                                                                                                                                                        | OTDR with range $\geq 400$ km<br>Yokogawa AQ7260 or<br>equivalent | Set | 1     |  |  |  |  |  |  |  |  |  |
| 3        |                                                                                                                                                                                                                                                          | Furnish 9.15 mm dia EHS Shieldwire                                | km  | 35.20 |  |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                          |                                                                   |     |       |  |  |  |  |  |  |  |  |  |
|          | <b>Sub Total B :</b>                                                                                                                                                                                                                                     |                                                                   |     |       |  |  |  |  |  |  |  |  |  |
| <b>C</b> | <b><u>Insulator Hardware Assemblies</u></b><br><b><u>(Complete Hardware Strings for Quad</u></b><br><b><u>Bundle ACSR Drake Conductor)</u></b>                                                                                                           |                                                                   |     |       |  |  |  |  |  |  |  |  |  |
| 1        | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'SGM' & TGM as per specification drawing No. NTDC/DESIGN/01E151       |                                                                   | Set | 240   |  |  |  |  |  |  |  |  |  |
| 2        | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. NTDC/DESIGN/01E153      |                                                                   | Set | 29    |  |  |  |  |  |  |  |  |  |
| 3        | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004 |                                                                   | Set | 58    |  |  |  |  |  |  |  |  |  |
| 4        | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower types 'AGM' & 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005            |                                                                   | Set | 174   |  |  |  |  |  |  |  |  |  |

|                      |                                                                                                                                                                                                                                     |  |         |    |  |  |  |  |  |  |  |  |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------|----|--|--|--|--|--|--|--|--|
| 5                    | Furnish Transposition Assembly Type IT(4) for tower type 'TGM' including 25x1 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. NTDC/DESIGN/01E152                          |  | Set     | 8  |  |  |  |  |  |  |  |  |
| 6                    | Furnish Double String Dead End Assemblies "DSD1(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010  |  | Set     | 3  |  |  |  |  |  |  |  |  |
| 7                    | Furnish Double String Dead End Assemblies "DSD2(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011 |  | Set     | 3  |  |  |  |  |  |  |  |  |
| 8                    | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assembles (items C1 - C7) with Coulomb or ElecNET software.                                                                |  | Lumpsum | 1  |  |  |  |  |  |  |  |  |
| <b>Sub-Total C :</b> |                                                                                                                                                                                                                                     |  |         |    |  |  |  |  |  |  |  |  |
| <b>D</b>             | <b><u>Hardware for OPGW &amp; Shieldwire</u></b>                                                                                                                                                                                    |  |         |    |  |  |  |  |  |  |  |  |
| 1                    | Furnish Suspension Assembly for OPGW including AGS clamp for single circuit tower type 'SGM' & 'TGM' as per specification                                                                                                           |  | Set     | 80 |  |  |  |  |  |  |  |  |
| 2                    | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification                                                                                                                                            |  | Set     | 8  |  |  |  |  |  |  |  |  |
| 3                    | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification                                                                                                                               |  | Set     | 29 |  |  |  |  |  |  |  |  |
| 4                    | Overhead shield wire suspension assembly for tower type 'SGM' & 'TGM' as per specification drawing                                                                                                                                  |  | Set     | 80 |  |  |  |  |  |  |  |  |



|          |                                                                                                                                                                          |  |       |       |  |  |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------|-------|--|--|--|--|--|--|--|--|
| 5        | Overhead shieldwire dead end assembly for tower type 'AGM' & 'DGM' as per specification drawing                                                                          |  | Set   | 58    |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total D :</b>                                                                                                                                                     |  |       |       |  |  |  |  |  |  |  |  |
| <b>E</b> | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |  |       |       |  |  |  |  |  |  |  |  |
| 1        | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 |  | No.   | 134   |  |  |  |  |  |  |  |  |
| 2        | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      |  | No.   | 67    |  |  |  |  |  |  |  |  |
| 3        | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. |  | No.   | 792   |  |  |  |  |  |  |  |  |
| 4        | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                |  | No.   | 2,345 |  |  |  |  |  |  |  |  |
| 5        | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor (See Note-3)                                                                                  |  | No.   | 586   |  |  |  |  |  |  |  |  |
| 6        | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         |  | No.   | 288   |  |  |  |  |  |  |  |  |
| 7        | Furnish stock bridge vibration dampers for Shield Wire.                                                                                                                  |  | No.   | 288   |  |  |  |  |  |  |  |  |
| 8        | Compression splice for 9.15mm dia EHS Shield Wire                                                                                                                        |  | No.   | 11    |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total E :</b>                                                                                                                                                     |  |       |       |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                          |  |       |       |  |  |  |  |  |  |  |  |
| <b>F</b> | <b><u>Grounding Material</u></b>                                                                                                                                         |  |       |       |  |  |  |  |  |  |  |  |
| 1        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            |  | No.   | 218   |  |  |  |  |  |  |  |  |
| 2        | Furnish flat to cable connector.                                                                                                                                         |  | No.   | 218   |  |  |  |  |  |  |  |  |
| 3        | Furnish cable to rod connector.                                                                                                                                          |  | No.   | 218   |  |  |  |  |  |  |  |  |
| 4        | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             |  | Meter | 654   |  |  |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                                                                  |                                |  |  |     |    |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--|--|-----|----|--|--|--|--|--|--|
|          | <b>Sub-Total F :</b>                                                                                                                                                                                                                                                                             |                                |  |  |     |    |  |  |  |  |  |  |
| <b>G</b> | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                                                                                                                                              |                                |  |  |     |    |  |  |  |  |  |  |
| <b>1</b> | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                       |                                |  |  |     |    |  |  |  |  |  |  |
|          | Furnish 500kV Single circuit towers SGM, AGM ,DGM & TGM including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                                |  |  |     |    |  |  |  |  |  |  |
|          | (a)                                                                                                                                                                                                                                                                                              | <b><u>Tower Type "SGM"</u></b> |  |  |     |    |  |  |  |  |  |  |
|          | (i)                                                                                                                                                                                                                                                                                              | Basic Tower Body               |  |  | No. | 8  |  |  |  |  |  |  |
|          | (ii)                                                                                                                                                                                                                                                                                             | 1.5 m Single Leg Extension     |  |  | No. | 4  |  |  |  |  |  |  |
|          | (iii)                                                                                                                                                                                                                                                                                            | 3.0 m Single Leg Extension     |  |  | No. | 12 |  |  |  |  |  |  |
|          | (iv)                                                                                                                                                                                                                                                                                             | 4.5 m Single Leg Extension     |  |  | No. | 12 |  |  |  |  |  |  |
|          | (v)                                                                                                                                                                                                                                                                                              | 6.0 m Single Leg Extension     |  |  | No. | 12 |  |  |  |  |  |  |
|          | (vi)                                                                                                                                                                                                                                                                                             | 4.5 m Body Extension           |  |  | No. | 2  |  |  |  |  |  |  |
|          | (vii)                                                                                                                                                                                                                                                                                            | 9.0 m Body Extension           |  |  | No. | 2  |  |  |  |  |  |  |
|          | (viii)                                                                                                                                                                                                                                                                                           | Stubs                          |  |  | No. | 32 |  |  |  |  |  |  |
|          | (b)                                                                                                                                                                                                                                                                                              | <b><u>Tower Type "AGM"</u></b> |  |  |     |    |  |  |  |  |  |  |
|          | (i)                                                                                                                                                                                                                                                                                              | Basic Tower Body               |  |  | No. | 3  |  |  |  |  |  |  |
|          | (ii)                                                                                                                                                                                                                                                                                             | 1.5 m Single Leg Extension     |  |  | No. | 4  |  |  |  |  |  |  |
|          | (iii)                                                                                                                                                                                                                                                                                            | 3.0 m Single Leg Extension     |  |  | No. | 4  |  |  |  |  |  |  |
|          | (iv)                                                                                                                                                                                                                                                                                             | 4.5 m Single Leg Extension     |  |  | No. | 8  |  |  |  |  |  |  |

|   |                                                              |                              |     |       |  |  |  |  |  |  |  |  |  |
|---|--------------------------------------------------------------|------------------------------|-----|-------|--|--|--|--|--|--|--|--|--|
|   | (v)                                                          | 6.0 m Single Leg Extension   | No. | 8     |  |  |  |  |  |  |  |  |  |
|   | (vi)                                                         | 4.5 m Body Extension         | No. | 2     |  |  |  |  |  |  |  |  |  |
|   | (vii)                                                        | 9.0 m Body Extension         | No. | 2     |  |  |  |  |  |  |  |  |  |
|   | (viii)                                                       | Stubs                        | No. | 12    |  |  |  |  |  |  |  |  |  |
|   | (c)                                                          | <u>Tower Type "DGM"</u>      |     |       |  |  |  |  |  |  |  |  |  |
|   | (i)                                                          | Basic Tower Body             | No. | 3     |  |  |  |  |  |  |  |  |  |
|   | (ii)                                                         | 1.5 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|   | (iii)                                                        | 3.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|   | (iv)                                                         | 4.5 m Single Leg Extension   | No. | 8     |  |  |  |  |  |  |  |  |  |
|   | (v)                                                          | 6.0 m Single Leg Extension   | No. | 8     |  |  |  |  |  |  |  |  |  |
|   | (vi)                                                         | 4.5 m Body Extension         | No. | 2     |  |  |  |  |  |  |  |  |  |
|   | (vii)                                                        | 9.0 m Body Extension         | No. | 2     |  |  |  |  |  |  |  |  |  |
|   | (viii)                                                       | Stubs                        | No. | 12    |  |  |  |  |  |  |  |  |  |
|   | (d)                                                          | <u>Tower Type "TGM"</u>      |     |       |  |  |  |  |  |  |  |  |  |
|   | (i)                                                          | Basic Tower Body             | No. | -     |  |  |  |  |  |  |  |  |  |
|   | (ii)                                                         | 6.0 m Single Leg Extension   | No. | -     |  |  |  |  |  |  |  |  |  |
|   | (iii)                                                        | Stubs                        | No. | -     |  |  |  |  |  |  |  |  |  |
|   | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                              |     |       |  |  |  |  |  |  |  |  |  |
| 2 | Furnish 795 KCM ACSR "Drake" Conductor                       |                              | km  | 38.40 |  |  |  |  |  |  |  |  |  |
| 3 | Furnish                                                      |                              |     |       |  |  |  |  |  |  |  |  |  |
|   | (a)                                                          | OPGW with at least 24 fibers | km  | 5     |  |  |  |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                     |                                                    |                                                          |  |     |      |  |  |  |  |  |  |  |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------|--|-----|------|--|--|--|--|--|--|--|
|   | (b)                                                                                                                                                                                                                                                 | Joint boxes for OPGW                               |                                                          |  |     |      |  |  |  |  |  |  |  |
|   |                                                                                                                                                                                                                                                     | (i)                                                | OPGW-OPGW (A Type)                                       |  | No. | 1    |  |  |  |  |  |  |  |
|   |                                                                                                                                                                                                                                                     | (ii)                                               | OPGW-OPGW Cable ( B Type)                                |  | No. | -    |  |  |  |  |  |  |  |
|   |                                                                                                                                                                                                                                                     | (iii)                                              | OPGW-attaching Clamps                                    |  | No. | 48   |  |  |  |  |  |  |  |
|   |                                                                                                                                                                                                                                                     | (iv)                                               | Fibre Optic Approach Cable                               |  | km  | -    |  |  |  |  |  |  |  |
|   | (c)                                                                                                                                                                                                                                                 | Test Equipment, Installation and Maintenance Tools |                                                          |  |     | -    |  |  |  |  |  |  |  |
|   |                                                                                                                                                                                                                                                     | -                                                  | Fiber Optic Talk Set (Set comprised two units)           |  | Set | -    |  |  |  |  |  |  |  |
|   |                                                                                                                                                                                                                                                     | -                                                  | Fiber Optic Tool Kit                                     |  | Set | -    |  |  |  |  |  |  |  |
|   |                                                                                                                                                                                                                                                     | -                                                  | OTDR with range ≥ 400km<br>Yokogawa AQ7260 or equivalent |  | Set | -    |  |  |  |  |  |  |  |
| 4 | Furnish 9.15 mm dia EHS Shieldwire                                                                                                                                                                                                                  |                                                    |                                                          |  | km  | 6.40 |  |  |  |  |  |  |  |
|   | <b><u>Insulator Hardware Assemblies<br/>(Complete Hardware Strings for Quad<br/>Bundle ACSR Drake Conductor)</u></b>                                                                                                                                |                                                    |                                                          |  |     |      |  |  |  |  |  |  |  |
| 5 | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'SGM' as per specification drawing No. NTDC/DESIGN/01E151        |                                                    |                                                          |  | Set | 24   |  |  |  |  |  |  |  |
| 6 | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. NTDC/DESIGN/01E153 |                                                    |                                                          |  | Set | 6    |  |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                                          |  |     |    |  |  |  |  |  |  |  |  |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|----|--|--|--|--|--|--|--|--|
| 7  | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004 |  | Set | 12 |  |  |  |  |  |  |  |  |
| 8  | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower types 'AGM' & 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005            |  | Set | 36 |  |  |  |  |  |  |  |  |
| 9  | Furnish Transposition Assembly Type IT(4) for tower type 'TGM' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. NTDC/DESIGN/01E152                                               |  | Set | -  |  |  |  |  |  |  |  |  |
| 10 | Furnish Double String Dead End Assemblies "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                       |  | Set | 3  |  |  |  |  |  |  |  |  |
| 11 | Furnish Double String Dead End Assemblies "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                      |  | Set | 3  |  |  |  |  |  |  |  |  |
|    | <b><u>Hardware for OPGW &amp; Shieldwire</u></b>                                                                                                                                                                                                         |  |     |    |  |  |  |  |  |  |  |  |
| 12 | Furnish Suspension Assembly for OPGW including AGS clamp for single circuit tower type 'SGM' & 'TGM' as per specification                                                                                                                                |  | Set | 8  |  |  |  |  |  |  |  |  |
| 13 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification                                                                                                                                                                 |  | Set | 1  |  |  |  |  |  |  |  |  |

|    |                                                                                                                                                                          |  |     |     |  |  |  |  |  |  |  |  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|-----|--|--|--|--|--|--|--|--|
| 14 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification                                                                    |  | Set | 6   |  |  |  |  |  |  |  |  |
| 15 | Overhead shield wire suspension assembly for tower type 'SGM' & 'TGM' as per specification drawing                                                                       |  | Set | 8   |  |  |  |  |  |  |  |  |
| 16 | Overhead shieldwire dead end assembly for tower type 'AGM' & 'DGM' as per specification drawing                                                                          |  | Set | 12  |  |  |  |  |  |  |  |  |
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |  |     |     |  |  |  |  |  |  |  |  |
| 17 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 |  | No. | 13  |  |  |  |  |  |  |  |  |
| 18 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      |  | No. | 7   |  |  |  |  |  |  |  |  |
| 19 | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. |  | No. | 185 |  |  |  |  |  |  |  |  |
| 20 | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                |  | No. | 331 |  |  |  |  |  |  |  |  |
| 21 | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor                                                                                               |  | No. | 83  |  |  |  |  |  |  |  |  |
| 22 | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         |  | No. | 42  |  |  |  |  |  |  |  |  |
| 23 | Furnish stock bridge vibration dampers for Shield Wire.                                                                                                                  |  | No. | 42  |  |  |  |  |  |  |  |  |
| 24 | Compression splice for 9.15 mm dia EHS Shield Wire                                                                                                                       |  | No. | 2   |  |  |  |  |  |  |  |  |
|    | <b><u>Grounding Material</u></b>                                                                                                                                         |  |     |     |  |  |  |  |  |  |  |  |
| 25 | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            |  | No. | 28  |  |  |  |  |  |  |  |  |
| 26 | Furnish flat to cable connector.                                                                                                                                         |  | No. | 28  |  |  |  |  |  |  |  |  |
| 27 | Furnish cable to rod connector.                                                                                                                                          |  | No. | 28  |  |  |  |  |  |  |  |  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                              |       |    |  |  |  |  |  |  |  |   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|----|--|--|--|--|--|--|--|---|
| 28                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Furnish 7 No. 10 copper covered ground wire. | Meter | 84 |  |  |  |  |  |  |  |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Sub-Total of G :</b>                      |       |    |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Total of Item A                              |       |    |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Total of Item B                              |       |    |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Total of Item C                              |       |    |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Total of Item D                              |       |    |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Total of Item E                              |       |    |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Total of Item F                              |       |    |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Total of Item G                              |       |    |  |  |  |  |  |  |  | - |
| <b>Grand Total of column No. 11 &amp; 12 to be carried forward to Grand summary</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                              |       |    |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                              |       |    |  |  |  |  |  |  |  |   |
| <p>* The Bidder shall specify the type of insulator being offered.</p> <p><b>Notes:</b></p> <p>1 Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types SGM, AGM, DGM, and TGM, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly.</p> <p>2 The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.</p> <p>3 The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.</p> <p>4 The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.</p> <p>5 The bidder shall be responsible to furnish the tower material, Shield Wire, OPGW, conductor, insulators, accessories, dampers &amp; hardware for conductor and OPGW, for completion of line in all respect. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.</p> |                                              |       |    |  |  |  |  |  |  |  |   |

- 6 The contractor shall transport, unload and stack leftover/additional material from site to NTDC designated Warehouse/Store at its own cost.
- 7 Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.
- 8 The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully before filling up the schedule of prices.
- 9 Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.
- 10 Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.
- 11 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.

**Signature of  
Bidder**



| Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme |                                                                                                                                                                                                                                                                                                  |                  |                            |      |          |                |           |                 |                             |                |                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------|------|----------|----------------|-----------|-----------------|-----------------------------|----------------|--------------------------------------|
| Lot-VIII: 500 kV S/C C5-Ludewala —Section B (Approx. 32 km)                                                                                          |                                                                                                                                                                                                                                                                                                  |                  |                            |      |          |                |           |                 |                             |                |                                      |
| SCHEDULE NO.2- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM ABROAD                                                                                  |                                                                                                                                                                                                                                                                                                  |                  |                            |      |          |                |           |                 |                             |                |                                      |
| Item No.                                                                                                                                             | Description                                                                                                                                                                                                                                                                                      |                  |                            | Unit | Quantity | Unit Price     |           | Total EXW Price | Total Inland Transportation | Total Price    | Sales and other Taxes & Duties (PKR) |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  |                  |                            |      |          | Local Currency | EXW Price |                 |                             | Local Currency |                                      |
| 1                                                                                                                                                    | 2                                                                                                                                                                                                                                                                                                |                  |                            | 3    | 4        | 5              | 6         | 7 = 4 x 6       | 8                           | 9 = 7+ 8       | 10                                   |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  |                  |                            |      |          |                |           |                 |                             |                |                                      |
|                                                                                                                                                      | 500kV Single Circuit Transmission Line                                                                                                                                                                                                                                                           |                  |                            |      |          |                |           |                 |                             |                |                                      |
| A                                                                                                                                                    | Steel Towers                                                                                                                                                                                                                                                                                     |                  |                            |      |          |                |           |                 |                             |                |                                      |
| 1                                                                                                                                                    | Furnish 500kV Single circuit towers SGM, AGM ,DGM & TGM including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                  |                            |      |          |                |           |                 |                             |                |                                      |
|                                                                                                                                                      | (a)                                                                                                                                                                                                                                                                                              | Tower Type "SGM" |                            |      |          |                |           |                 |                             |                |                                      |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (i)              | Basic Tower Body           | No.  | 76       |                |           |                 |                             |                |                                      |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (ii)             | 1.5 m Single Leg Extension | No.  | -        |                |           |                 |                             |                |                                      |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (iii)            | 3.0 m Single Leg Extension | No.  | 60       |                |           |                 |                             |                |                                      |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (iv)             | 4.5 m Single Leg Extension | No.  | 120      |                |           |                 |                             |                |                                      |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (v)              | 6.0 m Single Leg Extension | No.  | 124      |                |           |                 |                             |                |                                      |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (vi)             | 4.5 m Body Extension       |      | 10       |                |           |                 |                             |                |                                      |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (vii)            | 9.0 m Body Extension       | No.  | 10       |                |           |                 |                             |                |                                      |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (viii)           | Stubs                      | No.  | 304      |                |           |                 |                             |                |                                      |

|          |                                                              |                         |                            |     |        |  |  |  |  |  |
|----------|--------------------------------------------------------------|-------------------------|----------------------------|-----|--------|--|--|--|--|--|
|          | (b)                                                          | <u>Tower Type "AGM"</u> |                            |     |        |  |  |  |  |  |
|          |                                                              | (i)                     | Basic Tower Body           | No. | 14     |  |  |  |  |  |
|          |                                                              | (ii)                    | 1.5 m Single Leg Extension | No. | -      |  |  |  |  |  |
|          |                                                              | (iii)                   | 3.0 m Single Leg Extension | No. | 12     |  |  |  |  |  |
|          |                                                              | (iv)                    | 4.5 m Single Leg Extension | No. | 20     |  |  |  |  |  |
|          |                                                              | (v)                     | 6.0 m Single Leg Extension | No. | 24     |  |  |  |  |  |
|          |                                                              | (vi)                    | 4.5 m Body Extension       |     | 3      |  |  |  |  |  |
|          |                                                              | (vii)                   | 9.0 m Body Extension       | No. | 3      |  |  |  |  |  |
|          |                                                              | (viii)                  | Stubs                      | No. | 56     |  |  |  |  |  |
|          | (c)                                                          | <u>Tower Type "DGM"</u> |                            |     |        |  |  |  |  |  |
|          |                                                              | (i)                     | Basic Tower Body           | No. | 15     |  |  |  |  |  |
|          |                                                              | (ii)                    | 1.5 m Single Leg Extension | No. | -      |  |  |  |  |  |
|          |                                                              | (iii)                   | 3.0 m Single Leg Extension | No. | 12     |  |  |  |  |  |
|          |                                                              | (iv)                    | 4.5 m Single Leg Extension | No. | 24     |  |  |  |  |  |
|          |                                                              | (v)                     | 6.0 m Single Leg Extension | No. | 24     |  |  |  |  |  |
|          |                                                              | (vi)                    | 4.5 m Body Extension       |     | 3      |  |  |  |  |  |
|          |                                                              | (vii)                   | 9.0 m Body Extension       | No. | 3      |  |  |  |  |  |
|          |                                                              | (viii)                  | Stubs                      | No. | 60     |  |  |  |  |  |
|          | (d)                                                          | <u>Tower Type "TGM"</u> |                            |     |        |  |  |  |  |  |
|          |                                                              | (i)                     | Basic Tower Body           | No. | 4      |  |  |  |  |  |
|          |                                                              | (ii)                    | 4.0 m Single Leg Extension | No. | 8      |  |  |  |  |  |
|          |                                                              | (iii)                   | 6.0 m Single Leg Extension | No. | 8      |  |  |  |  |  |
|          |                                                              | (iv)                    | Stubs                      | No. | 16     |  |  |  |  |  |
|          | <b>Sub-Total A :</b>                                         |                         |                            |     |        |  |  |  |  |  |
| <b>B</b> | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                         |                            |     |        |  |  |  |  |  |
| 1        | Furnish 795 KCM ACSR "Drake" Conductor                       |                         |                            | km  | 390.40 |  |  |  |  |  |
| 2        | Furnish                                                      |                         |                            |     |        |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                    |                                                                |     |       |  |  |  |  |  |  |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-----|-------|--|--|--|--|--|--|
|          | (a)                                                                                                                                                                                                                                                | OPGW with at least 24 fibers                                   | km  | 40    |  |  |  |  |  |  |
|          | (b)                                                                                                                                                                                                                                                | Joint boxes for OPGW                                           |     |       |  |  |  |  |  |  |
|          | (i)                                                                                                                                                                                                                                                | OPGW-OPGW (A Type)                                             | No. | 8     |  |  |  |  |  |  |
|          | (ii)                                                                                                                                                                                                                                               | OPGW-OPGW Cable ( B Type)                                      | No. | -     |  |  |  |  |  |  |
|          | (iii)                                                                                                                                                                                                                                              | OPGW-attaching Clamps                                          | No. | 480   |  |  |  |  |  |  |
|          | (iv)                                                                                                                                                                                                                                               | Fibre Optic Approach Cable                                     | km  | -     |  |  |  |  |  |  |
|          | (c)                                                                                                                                                                                                                                                | Test Equipment, Installation and Maintenance Tools             |     | -     |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                  | Fiber Optic Talk Set (Set comprised two units)                 | Set | 1     |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                  | Fiber Optic Tool Kit                                           | Set | 1     |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                  | OTDR with range $\geq 400$ km<br>Yokogawa AQ7260 or equivalent | Set | 1     |  |  |  |  |  |  |
| 3        |                                                                                                                                                                                                                                                    | Furnish 9.15 mm dia EHS Shieldwire                             | km  | 35.20 |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                    |                                                                |     |       |  |  |  |  |  |  |
|          | <b>Sub Total B :</b>                                                                                                                                                                                                                               |                                                                |     |       |  |  |  |  |  |  |
| <b>C</b> | <b><u>Insulator Hardware Assemblies</u></b><br><b><u>(Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                      |                                                                |     |       |  |  |  |  |  |  |
| 1        | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'SGM' & TGM as per specification drawing No. NTDC/DESIGN/01E151 |                                                                | Set | 240   |  |  |  |  |  |  |

|   |                                                                                                                                                                                                                                                          |     |     |  |  |  |  |  |  |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|--|--|--|--|--|--|
| 2 | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. NTDC/DESIGN/01E153      | Set | 29  |  |  |  |  |  |  |
| 3 | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004 | Set | 58  |  |  |  |  |  |  |
| 4 | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower types 'AGM' & 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005            | Set | 174 |  |  |  |  |  |  |
| 5 | Furnish Transposition Assembly Type IT(4) for tower type 'TGM' including 25x1 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. NTDC/DESIGN/01E152                                               | Set | 8   |  |  |  |  |  |  |
| 6 | Furnish Double String Dead End Assemblies "DSD1(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                       | Set | 3   |  |  |  |  |  |  |
| 7 | Furnish Double String Dead End Assemblies "DSD2(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                      | Set | 3   |  |  |  |  |  |  |

|          |                                                                                                                                                                          |         |       |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------|--|--|--|--|--|--|
| 8        | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assemblies (items C1 - C7) with Coulomb or ElecNET software.    | Lumpsum | 1     |  |  |  |  |  |  |
|          | <b>Sub-Total C :</b>                                                                                                                                                     |         |       |  |  |  |  |  |  |
| <b>D</b> | <b><u>Hardware for OPGW &amp; Shieldwire</u></b>                                                                                                                         |         |       |  |  |  |  |  |  |
| 1        | Furnish Suspension Assembly for OPGW including AGS clamp for single circuit tower type 'SGM' & 'TGM' as per specification                                                | Set     | 80    |  |  |  |  |  |  |
| 2        | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification                                                                                 | Set     | 8     |  |  |  |  |  |  |
| 3        | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification                                                                    | Set     | 29    |  |  |  |  |  |  |
| 4        | Overhead shield wire suspension assembly for tower type 'SGM' & 'TGM' as per specification drawing                                                                       | Set     | 80    |  |  |  |  |  |  |
| 5        | Overhead shieldwire dead end assembly for tower type 'AGM' & 'DGM' as per specification drawing                                                                          | Set     | 58    |  |  |  |  |  |  |
|          | <b>Sub-Total D :</b>                                                                                                                                                     |         |       |  |  |  |  |  |  |
| <b>E</b> | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |         |       |  |  |  |  |  |  |
| 1        | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 | No.     | 134   |  |  |  |  |  |  |
| 2        | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      | No.     | 67    |  |  |  |  |  |  |
| 3        | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No.     | 792   |  |  |  |  |  |  |
| 4        | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No.     | 2,345 |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                                                                  |       |     |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|--|--|--|--|--|--|
| 5        | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor (See Note-3)                                                                                                                                                                                                          | No.   | 586 |  |  |  |  |  |  |
| 6        | Furnish stock bridge vibration dampers for OPGW.                                                                                                                                                                                                                                                 | No.   | 288 |  |  |  |  |  |  |
| 7        | Furnish stock bridge vibration dampers for Shield Wire.                                                                                                                                                                                                                                          | No.   | 288 |  |  |  |  |  |  |
| 8        | Compression splice for 9.15mm dia EHS Shield Wire                                                                                                                                                                                                                                                | No.   | 11  |  |  |  |  |  |  |
|          | <b>Sub-Total E :</b>                                                                                                                                                                                                                                                                             |       |     |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  |       |     |  |  |  |  |  |  |
| <b>F</b> | <b><u>Grounding Material</u></b>                                                                                                                                                                                                                                                                 |       |     |  |  |  |  |  |  |
| 1        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                                                                                                                                                    | No.   | 218 |  |  |  |  |  |  |
| 2        | Furnish flat to cable connector.                                                                                                                                                                                                                                                                 | No.   | 218 |  |  |  |  |  |  |
| 3        | Furnish cable to rod connector.                                                                                                                                                                                                                                                                  | No.   | 218 |  |  |  |  |  |  |
| 4        | Furnish 7 No. 10 copper covered ground wire.                                                                                                                                                                                                                                                     | Meter | 654 |  |  |  |  |  |  |
|          | <b>Sub-Total F :</b>                                                                                                                                                                                                                                                                             |       |     |  |  |  |  |  |  |
| <b>G</b> | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                                                                                                                                              |       |     |  |  |  |  |  |  |
| <b>1</b> | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                       |       |     |  |  |  |  |  |  |
|          | Furnish 500kV Single circuit towers SGM, AGM ,DGM & TGM including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |       |     |  |  |  |  |  |  |
|          | (a) <u>Tower Type "SGM"</u>                                                                                                                                                                                                                                                                      |       |     |  |  |  |  |  |  |
|          | (i) Basic Tower Body                                                                                                                                                                                                                                                                             | No.   | 8   |  |  |  |  |  |  |
|          | (ii) 1.5 m Single Leg Extension                                                                                                                                                                                                                                                                  | No.   | 4   |  |  |  |  |  |  |
|          | (iii) 3.0 m Single Leg Extension                                                                                                                                                                                                                                                                 | No.   | 12  |  |  |  |  |  |  |
|          | (iv) 4.5 m Single Leg Extension                                                                                                                                                                                                                                                                  | No.   | 12  |  |  |  |  |  |  |
|          | (v) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                   | No.   | 12  |  |  |  |  |  |  |

|     |                                                              |                            |     |       |  |  |  |  |  |  |
|-----|--------------------------------------------------------------|----------------------------|-----|-------|--|--|--|--|--|--|
|     | (vi)                                                         | 4.5 m Body Extension       | No. | 2     |  |  |  |  |  |  |
|     | (vii)                                                        | 9.0 m Body Extension       | No. | 2     |  |  |  |  |  |  |
|     | (viii)                                                       | Stubs                      | No. | 32    |  |  |  |  |  |  |
| (b) | <u>Tower Type "AGM"</u>                                      |                            |     |       |  |  |  |  |  |  |
|     | (i)                                                          | Basic Tower Body           | No. | 3     |  |  |  |  |  |  |
|     | (ii)                                                         | 1.5 m Single Leg Extension | No. | 4     |  |  |  |  |  |  |
|     | (iii)                                                        | 3.0 m Single Leg Extension | No. | 4     |  |  |  |  |  |  |
|     | (iv)                                                         | 4.5 m Single Leg Extension | No. | 8     |  |  |  |  |  |  |
|     | (v)                                                          | 6.0 m Single Leg Extension | No. | 8     |  |  |  |  |  |  |
|     | (vi)                                                         | 4.5 m Body Extension       | No. | 2     |  |  |  |  |  |  |
|     | (vii)                                                        | 9.0 m Body Extension       | No. | 2     |  |  |  |  |  |  |
|     | (viii)                                                       | Stubs                      | No. | 12    |  |  |  |  |  |  |
| (c) | <u>Tower Type "DGM"</u>                                      |                            |     |       |  |  |  |  |  |  |
|     | (i)                                                          | Basic Tower Body           | No. | 3     |  |  |  |  |  |  |
|     | (ii)                                                         | 1.5 m Single Leg Extension | No. | 4     |  |  |  |  |  |  |
|     | (iii)                                                        | 3.0 m Single Leg Extension | No. | 4     |  |  |  |  |  |  |
|     | (iv)                                                         | 4.5 m Single Leg Extension | No. | 8     |  |  |  |  |  |  |
|     | (v)                                                          | 6.0 m Single Leg Extension | No. | 8     |  |  |  |  |  |  |
|     | (vi)                                                         | 4.5 m Body Extension       | No. | 2     |  |  |  |  |  |  |
|     | (vii)                                                        | 9.0 m Body Extension       | No. | 2     |  |  |  |  |  |  |
|     | (viii)                                                       | Stubs                      | No. | 12    |  |  |  |  |  |  |
| (d) | <u>Tower Type "TGM"</u>                                      |                            |     |       |  |  |  |  |  |  |
|     | (i)                                                          | Basic Tower Body           | No. | -     |  |  |  |  |  |  |
|     | (ii)                                                         | 6.0 m Single Leg Extension | No. | -     |  |  |  |  |  |  |
|     | (iii)                                                        | Stubs                      | No. | -     |  |  |  |  |  |  |
|     | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                            |     |       |  |  |  |  |  |  |
| 2   | Furnish 795 KCM ACSR "Drake" Conductor                       |                            | km  | 38.40 |  |  |  |  |  |  |
| 3   | Furnish                                                      |                            |     |       |  |  |  |  |  |  |

|   |       |                                                                                                                                                                                                                                                     |     |      |  |  |  |  |  |  |
|---|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|--|--|--|--|--|--|
|   | (a)   | OPGW with at least 24 fibers                                                                                                                                                                                                                        | km  | 5    |  |  |  |  |  |  |
|   | (b)   | Joint boxes for OPGW                                                                                                                                                                                                                                |     |      |  |  |  |  |  |  |
|   | (i)   | OPGW-OPGW (A Type)                                                                                                                                                                                                                                  | No. | 1    |  |  |  |  |  |  |
|   | (ii)  | OPGW-OPGW Cable ( B Type)                                                                                                                                                                                                                           | No. | -    |  |  |  |  |  |  |
|   | (iii) | OPGW-attaching Clamps                                                                                                                                                                                                                               | No. | 48   |  |  |  |  |  |  |
|   | (iv)  | Fibre Optic Approach Cable                                                                                                                                                                                                                          | km  | -    |  |  |  |  |  |  |
|   | (c)   | Test Equipment, Installation and Maintenance Tools                                                                                                                                                                                                  |     | -    |  |  |  |  |  |  |
|   | -     | Fiber Optic Talk Set (Set comprised two units)                                                                                                                                                                                                      | Set | -    |  |  |  |  |  |  |
|   | -     | Fiber Optic Tool Kit                                                                                                                                                                                                                                | Set | -    |  |  |  |  |  |  |
|   | -     | OTDR with range $\geq 400$ km<br>Yokogawa AQ7260 or equivalent                                                                                                                                                                                      | Set | -    |  |  |  |  |  |  |
| 4 |       | Furnish 9.15 mm dia EHS Shieldwire                                                                                                                                                                                                                  | km  | 6.40 |  |  |  |  |  |  |
|   |       | <b><u>Insulator Hardware Assemblies<br/>(Complete Hardware Strings for Quad<br/>Bundle ACSR Drake Conductor)</u></b>                                                                                                                                |     |      |  |  |  |  |  |  |
| 5 |       | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'SGM' as per specification drawing No. NTDC/DESIGN/01E151        | Set | 24   |  |  |  |  |  |  |
| 6 |       | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. NTDC/DESIGN/01E153 | Set | 6    |  |  |  |  |  |  |



|    |                                                                                                                                                                                                                                                          |     |    |  |  |  |  |  |  |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|--|--|--|--|--|--|
| 7  | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004 | Set | 12 |  |  |  |  |  |  |
| 8  | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower types 'AGM' & 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005            | Set | 36 |  |  |  |  |  |  |
| 9  | Furnish Transposition Assembly Type IT(4) for tower type 'TGM' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. NTDC/DESIGN/01E152                                               | Set | -  |  |  |  |  |  |  |
| 10 | Furnish Double String Dead End Assemblies "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                       | Set | 3  |  |  |  |  |  |  |
| 11 | Furnish Double String Dead End Assemblies "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                      | Set | 3  |  |  |  |  |  |  |
|    | <b><u>Hardware for OPGW &amp; Shieldwire</u></b>                                                                                                                                                                                                         |     |    |  |  |  |  |  |  |
| 12 | Furnish Suspension Assembly for OPGW including AGS clamp for single circuit tower type 'SGM' & 'TGM' as per specification                                                                                                                                | Set | 8  |  |  |  |  |  |  |
| 13 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification                                                                                                                                                                 | Set | 1  |  |  |  |  |  |  |

|    |                                                                                                                                                                          |       |     |  |  |  |  |  |  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|--|--|--|--|--|--|
| 14 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification                                                                    | Set   | 6   |  |  |  |  |  |  |
| 15 | Overhead shield wire suspension assembly for tower type 'SGM' & 'TGM' as per specification drawing                                                                       | Set   | 8   |  |  |  |  |  |  |
| 16 | Overhead shieldwire dead end assembly for tower type 'AGM' & 'DGM' as per specification drawing                                                                          | Set   | 12  |  |  |  |  |  |  |
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |       |     |  |  |  |  |  |  |
| 17 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 | No.   | 13  |  |  |  |  |  |  |
| 18 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      | No.   | 7   |  |  |  |  |  |  |
| 19 | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No.   | 185 |  |  |  |  |  |  |
| 20 | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No.   | 331 |  |  |  |  |  |  |
| 21 | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor                                                                                               | No.   | 83  |  |  |  |  |  |  |
| 22 | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No.   | 42  |  |  |  |  |  |  |
| 23 | Furnish stock bridge vibration dampers for Shield Wire.                                                                                                                  | No.   | 42  |  |  |  |  |  |  |
| 24 | Compression splice for 9.15 mm dia EHS Shield Wire                                                                                                                       | No.   | 2   |  |  |  |  |  |  |
|    | <b><u>Grounding Material</u></b>                                                                                                                                         |       |     |  |  |  |  |  |  |
| 25 | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            | No.   | 28  |  |  |  |  |  |  |
| 26 | Furnish flat to cable connector.                                                                                                                                         | No.   | 28  |  |  |  |  |  |  |
| 27 | Furnish cable to rod connector.                                                                                                                                          | No.   | 28  |  |  |  |  |  |  |
| 28 | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             | Meter | 84  |  |  |  |  |  |  |

|                                                           |                         |  |  |  |  |  |   |
|-----------------------------------------------------------|-------------------------|--|--|--|--|--|---|
|                                                           | <b>Sub-Total of G :</b> |  |  |  |  |  | - |
|                                                           | Total of Item A         |  |  |  |  |  | - |
|                                                           | Total of Item B         |  |  |  |  |  | - |
|                                                           | Total of Item C         |  |  |  |  |  | - |
|                                                           | Total of Item D         |  |  |  |  |  | - |
|                                                           | Total of Item E         |  |  |  |  |  | - |
|                                                           | Total of Item F         |  |  |  |  |  | - |
|                                                           | Total of Item G         |  |  |  |  |  | - |
| <b>Total of Column 9 to be forwarded to Grand Summary</b> |                         |  |  |  |  |  | - |
|                                                           |                         |  |  |  |  |  |   |

- \* The Bidder shall specify the type of insulator being offered.

**Notes:**

- 1 Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types SGM, AGM, DGM, and TGM, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly.
- 2 The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.
- 3 The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.
- 4 The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.
- 5 The bidder shall be responsible to furnish the tower material, OPGW, Shield Wire, conductor, insulators, accessories, dampers & hardware for conductor and OPGW, for completion of line in all respect. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.
- 6 The contractor shall transport, unload and stack leftover/additional material from site to NTDC designated Warehouse/Store at its own cost.

- 7 Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.
- 8 The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully before filling up the schedule of prices.
- 9 Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.
- 10 Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.
- 11 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.

**Signature of Bidder**

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**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-VIII: 500 kV S/C C5-Ludewala – Section B (Approx. 32 km)**  
**Schedule No.3 - Design Services**

| Item                                                  | Description | Qty. | Unit Price <sup>1</sup><br>Local<br>Currency | Total Price | Total<br>Provincial<br>Sales Tax |
|-------------------------------------------------------|-------------|------|----------------------------------------------|-------------|----------------------------------|
| 1                                                     | 2           | 3    | 4                                            | 5 = 3 x 4   | 6                                |
| 1                                                     |             | Lot  |                                              |             |                                  |
| NOT APPLICABLE                                        |             |      |                                              |             |                                  |
| 2                                                     |             | Lot  |                                              |             |                                  |
| 3                                                     |             | Lot  |                                              |             |                                  |
| TOTAL Column 5 to be carried forward to Grand Summary |             |      |                                              |             |                                  |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>1</sup>*Specify currency in accordance ITB 12.*

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme  
Lot-VIII: 500 kV S/C C5-Ludewala —Section B (Approx. 32 km)**

**SCHEDULE NO.4 - INSTALLATION AND OTHER SERVICES**

**(INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)**

| Item No. | Description                                                                               | Unit     | Qty | Unit Price (PKR) | Total Price (PKR) Including all Custom duties, taxes and other levies etc. w/o Provincial Sales Tax | Total Provincial Sales tax (PST) in PKR |
|----------|-------------------------------------------------------------------------------------------|----------|-----|------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------|
| 1        | 2                                                                                         | 3        | 4   | 5                | 6=4*5                                                                                               | 7                                       |
|          | <b>INSTALLATION (INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)</b> |          |     |                  |                                                                                                     |                                         |
| <b>A</b> | <b><u>Survey</u></b>                                                                      |          |     |                  |                                                                                                     |                                         |
| 1        | Clearing Right of Way (ROW)                                                               | Lump Sum | 1   |                  |                                                                                                     |                                         |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |     |  |  |  |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----|--|--|--|
| 2        | Validation of already established centre line prior to foundation construction and preparation of as-built plan & profile drawings of the already prepared plan & profile drawings using PLS-CADD and construction structure lists (to be provided to the Contractor after award of contract) of the constructed transmission line after incorporating all the changes and submitted to the Project Manager. In case of route diversion, payment of the diverted portion will be made as per item A.3 | km        | 32  |  |  |  |
| 3        | Route alignment and detailed surveying of diverted portion not limited to chainage and leveling, preparation of plan & profile drawings, spotting of towers and preparation of construction structure list & Latitude & Longitude with hand held GPS of each tower location                                                                                                                                                                                                                           | km        | 3.2 |  |  |  |
|          | <b>Sub-Total A:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |     |  |  |  |
| <b>B</b> | <b><u>Sub-soil Investigations:</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |     |  |  |  |
|          | Sub-Soil Investigation for T/Line at (ii) and confirmatory sub-soil Investigation in varied soil/boulder/rock (including laboratory tests) as per Specifications (Technical Provisions for Construction Clause 10.2) and submission of Sub-Soil Investigation Report.                                                                                                                                                                                                                                 |           |     |  |  |  |
| (a)      | From NSL to depth of 15 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Lin. Mtr. | 45  |  |  |  |
| (b)      | From 15 m to depth of 25 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Lin. Mtr. | 10  |  |  |  |
| (c)      | Hand Auger upto depth of 10m                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Lin. Mtr. | 30  |  |  |  |
|          | <b>Sub-Total B:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |     |  |  |  |
| <b>C</b> | <b><u>Foundations</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |     |  |  |  |

|          |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |    |  |  |  |
|----------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----|--|--|--|
|          |                                | Reinforced Concrete Spread Foundations (4 legs) complete in all respect in varied soil as well as boulders/rock complete with supply of materials including alignment, peg marking, access, preparatory works, excavation, blasting, leveling, grading of tower site, cutting, dewatering, shuttering, reinforcement, concreting (using Sulphate Resistance Cement conforming to ASTM C-150 Type-V), lean concrete (if required), curing, backfilling of foundations after concreting with excavated/borrowed earth (irrespective of lead), application of three (03) coats hot bitumen (ExpanProof* 10 – Fospak bitumen and compaction of backfill material in layers, stub setting and site restoration etc. including tower staking (Latitude & Longitude with hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type as per drawings and specifications: |            |    |  |  |  |
|          | (a)                            | SGM (Complete Foundation 4 Legs) as per Drawing No.3206/169/TD/01G100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |    |  |  |  |
|          | (i)                            | Foundation Type Do (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 3  |  |  |  |
|          | (ii)                           | Foundation Type D1 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 10 |  |  |  |
|          | (iv)                           | Foundation Type S1(Semi-Submerged)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Foundation | 3  |  |  |  |
|          | (v)                            | Foundation Type W (Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Foundation | 0  |  |  |  |
|          | (vi)                           | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Foundation | 0  |  |  |  |
|          | (b)                            | AGM (Complete Foundation 4 Legs) as per Drawing No. 3206/169/TD/01G101                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |    |  |  |  |
|          | (i)                            | Foundation Type Do (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 1  |  |  |  |
|          | (ii)                           | Foundation Type D1 (Dry) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Foundation | 0  |  |  |  |
|          | (iii)                          | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Foundation | 0  |  |  |  |
|          | (iv)                           | Foundation Type W (Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Foundation | 0  |  |  |  |
| <b>D</b> | <b><u>Pile Foundations</u></b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |    |  |  |  |



|  |     |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |           |  |  |  |
|--|-----|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|--|--|--|
|  | D-1 |      | Reinforced concrete pile foundations (cast in situ installation) complete in all type of soil as well as boulders/gravels/rock with supply of materials including excavation, drilling/boring, shuttering, reinforcement, concreting, bitumen coating, backfilling, installation of Stubs, tower grounding, site clearing etc. using Sulphate Resistance Cement conforming to ASTM C-150 Type-V shall be used including tower staking (Latitude & Longitude with RTK/hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type: |            |           |  |  |  |
|  | (a) |      | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, SGM, and drawing No. <b>3206/169/TD/01G110</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Foundation | <b>63</b> |  |  |  |
|  | (b) |      | Reinforced concrete single pile per footing 900 mm dia. as per drawing No. <b>3206/169/TD/01G110</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |           |  |  |  |
|  |     | (i)  | Pile shaft upto depth of 8 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Lin.mtr    | 2,016     |  |  |  |
|  |     | (ii) | Pile shaft upto depth 08 - 13 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Lin.mtr    | 400       |  |  |  |
|  | (c) |      | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, AGM, and drawing No. <b>3206/169/TD/01G111</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Foundation | <b>6</b>  |  |  |  |
|  | (d) |      | Reinforced concrete single pile per footing 900 mm dia. as per drawing No. <b>3206/169/TD/01G111</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |           |  |  |  |
|  |     | (i)  | Pile shaft upto depth of 15 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Lin.mtr    | 360       |  |  |  |
|  |     | (ii) | Pile shaft depth 15 - 20 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lin.mtr    | 20        |  |  |  |
|  | (e) |      | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DGM, and drawing No. <b>3206/169/TD/01G112</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Foundation | <b>5</b>  |  |  |  |

|          |                                                                                                                                                                                                                                                            |                                                                                                                                                        |            |       |  |  |  |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------|--|--|--|
|          | (f)                                                                                                                                                                                                                                                        | Reinforced concrete single pile per footing 1200 mm dia. as per drawing No. <b>3206/169/TD/01G112</b> (including steel liner/casing), if required.     |            |       |  |  |  |
|          | (i)                                                                                                                                                                                                                                                        | Pile shaft upto depth of 15 m                                                                                                                          | Lin.mtr    | 300   |  |  |  |
|          | (ii)                                                                                                                                                                                                                                                       | Pile shaft depth 15 - 20 m                                                                                                                             | Lin.mtr    | 40    |  |  |  |
|          | D-2                                                                                                                                                                                                                                                        | Pile load test in compression confirming to ASTM D1143 / D1143M and in uplift confirming to ASTM D3689 / D3689M at 2.5 times of tower foundation loads |            |       |  |  |  |
|          | (i)                                                                                                                                                                                                                                                        | SGM (In Compression)                                                                                                                                   | Pile       | 1     |  |  |  |
|          | (ii)                                                                                                                                                                                                                                                       | SGM (In Tension/Uplift)                                                                                                                                | Pile       | 1     |  |  |  |
|          | (iii)                                                                                                                                                                                                                                                      | Reinforced concrete single Test pile per footing 900 mm dia. as per drawing No. 3206/169/TD/01G110 (including steel liner/casing), if required.        |            | 2     |  |  |  |
|          | (a)                                                                                                                                                                                                                                                        | Pile shaft upto depth of 8 m                                                                                                                           | Lin.mtr    | 16    |  |  |  |
|          | (b)                                                                                                                                                                                                                                                        | Pile shaft upto depth 08 - 13 m                                                                                                                        | Lin.mtr    | 10    |  |  |  |
|          | D-3                                                                                                                                                                                                                                                        | Sonic Integrity Test at pile foundation confirming to ASTM D5882                                                                                       | No.        | 40    |  |  |  |
|          | <b>Sub-Total D:</b>                                                                                                                                                                                                                                        |                                                                                                                                                        |            |       |  |  |  |
| <b>E</b> | <b><u>Erection of Steel Towers</u></b>                                                                                                                                                                                                                     |                                                                                                                                                        |            |       |  |  |  |
| 1        | Transport and Install 500kV single circuit towers type SGM, AGM, DGM & TGM with all accessories i.e anti climbing devices, aerial markers number plates, danger signs, phase plates, Bird Guards etc. in accordance with requirements of Bidding Documents |                                                                                                                                                        | Ton        | 1,218 |  |  |  |
| 2        | Welding of erected tower bolts & nuts after final inspection upto height of 8.0 m from top of foundation chimney as per specification drawing                                                                                                              |                                                                                                                                                        | Each tower | 109   |  |  |  |
|          | <b>Sub-Total E:</b>                                                                                                                                                                                                                                        |                                                                                                                                                        |            |       |  |  |  |

|          |                                                                                                                                                                                                                                                                                               |                    |      |   |  |   |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------|---|--|---|
| <b>F</b> | <b><u>Stringing of Conductor and OPGW</u></b>                                                                                                                                                                                                                                                 |                    |      |   |  |   |
| 1        | Transport & Install 795KCM ACSR Drake for quad conductor configuration insulator hanging, hardware assemblies, accessories & dampers etc. complete in all respects as per specifications & approved drawings and methodology.                                                                 | km D/C Quad Bundle | 32   |   |  |   |
| 2        | Transport & Install OPGW & Shield Wire including installation of drop down lengths for joint boxes at the towers along with allied hardware material including hardware assemblies, joint boxes accessories, dampers etc. complete in all respects as per specifications & approved drawings. | km (on Both Peaks) | 32   |   |  |   |
|          | <b>Sub-Total F:</b>                                                                                                                                                                                                                                                                           |                    |      |   |  |   |
| <b>G</b> | <b><u>Testing &amp; Commissioning</u></b>                                                                                                                                                                                                                                                     |                    |      |   |  |   |
| 1        | Testing and commissioning of the line                                                                                                                                                                                                                                                         | Lumpsum            | 1    |   |  |   |
|          | <b>Sub-Total G:</b>                                                                                                                                                                                                                                                                           |                    |      |   |  |   |
| <b>H</b> | <b><u>ENVIRONMENTAL AND SOCIAL SAFEGUARDS</u></b>                                                                                                                                                                                                                                             |                    |      |   |  |   |
| 1        | Tree Plantation (Minimum height 4 feet)                                                                                                                                                                                                                                                       | No.                | 3000 |   |  |   |
| 2        | Water quality monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route.                                                                                                                                                          | No.                | 28   |   |  |   |
| 3        | Ambient Air monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route.                                                                                                                                                            | No.                | 28   |   |  |   |
| 4        | Noise monitoring / analysis / measurement on quarterly basis for the whole project period at three locations along the TL route.                                                                                                                                                              | No.                | 28   |   |  |   |
|          | <b>Sub-Total H:</b>                                                                                                                                                                                                                                                                           |                    |      | - |  | - |
|          |                                                                                                                                                                                                                                                                                               |                    |      |   |  |   |
| <b>I</b> | <b><u>INSTALLATION SERVICES FOR ADDITIONAL WORK</u></b>                                                                                                                                                                                                                                       |                    |      |   |  |   |

|                                                                                                                                                                                                                                                               |                                                                             |        |      |  |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|--------|------|--|--|--|
| 1                                                                                                                                                                                                                                                             | Grading/Cutting/Excavation (Dry Soil)                                       | Cu. m. | 50   |  |  |  |
| 2                                                                                                                                                                                                                                                             | Excavation (semi-submerged soil)                                            | Cu. m. | 35   |  |  |  |
| 3                                                                                                                                                                                                                                                             | Excavation (submerged soil)                                                 | Cu. m. | 40   |  |  |  |
| 4                                                                                                                                                                                                                                                             | Blasting/Cutting/Excavation/Grading (boulder/Rock)                          | Cu. m. | 50   |  |  |  |
| 5                                                                                                                                                                                                                                                             | Concrete (3000 psi at 28 days) furnished and installed                      | Cu. m. | 100  |  |  |  |
| 6                                                                                                                                                                                                                                                             | Concrete (4000 psi at 28 days) furnished and installed                      | Cu. m. | 25   |  |  |  |
| 7                                                                                                                                                                                                                                                             | Reinforcing Bars furnished and installed (Grade-60)                         | kg     | 1000 |  |  |  |
| 8                                                                                                                                                                                                                                                             | Overhaul from Borrow and Compaction (regardless of the distance for borrow) | Cu. m. | 100  |  |  |  |
| 9                                                                                                                                                                                                                                                             | Lean concrete furnished and installed (2000 psi strength at 28 days)        | Cu. m. | 70   |  |  |  |
| 10                                                                                                                                                                                                                                                            | Compacted crush+sand (50:50 ratio) installed under footings                 | Cu. m. | 50   |  |  |  |
| 11                                                                                                                                                                                                                                                            | Bitumen coating for footing                                                 | Sq. m  | 50   |  |  |  |
| 12                                                                                                                                                                                                                                                            | Compacted Backfill                                                          | Cu. m. | 100  |  |  |  |
|                                                                                                                                                                                                                                                               | <b>Sub-Total I:</b>                                                         |        |      |  |  |  |
|                                                                                                                                                                                                                                                               | <b>Total of Item A</b>                                                      |        |      |  |  |  |
|                                                                                                                                                                                                                                                               | <b>Total of Item B</b>                                                      |        |      |  |  |  |
|                                                                                                                                                                                                                                                               | <b>Total of Item C</b>                                                      |        |      |  |  |  |
|                                                                                                                                                                                                                                                               | <b>Total of Item D</b>                                                      |        |      |  |  |  |
|                                                                                                                                                                                                                                                               | <b>Total of Item E</b>                                                      |        |      |  |  |  |
|                                                                                                                                                                                                                                                               | <b>Total of Item F</b>                                                      |        |      |  |  |  |
|                                                                                                                                                                                                                                                               | <b>Total of Item G</b>                                                      |        |      |  |  |  |
|                                                                                                                                                                                                                                                               | <b>Total of Item H</b>                                                      |        |      |  |  |  |
|                                                                                                                                                                                                                                                               | <b>Total of Item I</b>                                                      |        |      |  |  |  |
| <b>Total (Column 6) to be carried forward to Grand Summary</b>                                                                                                                                                                                                |                                                                             |        |      |  |  |  |
| <p><b><u>Notes:</u></b></p> <p>1 The quantities mentioned in the BOQ are estimated quantities. These quantities are to be used for bid evaluation purpose only. The actual quantities may vary depending upon detailed engineering and approved drawings.</p> |                                                                             |        |      |  |  |  |

However, the unit rates for material and service quoted in the BOQ/ bid shall remain firm and final if design is unchanged.

- 2 Price of any other item specifically not covered in the Price Schedules but is required for the completion, commissioning and operation of the transmission line shall be deemed to be included in the Price Schedules.
- 3 In case of failure by the bidder to fill the price of Sales Tax in relevant column, the quoted price of the bidder will be considered inclusive of Sales Tax applicable as per Law and relevant provisions of the Bidding Documents. In case the bidder takes deviation or mention that prices are exclusive of PST, his bid shall be considered as non-responsive.
- 4 Foundation means four legs of tower.
- 5 An allowance of two percent (2%) of the total installed quantity will be permitted for sag, jumpers and wastage for the conductor and shield wire, one percent (1%) for OPGW and two percent (2%) for lossage of nuts, bolts and washers (for towers only); and one percent (1%) for insulator breakage. These allowances are the maximum permissible and in case of wastage less than these limits all excess material shall be returned to NGC storage yards by the Contractor. For quantities in excess of these limits, the Contractor shall replace or reimburse NGC for the loss. All unused, above allowable limits of waste materials and packing wood are the property of NGC and shall be returned to NGC storage yards by the Contractor.
- 6 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.
- 7 The Bidder shall quote prices against all items, including those for which the specified quantity is "0". No item shall be left blank or unpriced in the Price Schedule.
- 8 Pile Foundation design will be release after the submission of Pile load test Report.
- 9 Location for Sonic Integrity and sonic integrity test report approval will be accorded by the office of DG (C&SE) NGC.

**Name of  
Bidder**

**Signature  
of Bidder**

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme**  
**Lot-VIII: 500 kV S/C C5-Ludewala —Section B (Approx. 32 km)**

**SCHEDULE NO. 5 - GRAND SUMMARY**

| Sr. No.                                                         | Description                                                                                      | Bid Prices                 |                                |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------|--------------------------------|
|                                                                 |                                                                                                  | Foreign Currency Component | Local Currency Component (PKR) |
| 1                                                               | Total Schedule No. 1 Plant and Mandatory Spare Parts Supplied from Abroad                        |                            |                                |
| 2                                                               | Total Schedule No. 2 Plant and Mandatory Spare Parts Supplied from Within the Employer's Country |                            |                                |
| 3                                                               | Total Schedule No. 3 Design Services                                                             |                            |                                |
| 4                                                               | Total Schedule No. 4 Installation and Other Services                                             |                            |                                |
| 5                                                               | Provisional Sum                                                                                  |                            | 1,130 Million                  |
| <b>GRAND TOTAL to be carried forward to Letter of Price Bid</b> |                                                                                                  |                            |                                |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

- 1 Specify the currency in accordance with ITB 12 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-VIII: 500 kV S/C C5-Ludewala – Section B (Approx. 32 km)**  
**Schedule No. 6 - Recommended Spare Parts**

| Item | Description    | Qty | Unit Price                           |                                           | Total Price                  |                                |
|------|----------------|-----|--------------------------------------|-------------------------------------------|------------------------------|--------------------------------|
|      |                |     | EXW<br>Local Parts<br>Local Currency | CIP<br>Imported Parts<br>Foreign Currency | Local<br>Currency<br>Portion | Foreign<br>Currency<br>Portion |
| 1    | 2              | 3   | 4                                    | 5                                         | 6 = 3 x 4                    | 7 = 3 x 5                      |
|      | NOT APPLICABLE |     |                                      |                                           |                              |                                |
|      |                |     |                                      |                                           |                              |                                |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

# **Schedules of Rates and Prices**

## **(LOT-IX)**



| Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme |                                                                                                                                                                                                                                                                                                  |                                  |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|------------------------|------|----------|-----------------------------------|-----------|------------------------------------|-----------|-----------------------------|--------------------------------|----------|----------------|
| Lot-IX: 500 kV S/C C5-Ludewala —Section C (Approx. 29 km)                                                                                            |                                                                                                                                                                                                                                                                                                  |                                  |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| SCHEDULE NO.1- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM ABROAD                                                                                  |                                                                                                                                                                                                                                                                                                  |                                  |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| Item No.                                                                                                                                             | Description                                                                                                                                                                                                                                                                                      |                                  | Code Country of Origin | Unit | Quantity | Unit Price (CIF Pakistan Seaport) |           | Total Price (CIF Pakistan Seaport) |           | Total Inland Transportation | Total Price CIP (Project Site) |          | Taxes & Duties |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  |                                  |                        |      |          | CFR                               | Insurance | CFR                                | Insurance |                             | FCC                            | LCC      | Local Currency |
| 1                                                                                                                                                    | 2                                                                                                                                                                                                                                                                                                |                                  | 3                      | 4    | 5        | 6                                 | 7         | 8=5 x 6                            | 9 = 5 x 7 | 10                          | 11=8                           | 12= 9+10 | 13             |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  |                                  |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      | <u>500kV Single Circuit Transmission Line</u>                                                                                                                                                                                                                                                    |                                  |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| A                                                                                                                                                    | <u>Steel Towers</u>                                                                                                                                                                                                                                                                              |                                  |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| 1                                                                                                                                                    | Furnish 500kV Single circuit towers SGM, AGM ,DGM & TGM including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                                  |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      | (a)                                                                                                                                                                                                                                                                                              | <u>Tower Type "SGM"</u>          |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (i) Basic Tower Body             |                        | No.  | 69       |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (ii) 1.5 m Single Leg Extension  |                        | No.  | -        |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (iii) 3.0 m Single Leg Extension |                        | No.  | 56       |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (iv) 4.5 m Single Leg Extension  |                        | No.  | 108      |                                   |           |                                    |           |                             |                                |          |                |

|     |                         |                            |     |     |  |  |  |  |  |  |  |  |  |
|-----|-------------------------|----------------------------|-----|-----|--|--|--|--|--|--|--|--|--|
|     | (v)                     | 6.0 m Single Leg Extension | No. | 112 |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 4.5 m Body Extension       | No. | 8   |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | 9.0 m Body Extension       | No. | 10  |  |  |  |  |  |  |  |  |  |
|     | (viii)                  | Stubs                      | No. | 276 |  |  |  |  |  |  |  |  |  |
| (b) | <u>Tower Type "AGM"</u> |                            |     |     |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 13  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 1.5 m Single Leg Extension | No. | -   |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 3.0 m Single Leg Extension | No. | 12  |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 4.5 m Single Leg Extension | No. | 20  |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 6.0 m Single Leg Extension | No. | 20  |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 4.5 m Body Extension       | No. | 3   |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | 9.0 m Body Extension       | No. | 3   |  |  |  |  |  |  |  |  |  |
|     | (viii)                  | Stubs                      | No. | 52  |  |  |  |  |  |  |  |  |  |
| (c) | <u>Tower Type "DGM"</u> |                            |     |     |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 14  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 1.5 m Single Leg Extension | No. | -   |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 3.0 m Single Leg Extension | No. | 12  |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 4.5 m Single Leg Extension | No. | 20  |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 6.0 m Single Leg Extension | No. | 24  |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 4.5 m Body Extension       | No. | 3   |  |  |  |  |  |  |  |  |  |

|          |                                                              |                                                                |     |        |  |  |  |  |  |  |  |  |  |
|----------|--------------------------------------------------------------|----------------------------------------------------------------|-----|--------|--|--|--|--|--|--|--|--|--|
|          | (vii)                                                        | 9.0 m Body Extension                                           | No. | 3      |  |  |  |  |  |  |  |  |  |
|          | (viii)                                                       | Stubs                                                          | No. | 56     |  |  |  |  |  |  |  |  |  |
| (d)      | <u>Tower Type "TGM"</u>                                      |                                                                |     |        |  |  |  |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body                                               | No. | 2      |  |  |  |  |  |  |  |  |  |
|          | (ii)                                                         | 8.0 m Single Leg Extension                                     | No. | 8      |  |  |  |  |  |  |  |  |  |
|          | (iii)                                                        | Stubs                                                          | No. | 8      |  |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total A :</b>                                         |                                                                |     |        |  |  |  |  |  |  |  |  |  |
| <b>B</b> | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                                                                |     |        |  |  |  |  |  |  |  |  |  |
| 1        | Furnish 795 KCM ACSR "Drake" Conductor                       |                                                                | km  | 355.20 |  |  |  |  |  |  |  |  |  |
| 2        | Furnish                                                      |                                                                |     |        |  |  |  |  |  |  |  |  |  |
|          | (a)                                                          | OPGW with at least 24 fibers                                   | km  | 35     |  |  |  |  |  |  |  |  |  |
|          | (b)                                                          | Joint boxes for OPGW                                           |     |        |  |  |  |  |  |  |  |  |  |
|          | (i)                                                          | OPGW-OPGW (A Type)                                             | No. | 7      |  |  |  |  |  |  |  |  |  |
|          | (ii)                                                         | OPGW-OPGW Cable ( B Type)                                      | No. | -      |  |  |  |  |  |  |  |  |  |
|          | (iii)                                                        | OPGW-attaching Clamps                                          | No. | 420    |  |  |  |  |  |  |  |  |  |
|          | (iv)                                                         | Fibre Optic Approach Cable                                     | km  | -      |  |  |  |  |  |  |  |  |  |
|          | (c)                                                          | Test Equipment, Installation and Maintenance Tools             |     | -      |  |  |  |  |  |  |  |  |  |
|          | -                                                            | Fiber Optic Talk Set (Set comprised two units)                 | Set | 1      |  |  |  |  |  |  |  |  |  |
|          | -                                                            | Fiber Optic Tool Kit                                           | Set | 1      |  |  |  |  |  |  |  |  |  |
|          | -                                                            | OTDR with range $\geq 400$ km<br>Yokogawa AQ7260 or equivalent | Set | 1      |  |  |  |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                          |  |     |       |  |  |  |  |  |  |  |  |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|-------|--|--|--|--|--|--|--|--|
| 3        | Furnish 9.15 mm dia EHS Shieldwire                                                                                                                                                                                                                       |  | km  | 32.00 |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                          |  |     |       |  |  |  |  |  |  |  |  |
|          | <b>Sub Total B :</b>                                                                                                                                                                                                                                     |  |     |       |  |  |  |  |  |  |  |  |
| <b>C</b> | <b><u>Insulator Hardware Assemblies</u></b><br><b><u>(Complete Hardware Strings for Quad</u></b><br><b><u>Bundle ACSR Drake Conductor)</u></b>                                                                                                           |  |     |       |  |  |  |  |  |  |  |  |
| 1        | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'SGM' & TGM as per specification drawing No. NTDC/DESIGN/01E151       |  | Set | 213   |  |  |  |  |  |  |  |  |
| 2        | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. NTDC/DESIGN/01E153      |  | Set | 27    |  |  |  |  |  |  |  |  |
| 3        | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004 |  | Set | 54    |  |  |  |  |  |  |  |  |
| 4        | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower types 'AGM' & 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005            |  | Set | 162   |  |  |  |  |  |  |  |  |

|                      |                                                                                                                                                                                                                                     |  |         |    |  |  |  |  |  |  |  |  |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------|----|--|--|--|--|--|--|--|--|
| 5                    | Furnish Transposition Assembly Type IT(4) for tower type 'TGM' including 25x1 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. NTDC/DESIGN/01E152                          |  | Set     | 4  |  |  |  |  |  |  |  |  |
| 6                    | Furnish Double String Dead End Assemblies "DSD1(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010  |  | Set     | 3  |  |  |  |  |  |  |  |  |
| 7                    | Furnish Double String Dead End Assemblies "DSD2(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011 |  | Set     | 3  |  |  |  |  |  |  |  |  |
| 8                    | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assembles (items C1 - C7) with Coulomb or ElecNET software.                                                                |  | Lumpsum | 1  |  |  |  |  |  |  |  |  |
| <b>Sub-Total C :</b> |                                                                                                                                                                                                                                     |  |         |    |  |  |  |  |  |  |  |  |
| <b>D</b>             | <b><u>Hardware for OPGW &amp; Shieldwire</u></b>                                                                                                                                                                                    |  |         |    |  |  |  |  |  |  |  |  |
| 1                    | Furnish Suspension Assembly for OPGW including AGS clamp for single circuit tower type 'SGM' & 'TGM' as per specification                                                                                                           |  | Set     | 71 |  |  |  |  |  |  |  |  |
| 2                    | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification                                                                                                                                            |  | Set     | 7  |  |  |  |  |  |  |  |  |
| 3                    | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification                                                                                                                               |  | Set     | 27 |  |  |  |  |  |  |  |  |
| 4                    | Overhead shield wire suspension assembly for tower type 'SGM' & 'TGM' as per specification drawing                                                                                                                                  |  | Set     | 71 |  |  |  |  |  |  |  |  |

|          |                                                                                                                                                                          |  |       |       |  |  |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------|-------|--|--|--|--|--|--|--|--|
| 5        | Overhead shieldwire dead end assembly for tower type 'AGM' & 'DGM' as per specification drawing                                                                          |  | Set   | 54    |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total D :</b>                                                                                                                                                     |  |       |       |  |  |  |  |  |  |  |  |
| <b>E</b> | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |  |       |       |  |  |  |  |  |  |  |  |
| 1        | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 |  | No.   | 122   |  |  |  |  |  |  |  |  |
| 2        | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      |  | No.   | 61    |  |  |  |  |  |  |  |  |
| 3        | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. |  | No.   | 739   |  |  |  |  |  |  |  |  |
| 4        | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                |  | No.   | 2,120 |  |  |  |  |  |  |  |  |
| 5        | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor (See Note-3)                                                                                  |  | No.   | 530   |  |  |  |  |  |  |  |  |
| 6        | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         |  | No.   | 261   |  |  |  |  |  |  |  |  |
| 7        | Furnish stock bridge vibration dampers for Shield Wire.                                                                                                                  |  | No.   | 261   |  |  |  |  |  |  |  |  |
| 8        | Compression splice for 9.15mm dia EHS Shield Wire                                                                                                                        |  | No.   | 10    |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total E :</b>                                                                                                                                                     |  |       |       |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                          |  |       |       |  |  |  |  |  |  |  |  |
| <b>F</b> | <b><u>Grounding Material</u></b>                                                                                                                                         |  |       |       |  |  |  |  |  |  |  |  |
| 1        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            |  | No.   | 196   |  |  |  |  |  |  |  |  |
| 2        | Furnish flat to cable connector.                                                                                                                                         |  | No.   | 196   |  |  |  |  |  |  |  |  |
| 3        | Furnish cable to rod connector.                                                                                                                                          |  | No.   | 196   |  |  |  |  |  |  |  |  |
| 4        | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             |  | Meter | 588   |  |  |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                                                                  |                                |                            |     |    |  |  |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|----------------------------|-----|----|--|--|--|--|--|--|--|--|
|          | <b>Sub-Total F :</b>                                                                                                                                                                                                                                                                             |                                |                            |     |    |  |  |  |  |  |  |  |  |
| <b>G</b> | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                                                                                                                                              |                                |                            |     |    |  |  |  |  |  |  |  |  |
| <b>1</b> | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                       |                                |                            |     |    |  |  |  |  |  |  |  |  |
|          | Furnish 500kV Single circuit towers SGM, AGM ,DGM & TGM including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                                |                            |     |    |  |  |  |  |  |  |  |  |
|          | (a)                                                                                                                                                                                                                                                                                              | <b><u>Tower Type "SGM"</u></b> |                            |     |    |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (i)                            | Basic Tower Body           | No. | 7  |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (ii)                           | 1.5 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (iii)                          | 3.0 m Single Leg Extension | No. | 8  |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (iv)                           | 4.5 m Single Leg Extension | No. | 12 |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (v)                            | 6.0 m Single Leg Extension | No. | 12 |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (vi)                           | 4.5 m Body Extension       | No. | 2  |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (vii)                          | 9.0 m Body Extension       | No. | 2  |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (viii)                         | Stubs                      | No. | 28 |  |  |  |  |  |  |  |  |
|          | (b)                                                                                                                                                                                                                                                                                              | <b><u>Tower Type "AGM"</u></b> |                            |     |    |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (i)                            | Basic Tower Body           | No. | 3  |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (ii)                           | 1.5 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (iii)                          | 3.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (iv)                           | 4.5 m Single Leg Extension | No. | 8  |  |  |  |  |  |  |  |  |

|   |                                                              |                              |     |       |  |  |  |  |  |  |  |  |  |
|---|--------------------------------------------------------------|------------------------------|-----|-------|--|--|--|--|--|--|--|--|--|
|   | (v)                                                          | 6.0 m Single Leg Extension   | No. | 8     |  |  |  |  |  |  |  |  |  |
|   | (vi)                                                         | 4.5 m Body Extension         | No. | 2     |  |  |  |  |  |  |  |  |  |
|   | (vii)                                                        | 9.0 m Body Extension         | No. | 2     |  |  |  |  |  |  |  |  |  |
|   | (viii)                                                       | Stubs                        | No. | 12    |  |  |  |  |  |  |  |  |  |
|   | (c)                                                          | <u>Tower Type "DGM"</u>      |     |       |  |  |  |  |  |  |  |  |  |
|   | (i)                                                          | Basic Tower Body             | No. | 3     |  |  |  |  |  |  |  |  |  |
|   | (ii)                                                         | 1.5 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|   | (iii)                                                        | 3.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|   | (iv)                                                         | 4.5 m Single Leg Extension   | No. | 8     |  |  |  |  |  |  |  |  |  |
|   | (v)                                                          | 6.0 m Single Leg Extension   | No. | 8     |  |  |  |  |  |  |  |  |  |
|   | (vi)                                                         | 4.5 m Body Extension         | No. | 2     |  |  |  |  |  |  |  |  |  |
|   | (vii)                                                        | 9.0 m Body Extension         | No. | 2     |  |  |  |  |  |  |  |  |  |
|   | (viii)                                                       | Stubs                        | No. | 12    |  |  |  |  |  |  |  |  |  |
|   | (d)                                                          | <u>Tower Type "TGM"</u>      |     |       |  |  |  |  |  |  |  |  |  |
|   | (i)                                                          | Basic Tower Body             | No. | -     |  |  |  |  |  |  |  |  |  |
|   | (ii)                                                         | 6.0 m Single Leg Extension   | No. | -     |  |  |  |  |  |  |  |  |  |
|   | (iii)                                                        | Stubs                        | No. | -     |  |  |  |  |  |  |  |  |  |
|   | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                              |     |       |  |  |  |  |  |  |  |  |  |
| 2 | Furnish 795 KCM ACSR "Drake" Conductor                       |                              | km  | 35.20 |  |  |  |  |  |  |  |  |  |
| 3 | Furnish                                                      |                              |     |       |  |  |  |  |  |  |  |  |  |
|   | (a)                                                          | OPGW with at least 24 fibers | km  | 5     |  |  |  |  |  |  |  |  |  |



|   |                                                                                                                                                                                                                                                     |                                                    |                                                          |  |     |      |  |  |  |  |  |  |  |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------|--|-----|------|--|--|--|--|--|--|--|
|   | (b)                                                                                                                                                                                                                                                 | Joint boxes for OPGW                               |                                                          |  |     |      |  |  |  |  |  |  |  |
|   |                                                                                                                                                                                                                                                     | (i)                                                | OPGW-OPGW (A Type)                                       |  | No. | 1    |  |  |  |  |  |  |  |
|   |                                                                                                                                                                                                                                                     | (ii)                                               | OPGW-OPGW Cable ( B Type)                                |  | No. | -    |  |  |  |  |  |  |  |
|   |                                                                                                                                                                                                                                                     | (iii)                                              | OPGW-attaching Clamps                                    |  | No. | 42   |  |  |  |  |  |  |  |
|   |                                                                                                                                                                                                                                                     | (iv)                                               | Fibre Optic Approach Cable                               |  | km  | -    |  |  |  |  |  |  |  |
|   | (c)                                                                                                                                                                                                                                                 | Test Equipment, Installation and Maintenance Tools |                                                          |  |     | -    |  |  |  |  |  |  |  |
|   |                                                                                                                                                                                                                                                     | -                                                  | Fiber Optic Talk Set (Set comprised two units)           |  | Set | -    |  |  |  |  |  |  |  |
|   |                                                                                                                                                                                                                                                     | -                                                  | Fiber Optic Tool Kit                                     |  | Set | -    |  |  |  |  |  |  |  |
|   |                                                                                                                                                                                                                                                     | -                                                  | OTDR with range ≥ 400km<br>Yokogawa AQ7260 or equivalent |  | Set | -    |  |  |  |  |  |  |  |
| 4 | Furnish 9.15 mm dia EHS Shieldwire                                                                                                                                                                                                                  |                                                    |                                                          |  | km  | 3.20 |  |  |  |  |  |  |  |
|   | <b><u>Insulator Hardware Assemblies<br/>(Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                    |                                                    |                                                          |  |     |      |  |  |  |  |  |  |  |
| 5 | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'SGM' as per specification drawing No. NTDC/DESIGN/01E151        |                                                    |                                                          |  | Set | 21   |  |  |  |  |  |  |  |
| 6 | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. NTDC/DESIGN/01E153 |                                                    |                                                          |  | Set | 6    |  |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                                          |  |     |    |  |  |  |  |  |  |  |  |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|----|--|--|--|--|--|--|--|--|
| 7  | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004 |  | Set | 12 |  |  |  |  |  |  |  |  |
| 8  | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower types 'AGM' & 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005            |  | Set | 36 |  |  |  |  |  |  |  |  |
| 9  | Furnish Transposition Assembly Type IT(4) for tower type 'TGM' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. NTDC/DESIGN/01E152                                               |  | Set | -  |  |  |  |  |  |  |  |  |
| 10 | Furnish Double String Dead End Assemblies "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                       |  | Set | 3  |  |  |  |  |  |  |  |  |
| 11 | Furnish Double String Dead End Assemblies "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                      |  | Set | 3  |  |  |  |  |  |  |  |  |
|    | <b><u>Hardware for OPGW &amp; Shieldwire</u></b>                                                                                                                                                                                                         |  |     |    |  |  |  |  |  |  |  |  |
| 12 | Furnish Suspension Assembly for OPGW including AGS clamp for single circuit tower type 'SGM' & 'TGM' as per specification                                                                                                                                |  | Set | 7  |  |  |  |  |  |  |  |  |
| 13 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification                                                                                                                                                                 |  | Set | 1  |  |  |  |  |  |  |  |  |

|    |                                                                                                                                                                          |  |     |     |  |  |  |  |  |  |  |  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|-----|--|--|--|--|--|--|--|--|
| 14 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification                                                                    |  | Set | 6   |  |  |  |  |  |  |  |  |
| 15 | Overhead shield wire suspension assembly for tower type 'SGM' & 'TGM' as per specification drawing                                                                       |  | Set | 7   |  |  |  |  |  |  |  |  |
| 16 | Overhead shieldwire dead end assembly for tower type 'AGM' & 'DGM' as per specification drawing                                                                          |  | Set | 12  |  |  |  |  |  |  |  |  |
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |  |     |     |  |  |  |  |  |  |  |  |
| 17 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 |  | No. | 12  |  |  |  |  |  |  |  |  |
| 18 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      |  | No. | 6   |  |  |  |  |  |  |  |  |
| 19 | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. |  | No. | 185 |  |  |  |  |  |  |  |  |
| 20 | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                |  | No. | 313 |  |  |  |  |  |  |  |  |
| 21 | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor                                                                                               |  | No. | 78  |  |  |  |  |  |  |  |  |
| 22 | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         |  | No. | 40  |  |  |  |  |  |  |  |  |
| 23 | Furnish stock bridge vibration dampers for Shield Wire.                                                                                                                  |  | No. | 40  |  |  |  |  |  |  |  |  |
| 24 | Compression splice for 9.15 mm dia EHS Shield Wire                                                                                                                       |  | No. | 1   |  |  |  |  |  |  |  |  |
|    | <b><u>Grounding Material</u></b>                                                                                                                                         |  |     |     |  |  |  |  |  |  |  |  |
| 25 | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            |  | No. | 26  |  |  |  |  |  |  |  |  |
| 26 | Furnish flat to cable connector.                                                                                                                                         |  | No. | 26  |  |  |  |  |  |  |  |  |
| 27 | Furnish cable to rod connector.                                                                                                                                          |  | No. | 26  |  |  |  |  |  |  |  |  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                              |       |    |  |  |  |  |  |  |  |   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|----|--|--|--|--|--|--|--|---|
| 28                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Furnish 7 No. 10 copper covered ground wire. | Meter | 78 |  |  |  |  |  |  |  |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Sub-Total of G :</b>                      |       |    |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Total of Item A                              |       |    |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Total of Item B                              |       |    |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Total of Item C                              |       |    |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Total of Item D                              |       |    |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Total of Item E                              |       |    |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Total of Item F                              |       |    |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Total of Item G                              |       |    |  |  |  |  |  |  |  | - |
| <b>Grand Total of column No. 11 &amp; 12 to be carried forward to Grand summary</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                              |       |    |  |  |  |  |  |  |  | - |
| <p>* The Bidder shall specify the type of insulator being offered.</p> <p><b>Notes:</b></p> <p>1 Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types SGM, AGM, DGM, and TGM, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly.</p> <p>2 The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.</p> <p>3 The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.</p> <p>4 The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.</p> <p>5 The bidder shall be responsible to furnish the tower material, OPGW, Shield Wire, conductor, insulators, accessories, dampers &amp; hardware for conductor and OPGW, for completion of line in all respect. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.</p> |                                              |       |    |  |  |  |  |  |  |  |   |

- 6 The contractor shall transport, unload and stack leftover/additional material from site to NTDC designated Warehouse/Store at its own cost.
- 7 Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.
- 8 The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully before filling up the schedule of prices.
- 9 Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.
- 10 Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.
- 11 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.

**Signature of  
Bidder**

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for  
C-5 Power Evacuation Scheme  
Lot-IX: 500 kV S/C C5-Ludewala —Section C (Approx. 29 km)**

**SCHEDULE NO.2- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM WITHIN PAKISTAN**

| Item No. | Description                                                                                                                                                                                                                                                                                      |                         |                            | Unit | Quantity | Unit Price     |           | Total EXW Price | Total Inland Transportation | Total Price    | Sales and other Taxes & Duties (PKR) |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------|------|----------|----------------|-----------|-----------------|-----------------------------|----------------|--------------------------------------|
|          |                                                                                                                                                                                                                                                                                                  |                         |                            |      |          | Local Currency | EXW Price |                 |                             | Local Currency |                                      |
| 1        | 2                                                                                                                                                                                                                                                                                                |                         |                            | 3    | 4        | 5              | 6         | 7 = 4 x 6       | 8                           | 9 = 7+ 8       | 10                                   |
|          |                                                                                                                                                                                                                                                                                                  |                         |                            |      |          |                |           |                 |                             |                |                                      |
|          | <b><u>500kV Single Circuit Transmission Line</u></b>                                                                                                                                                                                                                                             |                         |                            |      |          |                |           |                 |                             |                |                                      |
| <b>A</b> | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                       |                         |                            |      |          |                |           |                 |                             |                |                                      |
| 1        | Furnish 500kV Single circuit towers SGM, AGM ,DGM & TGM including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                         |                            |      |          |                |           |                 |                             |                |                                      |
|          | (a)                                                                                                                                                                                                                                                                                              | <u>Tower Type "SGM"</u> |                            |      |          |                |           |                 |                             |                |                                      |
|          |                                                                                                                                                                                                                                                                                                  | (i)                     | Basic Tower Body           | No.  | 69       |                |           |                 |                             |                |                                      |
|          |                                                                                                                                                                                                                                                                                                  | (ii)                    | 1.5 m Single Leg Extension | No.  | -        |                |           |                 |                             |                |                                      |
|          |                                                                                                                                                                                                                                                                                                  | (iii)                   | 3.0 m Single Leg Extension | No.  | 56       |                |           |                 |                             |                |                                      |
|          |                                                                                                                                                                                                                                                                                                  | (iv)                    | 4.5 m Single Leg Extension | No.  | 108      |                |           |                 |                             |                |                                      |
|          |                                                                                                                                                                                                                                                                                                  | (v)                     | 6.0 m Single Leg Extension | No.  | 112      |                |           |                 |                             |                |                                      |
|          |                                                                                                                                                                                                                                                                                                  | (vi)                    | 4.5 m Body Extension       | No.  | 8        |                |           |                 |                             |                |                                      |
|          |                                                                                                                                                                                                                                                                                                  | (vii)                   | 9.0 m Body Extension       | No.  | 10       |                |           |                 |                             |                |                                      |
|          |                                                                                                                                                                                                                                                                                                  | (viii)                  | Stubs                      | No.  | 276      |                |           |                 |                             |                |                                      |

|          |                                                              |                              |                            |     |        |  |  |  |  |  |
|----------|--------------------------------------------------------------|------------------------------|----------------------------|-----|--------|--|--|--|--|--|
|          | (b)                                                          | <u>Tower Type "AGM"</u>      |                            |     |        |  |  |  |  |  |
|          |                                                              | (i)                          | Basic Tower Body           | No. | 13     |  |  |  |  |  |
|          |                                                              | (ii)                         | 1.5 m Single Leg Extension | No. | -      |  |  |  |  |  |
|          |                                                              | (iii)                        | 3.0 m Single Leg Extension | No. | 12     |  |  |  |  |  |
|          |                                                              | (iv)                         | 4.5 m Single Leg Extension | No. | 20     |  |  |  |  |  |
|          |                                                              | (v)                          | 6.0 m Single Leg Extension | No. | 20     |  |  |  |  |  |
|          |                                                              | (vi)                         | 4.5 m Body Extension       | No. | 3      |  |  |  |  |  |
|          |                                                              | (vii)                        | 9.0 m Body Extension       | No. | 3      |  |  |  |  |  |
|          |                                                              | (viii)                       | Stubs                      | No. | 52     |  |  |  |  |  |
|          | (c)                                                          | <u>Tower Type "DGM"</u>      |                            |     |        |  |  |  |  |  |
|          |                                                              | (i)                          | Basic Tower Body           | No. | 14     |  |  |  |  |  |
|          |                                                              | (ii)                         | 1.5 m Single Leg Extension | No. | -      |  |  |  |  |  |
|          |                                                              | (iii)                        | 3.0 m Single Leg Extension | No. | 12     |  |  |  |  |  |
|          |                                                              | (iv)                         | 4.5 m Single Leg Extension | No. | 20     |  |  |  |  |  |
|          |                                                              | (v)                          | 6.0 m Single Leg Extension | No. | 24     |  |  |  |  |  |
|          |                                                              | (vi)                         | 4.5 m Body Extension       | No. | 3      |  |  |  |  |  |
|          |                                                              | (vii)                        | 9.0 m Body Extension       | No. | 3      |  |  |  |  |  |
|          |                                                              | (viii)                       | Stubs                      | No. | 56     |  |  |  |  |  |
|          | (d)                                                          | <u>Tower Type "TGM"</u>      |                            |     |        |  |  |  |  |  |
|          |                                                              | (i)                          | Basic Tower Body           | No. | 2      |  |  |  |  |  |
|          |                                                              | (ii)                         | 8.0 m Single Leg Extension | No. | 8      |  |  |  |  |  |
|          |                                                              | (iii)                        | Stubs                      | No. | 8      |  |  |  |  |  |
|          | <b>Sub-Total A :</b>                                         |                              |                            |     |        |  |  |  |  |  |
| <b>B</b> | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                              |                            |     |        |  |  |  |  |  |
| 1        | Furnish 795 KCM ACSR "Drake" Conductor                       |                              |                            | km  | 355.20 |  |  |  |  |  |
| 2        | Furnish                                                      |                              |                            |     |        |  |  |  |  |  |
|          | (a)                                                          | OPGW with at least 24 fibers |                            | km  | 35     |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                     |                                                                   |     |       |  |  |  |  |  |  |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|-----|-------|--|--|--|--|--|--|
|          | (b)                                                                                                                                                                                                                                                 | Joint boxes for OPGW                                              |     |       |  |  |  |  |  |  |
|          | (i)                                                                                                                                                                                                                                                 | OPGW-OPGW (A Type)                                                | No. | 7     |  |  |  |  |  |  |
|          | (ii)                                                                                                                                                                                                                                                | OPGW-OPGW Cable ( B Type)                                         | No. | -     |  |  |  |  |  |  |
|          | (iii)                                                                                                                                                                                                                                               | OPGW-attaching Clamps                                             | No. | 420   |  |  |  |  |  |  |
|          | (iv)                                                                                                                                                                                                                                                | Fibre Optic Approach Cable                                        | km  | -     |  |  |  |  |  |  |
|          | (c)                                                                                                                                                                                                                                                 | Test Equipment, Installation and Maintenance Tools                |     | -     |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                   | Fiber Optic Talk Set (Set comprised two units)                    | Set | 1     |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                   | Fiber Optic Tool Kit                                              | Set | 1     |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                   | OTDR with range $\geq 400\text{km}$ Yokogawa AQ7260 or equivalent | Set | 1     |  |  |  |  |  |  |
| 3        | Furnish 9.15 mm dia EHS Shieldwire                                                                                                                                                                                                                  |                                                                   | km  | 32.00 |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                     |                                                                   |     |       |  |  |  |  |  |  |
|          | <b>Sub Total B :</b>                                                                                                                                                                                                                                |                                                                   |     |       |  |  |  |  |  |  |
| <b>C</b> | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                        |                                                                   |     |       |  |  |  |  |  |  |
| 1        | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'SGM' & TGM as per specification drawing No. NTDC/DESIGN/01E151  |                                                                   | Set | 213   |  |  |  |  |  |  |
| 2        | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. NTDC/DESIGN/01E153 |                                                                   | Set | 27    |  |  |  |  |  |  |



|          |                                                                                                                                                                                                                                                          |         |     |  |  |  |  |  |  |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|--|--|--|--|--|--|
| 3        | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004 | Set     | 54  |  |  |  |  |  |  |
| 4        | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower types 'AGM' & 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005            | Set     | 162 |  |  |  |  |  |  |
| 5        | Furnish Transposition Assembly Type IT(4) for tower type 'TGM' including 25x1 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. NTDC/DESIGN/01E152                                               | Set     | 4   |  |  |  |  |  |  |
| 6        | Furnish Double String Dead End Assemblies "DSD1(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                       | Set     | 3   |  |  |  |  |  |  |
| 7        | Furnish Double String Dead End Assemblies "DSD2(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                      | Set     | 3   |  |  |  |  |  |  |
| 8        | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assemblies (items C1 - C7) with Coulomb or ElecNET software.                                                                                    | Lumpsum | 1   |  |  |  |  |  |  |
|          | <b>Sub-Total C :</b>                                                                                                                                                                                                                                     |         |     |  |  |  |  |  |  |
| <b>D</b> | <b>Hardware for OPGW &amp; Shieldwire</b>                                                                                                                                                                                                                |         |     |  |  |  |  |  |  |

|          |                                                                                                                                                                          |     |       |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|--|--|--|--|--|--|
| 1        | Furnish Suspension Assembly for OPGW including AGS clamp for single circuit tower type 'SGM' & 'TGM' as per specification                                                | Set | 71    |  |  |  |  |  |  |
| 2        | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification                                                                                 | Set | 7     |  |  |  |  |  |  |
| 3        | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification                                                                    | Set | 27    |  |  |  |  |  |  |
| 4        | Overhead shield wire suspension assembly for tower type 'SGM' & 'TGM' as per specification drawing                                                                       | Set | 71    |  |  |  |  |  |  |
| 5        | Overhead shieldwire dead end assembly for tower type 'AGM' & 'DGM' as per specification drawing                                                                          | Set | 54    |  |  |  |  |  |  |
|          | <b>Sub-Total D :</b>                                                                                                                                                     |     |       |  |  |  |  |  |  |
| <b>E</b> | <b>Accessories and Dampers</b>                                                                                                                                           |     |       |  |  |  |  |  |  |
| 1        | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 | No. | 122   |  |  |  |  |  |  |
| 2        | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      | No. | 61    |  |  |  |  |  |  |
| 3        | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No. | 739   |  |  |  |  |  |  |
| 4        | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No. | 2,120 |  |  |  |  |  |  |
| 5        | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor (See Note-3)                                                                                  | No. | 530   |  |  |  |  |  |  |
| 6        | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No. | 261   |  |  |  |  |  |  |
| 7        | Furnish stock bridge vibration dampers for Shield Wire.                                                                                                                  | No. | 261   |  |  |  |  |  |  |
| 8        | Compression splice for 9.15mm dia EHS Shield Wire                                                                                                                        | No. | 10    |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                                                                  |                         |                            |     |    |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------|-----|----|--|--|--|--|--|
|          | <b>Sub-Total E :</b>                                                                                                                                                                                                                                                                             |                         |                            |     |    |  |  |  |  |  |
| <b>F</b> | <b><u>Grounding Material</u></b>                                                                                                                                                                                                                                                                 |                         |                            |     |    |  |  |  |  |  |
| 1        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                                                                                                                                                    |                         | No.                        | 196 |    |  |  |  |  |  |
| 2        | Furnish flat to cable connector.                                                                                                                                                                                                                                                                 |                         | No.                        | 196 |    |  |  |  |  |  |
| 3        | Furnish cable to rod connector.                                                                                                                                                                                                                                                                  |                         | No.                        | 196 |    |  |  |  |  |  |
| 4        | Furnish 7 No. 10 copper covered ground wire.                                                                                                                                                                                                                                                     |                         | Meter                      | 588 |    |  |  |  |  |  |
|          | <b>Sub-Total F :</b>                                                                                                                                                                                                                                                                             |                         |                            |     |    |  |  |  |  |  |
| <b>G</b> | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                                                                                                                                              |                         |                            |     |    |  |  |  |  |  |
| <b>1</b> | <b><u>Steel Towers</u></b>                                                                                                                                                                                                                                                                       |                         |                            |     |    |  |  |  |  |  |
|          | Furnish 500kV Single circuit towers SGM, AGM ,DGM & TGM including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                         |                            |     |    |  |  |  |  |  |
|          | (a)                                                                                                                                                                                                                                                                                              | <u>Tower Type "SGM"</u> |                            |     |    |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (i)                     | Basic Tower Body           | No. | 7  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (ii)                    | 1.5 m Single Leg Extension | No. | 4  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (iii)                   | 3.0 m Single Leg Extension | No. | 8  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (iv)                    | 4.5 m Single Leg Extension | No. | 12 |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (v)                     | 6.0 m Single Leg Extension | No. | 12 |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (vi)                    | 4.5 m Body Extension       | No. | 2  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (vii)                   | 9.0 m Body Extension       | No. | 2  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (viii)                  | Stubs                      | No. | 28 |  |  |  |  |  |
|          | (b)                                                                                                                                                                                                                                                                                              | <u>Tower Type "AGM"</u> |                            |     |    |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (i)                     | Basic Tower Body           | No. | 3  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (ii)                    | 1.5 m Single Leg Extension | No. | 4  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (iii)                   | 3.0 m Single Leg Extension | No. | 4  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                                                                  | (iv)                    | 4.5 m Single Leg Extension | No. | 8  |  |  |  |  |  |

|   |                                                              |                                                    |     |       |  |  |  |  |  |  |
|---|--------------------------------------------------------------|----------------------------------------------------|-----|-------|--|--|--|--|--|--|
|   | (v)                                                          | 6.0 m Single Leg Extension                         | No. | 8     |  |  |  |  |  |  |
|   | (vi)                                                         | 4.5 m Body Extension                               | No. | 2     |  |  |  |  |  |  |
|   | (vii)                                                        | 9.0 m Body Extension                               | No. | 2     |  |  |  |  |  |  |
|   | (viii)                                                       | Stubs                                              | No. | 12    |  |  |  |  |  |  |
|   | (c)                                                          | <u>Tower Type "DGM"</u>                            |     |       |  |  |  |  |  |  |
|   | (i)                                                          | Basic Tower Body                                   | No. | 3     |  |  |  |  |  |  |
|   | (ii)                                                         | 1.5 m Single Leg Extension                         | No. | 4     |  |  |  |  |  |  |
|   | (iii)                                                        | 3.0 m Single Leg Extension                         | No. | 4     |  |  |  |  |  |  |
|   | (iv)                                                         | 4.5 m Single Leg Extension                         | No. | 8     |  |  |  |  |  |  |
|   | (v)                                                          | 6.0 m Single Leg Extension                         | No. | 8     |  |  |  |  |  |  |
|   | (vi)                                                         | 4.5 m Body Extension                               | No. | 2     |  |  |  |  |  |  |
|   | (vii)                                                        | 9.0 m Body Extension                               | No. | 2     |  |  |  |  |  |  |
|   | (viii)                                                       | Stubs                                              | No. | 12    |  |  |  |  |  |  |
|   | (d)                                                          | <u>Tower Type "TGM"</u>                            |     |       |  |  |  |  |  |  |
|   | (i)                                                          | Basic Tower Body                                   | No. | -     |  |  |  |  |  |  |
|   | (ii)                                                         | 6.0 m Single Leg Extension                         | No. | -     |  |  |  |  |  |  |
|   | (iii)                                                        | Stubs                                              | No. | -     |  |  |  |  |  |  |
|   | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                                                    |     |       |  |  |  |  |  |  |
| 2 | Furnish 795 KCM ACSR "Drake" Conductor                       |                                                    | km  | 35.20 |  |  |  |  |  |  |
| 3 | Furnish                                                      |                                                    |     |       |  |  |  |  |  |  |
|   | (a)                                                          | OPGW with at least 24 fibers                       | km  | 5     |  |  |  |  |  |  |
|   | (b)                                                          | Joint boxes for OPGW                               |     |       |  |  |  |  |  |  |
|   | (i)                                                          | OPGW-OPGW (A Type)                                 | No. | 1     |  |  |  |  |  |  |
|   | (ii)                                                         | OPGW-OPGW Cable ( B Type)                          | No. | -     |  |  |  |  |  |  |
|   | (iii)                                                        | OPGW-attaching Clamps                              | No. | 42    |  |  |  |  |  |  |
|   | (iv)                                                         | Fibre Optic Approach Cable                         | km  | -     |  |  |  |  |  |  |
|   | (c)                                                          | Test Equipment, Installation and Maintenance Tools |     | -     |  |  |  |  |  |  |
|   | -                                                            | Fiber Optic Talk Set (Set comprised two units)     | Set | -     |  |  |  |  |  |  |

|   |   |                                                                                                                                                                                                                                                          |     |      |  |  |  |  |  |  |
|---|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|--|--|--|--|--|--|
|   | - | Fiber Optic Tool Kit                                                                                                                                                                                                                                     | Set | -    |  |  |  |  |  |  |
|   | - | OTDR with range $\geq 400$ km<br>Yokogawa AQ7260 or equivalent                                                                                                                                                                                           | Set | -    |  |  |  |  |  |  |
| 4 |   | Furnish 9.15 mm dia EHS Shieldwire                                                                                                                                                                                                                       | km  | 3.20 |  |  |  |  |  |  |
|   |   | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                             |     |      |  |  |  |  |  |  |
| 5 |   | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'SGM' as per specification drawing No. NTDC/DESIGN/01E151             | Set | 21   |  |  |  |  |  |  |
| 6 |   | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. NTDC/DESIGN/01E153      | Set | 6    |  |  |  |  |  |  |
| 7 |   | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004 | Set | 12   |  |  |  |  |  |  |
| 8 |   | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower types 'AGM' & 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005            | Set | 36   |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                     |     |    |  |  |  |  |  |  |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|--|--|--|--|--|--|
| 9  | Furnish Transposition Assembly Type IT(4) for tower type 'TGM' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. NTDC/DESIGN/01E152                          | Set | -  |  |  |  |  |  |  |
| 10 | Furnish Double String Dead End Assemblies "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010  | Set | 3  |  |  |  |  |  |  |
| 11 | Furnish Double String Dead End Assemblies "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011 | Set | 3  |  |  |  |  |  |  |
|    | <b><u>Hardware for OPGW &amp; Shieldwire</u></b>                                                                                                                                                                                    |     |    |  |  |  |  |  |  |
| 12 | Furnish Suspension Assembly for OPGW including AGS clamp for single circuit tower type 'SGM' & 'TGM' as per specification                                                                                                           | Set | 7  |  |  |  |  |  |  |
| 13 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification                                                                                                                                            | Set | 1  |  |  |  |  |  |  |
| 14 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification                                                                                                                               | Set | 6  |  |  |  |  |  |  |
| 15 | Overhead shield wire suspension assembly for tower type 'SGM' & 'TGM' as per specification drawing                                                                                                                                  | Set | 7  |  |  |  |  |  |  |
| 16 | Overhead shieldwire dead end assembly for tower type 'AGM' & 'DGM' as per specification drawing                                                                                                                                     | Set | 12 |  |  |  |  |  |  |
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                                                                               |     |    |  |  |  |  |  |  |
| 17 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                                                                            | No. | 12 |  |  |  |  |  |  |

|    |                                                                                                                                                                          |       |     |  |  |  |  |  |   |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|--|--|--|--|--|---|
| 18 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      | No.   | 6   |  |  |  |  |  |   |
| 19 | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No.   | 185 |  |  |  |  |  |   |
| 20 | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No.   | 313 |  |  |  |  |  |   |
| 21 | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor                                                                                               | No.   | 78  |  |  |  |  |  |   |
| 22 | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No.   | 40  |  |  |  |  |  |   |
| 23 | Furnish stock bridge vibration dampers for Shield Wire.                                                                                                                  | No.   | 40  |  |  |  |  |  |   |
| 24 | Compression splice for 9.15 mm dia EHS Shield Wire                                                                                                                       | No.   | 1   |  |  |  |  |  |   |
|    | <b><u>Grounding Material</u></b>                                                                                                                                         |       |     |  |  |  |  |  |   |
| 25 | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            | No.   | 26  |  |  |  |  |  |   |
| 26 | Furnish flat to cable connector.                                                                                                                                         | No.   | 26  |  |  |  |  |  |   |
| 27 | Furnish cable to rod connector.                                                                                                                                          | No.   | 26  |  |  |  |  |  |   |
| 28 | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             | Meter | 78  |  |  |  |  |  |   |
|    | <b>Sub-Total of G :</b>                                                                                                                                                  |       |     |  |  |  |  |  | - |
|    | Total of Item A                                                                                                                                                          |       |     |  |  |  |  |  | - |
|    | Total of Item B                                                                                                                                                          |       |     |  |  |  |  |  | - |
|    | Total of Item C                                                                                                                                                          |       |     |  |  |  |  |  | - |
|    | Total of Item D                                                                                                                                                          |       |     |  |  |  |  |  | - |
|    | Total of Item E                                                                                                                                                          |       |     |  |  |  |  |  | - |
|    | Total of Item F                                                                                                                                                          |       |     |  |  |  |  |  | - |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |  |   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|---|
| Total of Item G                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |  | - |
| Total of Column 9 to be forwarded to Grand Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |  |   |
| <p>* The Bidder shall specify the type of insulator being offered.</p> <p><b>Notes:</b></p> <p>Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types SGM, AGM, DGM, and TGM, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly.</p> <p>The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.</p> <p>The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.</p> <p>The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.</p> <p>The bidder shall be responsible to furnish the tower material, OPGW, Shield Wire, conductor, insulators, accessories, dampers &amp; hardware for conductor and OPGW, for completion of line in all respect. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.</p> <p>The contractor shall transport, unload and stack leftover/additional material from site to NTDC designated Warehouse/Store at its own cost.</p> <p>Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.</p> <p>The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully before filling up the schedule of prices.</p> <p>Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.</p> <p>Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.</p> <p>In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.</p> |  |  |  |  |  |   |



**Signature of Bidder**

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-IX: 500 kV S/C C5-Ludewala – Section C (Approx. 29 km)**

**Schedule No.3 - Design Services**

| Item                                                  | Description | Qty. | Unit Price <sup>1</sup><br>Local<br>Currency | Total Price | Total<br>Provincial<br>Sales Tax |
|-------------------------------------------------------|-------------|------|----------------------------------------------|-------------|----------------------------------|
| 1                                                     | 2           | 3    | 4                                            | 5 = 3 x 4   | 6                                |
| 1                                                     |             | Lot  |                                              |             |                                  |
| NOT APPLICABLE                                        |             |      |                                              |             |                                  |
| 2                                                     |             | Lot  |                                              |             |                                  |
| 3                                                     |             | Lot  |                                              |             |                                  |
| TOTAL Column 5 to be carried forward to Grand Summary |             |      |                                              |             |                                  |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>1</sup>Specify currency in accordance ITB 12.

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme  
Lot-IX: 500 kV S/C C5-Ludewala —Section C (Approx. 29 km)**

**SCHEDULE NO.4 - INSTALLATION AND OTHER SERVICES**

**(INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)**

| Item No. | Description                                                                               | Unit     | Qty | Unit Price (PKR) | Total Price (PKR) Including all Custom duties, taxes and other levies etc. w/o Provincial Sales Tax | Total Provincial Sales tax (PST) in PKR |
|----------|-------------------------------------------------------------------------------------------|----------|-----|------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------|
| 1        | 2                                                                                         | 3        | 4   | 5                | 6=4*5                                                                                               | 7                                       |
|          | <b>INSTALLATION (INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)</b> |          |     |                  |                                                                                                     |                                         |
| A        | <u>Survey</u>                                                                             |          |     |                  |                                                                                                     |                                         |
| 1        | Clearing Right of Way (ROW)                                                               | Lump Sum | 1   |                  |                                                                                                     |                                         |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |     |  |  |  |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----|--|--|--|
| 2        | Validation of already established centre line prior to foundation construction and preparation of as-built plan & profile drawings of the already prepared plan & profile drawings using PLS-CADD and construction structure lists (to be provided to the Contractor after award of contract) of the constructed transmission line after incorporating all the changes and submitted to the Project Manager. In case of route diversion, payment of the diverted portion will be made as per item A.3 | km        | 29  |  |  |  |
| 3        | Route alignment and detailed surveying of diverted portion not limited to chainage and leveling, preparation of plan & profile drawings, spotting of towers and preparation of construction structure list & Latitude & Longitude with hand held GPS of each tower location                                                                                                                                                                                                                           | km        | 2.9 |  |  |  |
|          | <b>Sub-Total A:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |     |  |  |  |
| <b>B</b> | <b><u>Sub-soil Investigations:</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |     |  |  |  |
|          | Sub-Soil Investigation for T/Line at (ii) and confirmatory sub-soil Investigation in varied soil/boulder/rock (including laboratory tests) as per Specifications (Technical Provisions for Construction Clause 10.2) and submission of Sub-Soil Investigation Report.                                                                                                                                                                                                                                 |           |     |  |  |  |
| (a)      | From NSL to depth of 15 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Lin. Mtr. | 45  |  |  |  |
| (b)      | From 15 m to depth of 25 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Lin. Mtr. | 10  |  |  |  |
| (c)      | Hand Auger upto depth of 10m                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Lin. Mtr. | 40  |  |  |  |
|          | <b>Sub-Total B:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |     |  |  |  |
| <b>C</b> | <b><u>Foundations</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |     |  |  |  |

|          |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |   |  |  |  |
|----------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---|--|--|--|
|          |                                | Reinforced Concrete Spread Foundations (4 legs) complete in all respect in varied soil as well as boulders/rock complete with supply of materials including alignment, peg marking, access, preparatory works, excavation, blasting, leveling, grading of tower site, cutting, dewatering, shuttering, reinforcement, concreting (using Sulphate Resistance Cement conforming to ASTM C-150 Type-V), lean concrete (if required), curing, backfilling of foundations after concreting with excavated/borrowed earth (irrespective of lead), application of three (03) coats hot bitumen (ExpanProof* 10 – Fospak bitumen and compaction of backfill material in layers, stub setting and site restoration etc. including tower staking (Latitude & Longitude with hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type as per drawings and specifications: |            |   |  |  |  |
|          | (a)                            | SGM (Complete Foundation 4 Legs) as per Drawing No.3206/169/TD/01G100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |   |  |  |  |
|          | (i)                            | Foundation Type D0 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 3 |  |  |  |
|          | (ii)                           | Foundation Type D1 (Dry) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Foundation | 0 |  |  |  |
|          | (iii)                          | Foundation Type S1 (Semi-Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Foundation | 0 |  |  |  |
|          | (iv)                           | Foundation Type W (Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Foundation | 0 |  |  |  |
|          | (b)                            | AGM (Complete Foundation 4 Legs) as per Drawing No. 3206/169/TD/01G101                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |   |  |  |  |
|          | (i)                            | Foundation Type D0 (Dry) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Foundation | 0 |  |  |  |
|          | (ii)                           | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Foundation | 0 |  |  |  |
|          | (c)                            | DGM (Complete Foundation 4 Legs) as per Drawing No. 3206/169/TD/01G102                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |   |  |  |  |
|          | (i)                            | Foundation Type D0 (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 1 |  |  |  |
|          | (ii)                           | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Foundation | 0 |  |  |  |
|          | <b>Sub-Total C:</b>            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |   |  |  |  |
| <b>D</b> | <b><u>Pile Foundations</u></b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |   |  |  |  |

|  |     |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |           |  |  |  |
|--|-----|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|--|--|--|
|  | D-1 |      | Reinforced concrete pile foundations (cast in situ installation) complete in all type of soil as well as boulders/gravels/rock with supply of materials including excavation, drilling/boring, shuttering, reinforcement, concreting, bitumen coating, backfilling, installation of Stubs, tower grounding, site clearing etc. using Sulphate Resistance Cement conforming to ASTM C-150 Type-V shall be used including tower staking (Latitude & Longitude with RTK/hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type: |            |           |  |  |  |
|  | (a) |      | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, SGM, and drawing No. <b>3206/169/TD/01G110</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Foundation | <b>55</b> |  |  |  |
|  | (b) |      | Reinforced concrete single pile per footing 900 mm dia. as per drawing No. <b>3206/169/TD/01G110</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |           |  |  |  |
|  |     | (i)  | Pile shaft upto depth of 8 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Lin.mtr    | 1,760     |  |  |  |
|  |     | (ii) | Pile shaft upto depth 08 - 13 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Lin.mtr    | 120       |  |  |  |
|  | (c) |      | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, AGM, and drawing No. <b>3206/169/TD/01G111</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Foundation | <b>7</b>  |  |  |  |
|  | (d) |      | Reinforced concrete single pile per footing 900 mm dia. as per drawing No. <b>3206/169/TD/01G111</b> (including steel liner/casing), if required.                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |           |  |  |  |
|  |     | (i)  | Pile shaft upto depth of 15 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Lin.mtr    | 420       |  |  |  |
|  |     | (ii) | Pile shaft depth 15 - 20 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lin.mtr    | 140       |  |  |  |
|  | (e) |      | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DGM, and drawing No. <b>3206/169/TD/01G112</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Foundation | <b>7</b>  |  |  |  |

|  |       |                                                                                                                                                        |            |     |  |  |  |
|--|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|--|--|--|
|  | (f)   | Reinforced concrete single pile per footing 1200 mm dia. as per drawing No. <b>3206/169/TD/01G112</b> (including steel liner/casing), if required.     |            |     |  |  |  |
|  | (i)   | Pile shaft upto depth of 15 m                                                                                                                          | Lin.mtr    | 560 |  |  |  |
|  | (ii)  | Pile shaft depth 15 - 20 m                                                                                                                             | Lin.mtr    | 140 |  |  |  |
|  | (g)   | Reinforced concrete pile caps with Tie Beam and stub setting as per tower type and drawing No. <b>3206/169/TD/01G118</b>                               | Foundation | 8   |  |  |  |
|  | (h)   | Reinforced concrete single pile per footing 1200 mm dia. as per drawing No. <b>3206/169/TD/01G118</b>                                                  |            |     |  |  |  |
|  | (i)   | Pile shaft upto depth of 20 m                                                                                                                          | Lin.mtr    | 640 |  |  |  |
|  | (ii)  | Pile shaft depth 20 - 25 m                                                                                                                             | Lin.mtr    | 160 |  |  |  |
|  | (iii) | Pile shaft depth 25 - 30 m                                                                                                                             | Lin.mtr    | 160 |  |  |  |
|  | (iii) | Pile shaft depth 30 - 35 m                                                                                                                             | Lin.mtr    | 40  |  |  |  |
|  | (i)   | Reinforced concrete pile caps with Tie Beam and stub setting as per tower type and drawing No. <b>3206/169/TD/01G119</b>                               | Foundation | 3   |  |  |  |
|  | (j)   | Reinforced concrete single pile per footing 1200 mm dia. as per drawing No. <b>3206/169/TD/01G119</b>                                                  |            |     |  |  |  |
|  | (i)   | Pile shaft upto depth of 20 m                                                                                                                          | Lin.mtr    | 240 |  |  |  |
|  | (ii)  | Pile shaft depth 20 - 30 m                                                                                                                             | Lin.mtr    | 120 |  |  |  |
|  | (iii) | Pile shaft depth 30 - 40 m                                                                                                                             | Lin.mtr    | 80  |  |  |  |
|  | D-2   | Pile load test in compression confirming to ASTM D1143 / D1143M and in uplift confirming to ASTM D3689 / D3689M at 2.5 times of tower foundation loads |            |     |  |  |  |
|  |       |                                                                                                                                                        |            |     |  |  |  |

|          |                                                                                                                                                                                                                                                            |                                                                                                                                                         |            |       |  |  |  |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------|--|--|--|
|          | (a)                                                                                                                                                                                                                                                        | SGM (In Compression)                                                                                                                                    | Pile       | 1     |  |  |  |
|          | (b)                                                                                                                                                                                                                                                        | SGM (In Tension/Uplift)                                                                                                                                 | Pile       | 1     |  |  |  |
|          | (c)                                                                                                                                                                                                                                                        | DGM (In Compression)                                                                                                                                    | Pile       | 1     |  |  |  |
|          | (d)                                                                                                                                                                                                                                                        | DGM (In Tension/Uplift)                                                                                                                                 | Pile       | 1     |  |  |  |
|          | (e)                                                                                                                                                                                                                                                        | Reinforced concrete single Test pile per footing 900 mm dia. as per drawing No. 3206/169/TD/01G110 (including steel liner/casing), if required.         |            | 2     |  |  |  |
|          | (i)                                                                                                                                                                                                                                                        | Pile shaft upto depth of 8 m                                                                                                                            | Lin.mtr    | 16    |  |  |  |
|          | (ii)                                                                                                                                                                                                                                                       | Pile shaft upto depth 08 - 13 m                                                                                                                         | Lin.mtr    | 10    |  |  |  |
|          | (f)                                                                                                                                                                                                                                                        | Reinforced concrete single Test pile per footing 1200 mm dia. as per drawing No. <b>3206/169/TD/01G119</b> (including steel liner/casing), if required. |            | 2     |  |  |  |
|          | (i)                                                                                                                                                                                                                                                        | Pile shaft upto depth of 20 m                                                                                                                           | Lin.mtr    | 40    |  |  |  |
|          | (ii)                                                                                                                                                                                                                                                       | Pile shaft depth 20 - 30 m                                                                                                                              | Lin.mtr    | 20    |  |  |  |
|          | (iii)                                                                                                                                                                                                                                                      | Pile shaft depth 30 - 35 m                                                                                                                              | Lin.mtr    | 10    |  |  |  |
|          | D-6                                                                                                                                                                                                                                                        | Sonic Integrity Test at pile foundation confirming to ASTM D5882                                                                                        | No.        | 70    |  |  |  |
|          | <b>Sub-Total D:</b>                                                                                                                                                                                                                                        |                                                                                                                                                         |            |       |  |  |  |
| <b>E</b> | <b><u>Erection of Steel Towers</u></b>                                                                                                                                                                                                                     |                                                                                                                                                         |            |       |  |  |  |
| 1        | Transport and Install 500kV single circuit towers type SGM, AGM, DGM & TGM with all accessories i.e anti climbing devices, aerial markers number plates, danger signs, phase plates, Bird Guards etc. in accordance with requirements of Bidding Documents |                                                                                                                                                         | Ton        | 1,112 |  |  |  |
| 2        | Welding of erected tower bolts & nuts after final inspection upto height of 8.0 m from top of foundation chimney as per specification drawing                                                                                                              |                                                                                                                                                         | Each tower | 98    |  |  |  |



|          |                                                                                                                                                                                                                                                                                 |                    |      |  |  |   |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------|--|--|---|
|          | <b>Sub-Total E:</b>                                                                                                                                                                                                                                                             |                    |      |  |  |   |
| <b>F</b> | <b><u>Stringing of Conductor and OPGW</u></b>                                                                                                                                                                                                                                   |                    |      |  |  |   |
| 1        | Transport & Install 795KCM ACSR Drake for quad conductor configuration insulator hanging, hardware assemblies, accessories & dampers etc. complete in all respects as per specifications & approved drawings and methodology.                                                   | km D/C Quad Bundle | 29   |  |  |   |
| 2        | Transport & Install OPGW including installation of drop down lengths for joint boxes at the towers along with allied hardware material including hardware assemblies, joint boxes accessories, dampers etc. complete in all respects as per specifications & approved drawings. | km (on Both Peaks) | 29   |  |  |   |
|          | <b>Sub-Total F:</b>                                                                                                                                                                                                                                                             |                    |      |  |  |   |
| <b>G</b> | <b><u>Testing &amp; Commissioning</u></b>                                                                                                                                                                                                                                       |                    |      |  |  |   |
| 1        | Testing and commissioning of the line                                                                                                                                                                                                                                           | Lumpsum            | 1    |  |  |   |
|          | <b>Sub-Total G:</b>                                                                                                                                                                                                                                                             |                    |      |  |  |   |
| <b>H</b> | <b><u>ENVIRONMENTAL AND SOCIAL SAFEGUARDS</u></b>                                                                                                                                                                                                                               |                    |      |  |  |   |
| 1        | Tree Plantation (Minimum height 4 feet)                                                                                                                                                                                                                                         | No.                | 3000 |  |  |   |
| 2        | Water quality monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route.                                                                                                                                            | No.                | 28   |  |  |   |
| 3        | Ambient Air monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route.                                                                                                                                              | No.                | 28   |  |  |   |
| 4        | Noise monitoring / analysis / measurement on quarterly basis for the whole project period at three locations along the TL route.                                                                                                                                                | No.                | 28   |  |  |   |
|          | <b>Sub-Total H:</b>                                                                                                                                                                                                                                                             |                    |      |  |  | - |
|          |                                                                                                                                                                                                                                                                                 |                    |      |  |  |   |

|                                                                |                                                                             |           |      |  |  |  |
|----------------------------------------------------------------|-----------------------------------------------------------------------------|-----------|------|--|--|--|
| <b>I</b>                                                       | <b><u>INSTALLATION SERVICES FOR ADDITIONAL WORK</u></b>                     |           |      |  |  |  |
| 1                                                              | Grading/Cutting/Excavation (Dry Soil)                                       | Cu. m.    | 60   |  |  |  |
| 2                                                              | Excavation (semi-submerged soil)                                            | Cu. m.    | 40   |  |  |  |
| 3                                                              | Excavation (submerged soil)                                                 | Cu. m.    | 40   |  |  |  |
| 4                                                              | Blasting/Cutting/Excavation/Grading (boulder/Rock)                          | Cu. m.    | 50   |  |  |  |
| 5                                                              | Concrete (3000 psi at 28 days) furnished and installed                      | Cu. m.    | 100  |  |  |  |
| 6                                                              | Concrete (4000 psi at 28 days) furnished and installed                      | Cu. m.    | 25   |  |  |  |
| 7                                                              | Reinforcing Bars furnished and installed (Grade-60)                         | kg        | 1000 |  |  |  |
| 8                                                              | Overhaul from Borrow and Compaction (regardless of the distance for borrow) | Cu. m.    | 100  |  |  |  |
| 9                                                              | Lean concrete furnished and installed (2000 psi strength at 28 days)        | Cu. m.    | 70   |  |  |  |
| 10                                                             | Compacted crush+sand (50:50 ratio) installed under footings                 | Cu. m.    | 50   |  |  |  |
| 11                                                             | Bitumen coating for footing                                                 | Sq. m     | 50   |  |  |  |
| 12                                                             | Compacted Backfill                                                          | Cu. m.    | 100  |  |  |  |
| 13                                                             | Steel Casing/Liner (steel sheet thickness- 8mm) Diameter 1250mm             | Lin. Mtrs | 75   |  |  |  |
| 15                                                             | Steel Casing/Liner (steel sheet thickness- 8mm) Diameter 1550mm             | Lin. Mtrs | 25   |  |  |  |
|                                                                | <b>Sub-Total I:</b>                                                         |           |      |  |  |  |
|                                                                |                                                                             |           |      |  |  |  |
|                                                                | <b>Total of Item A</b>                                                      |           |      |  |  |  |
|                                                                | <b>Total of Item B</b>                                                      |           |      |  |  |  |
|                                                                | <b>Total of Item C</b>                                                      |           |      |  |  |  |
|                                                                | <b>Total of Item D</b>                                                      |           |      |  |  |  |
|                                                                | <b>Total of Item E</b>                                                      |           |      |  |  |  |
|                                                                | <b>Total of Item F</b>                                                      |           |      |  |  |  |
|                                                                | <b>Total of Item G</b>                                                      |           |      |  |  |  |
|                                                                | <b>Total of Item H</b>                                                      |           |      |  |  |  |
|                                                                | <b>Total of Item I</b>                                                      |           |      |  |  |  |
| <b>Total (Column 6) to be carried forward to Grand Summary</b> |                                                                             |           |      |  |  |  |

**Notes:**

- 1 The quantities mentioned in the BOQ are estimated quantities. These quantities are to be used for bid evaluation purpose only. The actual quantities may vary depending upon detailed engineering and approved drawings. However, the unit rates for material and service quoted in the BOQ/ bid shall remain firm and final if design is unchanged.
- 2 Price of any other item specifically not covered in the Price Schedules but is required for the completion, commissioning and operation of the transmission line shall be deemed to be included in the Price Schedules.
- 3 In case of failure by the bidder to fill the price of Sales Tax in relevant column, the quoted price of the bidder will be considered inclusive of Sales Tax applicable as per Lax and relevant provisions of the Bidding Documents. In case the bidder takes deviation or mention that prices are exclusive of PST, his bid shall be considered as non-responsive.
- 4 Foundation means four legs of tower.
- 5 An allowance of two percent (2%) of the total installed quantity will be permitted for sag, jumpers and wastage for the conductor and shield wire, one percent (1%) for OPGW and two percent (2%) for lossage of nuts, bolts and washers (for towers only); and one percent (1%) for insulator breakage. These allowances are the maximum permissible and in case of wastage less than these limits all excess material shall be returned to NGC storage yards by the Contractor. For quantities in excess of these limits, the Contractor shall replace or reimburse NGC for the loss. All unused, above allowable limits of waste materials and packing wood are the property of NGC and shall be returned to NGC storage yards by the Contractor.
- 6 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.
- 7 The Bidder shall quote prices against all items, including those for which the specified quantity is "0". No item shall be left blank or unpriced in the Price Schedule.
- 8 Pile Foundation design will be release after the submission of Pile load test Report.
- 9 Location for Sonic Integrity and sonic integrity test report approval will be accorded by the office of DG (C&SE) NGC.

**Name of  
Bidder**

**Signature  
of Bidder**

| <b>Design, Manufacture, Procurement, Supply, Laying, Installation, Testing &amp; Commissioning of 500 kV<br/>Transmission Lines for C-5 Power Evacuation Scheme<br/>Lot-IX: 500 kV S/C C5-Ludewala —Section C (Approx. 29 km)</b> |                                                                                                  |                               |                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------|
| <b><u>SCHEDULE NO. 5 - GRAND SUMMARY</u></b>                                                                                                                                                                                      |                                                                                                  |                               |                                   |
| Sr.<br>No.                                                                                                                                                                                                                        | Description                                                                                      | Bid Prices                    |                                   |
|                                                                                                                                                                                                                                   |                                                                                                  | Foreign Currency<br>Component | Local Currency<br>Component (PKR) |
| 1                                                                                                                                                                                                                                 | Total Schedule No. 1 Plant and Mandatory Spare Parts Supplied from Abroad                        |                               |                                   |
| 2                                                                                                                                                                                                                                 | Total Schedule No. 2 Plant and Mandatory Spare Parts Supplied from Within the Employer's Country |                               |                                   |
| 3                                                                                                                                                                                                                                 | Total Schedule No. 3 Design Services                                                             |                               |                                   |
| 4                                                                                                                                                                                                                                 | Total Schedule No. 4 Installation and Other Services                                             |                               |                                   |
| 5                                                                                                                                                                                                                                 | Provisional Sum                                                                                  |                               | 1,115 Million                     |
| <b>GRAND TOTAL to be carried forward to Letter of Price Bid</b>                                                                                                                                                                   |                                                                                                  |                               |                                   |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

- 1 Specify the currency in accordance with ITB 12 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-IX: 500 kV S/C C5-Ludewala – Section C (Approx. 29 km)**

**Schedule No. 6 - Recommended Spare Parts**

| Item | Description    | Qty | Unit Price                              |                                                 | Total Price                  |                                |
|------|----------------|-----|-----------------------------------------|-------------------------------------------------|------------------------------|--------------------------------|
|      |                |     | EXW<br>Local Parts<br>Local<br>Currency | CIP<br>Imported<br>Parts<br>Foreign<br>Currency | Local<br>Currency<br>Portion | Foreign<br>Currency<br>Portion |
| 1    | 2              | 3   | 4                                       | 5                                               | 6 = 3 x 4                    | 7 = 3 x 5                      |
|      | NOT APPLICABLE |     |                                         |                                                 |                              |                                |
|      |                |     |                                         |                                                 |                              |                                |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

# **Schedules of Rates and Prices**

## **(LOT-X)**

| Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme |                                                                                                                                                                                                                                                                                                  |                  |                            |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------|------------------------|------|----------|-----------------------------------|-----------|------------------------------------|-----------|-----------------------------|--------------------------------|----------|----------------|
| Lot-X: 500 kV S/C C5-Ludewala —Section D (Approx. 32 km)                                                                                             |                                                                                                                                                                                                                                                                                                  |                  |                            |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| SCHEDULE NO.1- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM ABROAD                                                                                  |                                                                                                                                                                                                                                                                                                  |                  |                            |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| Item No.                                                                                                                                             | Description                                                                                                                                                                                                                                                                                      |                  |                            | Code Country of Origin | Unit | Quantity | Unit Price (CIF Pakistan Seaport) |           | Total Price (CIF Pakistan Seaport) |           | Total Inland Transportation | Total Price CIP (Project Site) |          | Taxes & Duties |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  |                  |                            |                        |      |          | CFR                               | Insurance | CFR                                | Insurance |                             | FCC                            | LCC      | Local Currency |
| 1                                                                                                                                                    | 2                                                                                                                                                                                                                                                                                                |                  |                            | 3                      | 4    | 5        | 6                                 | 7         | 8=5 x 6                            | 9 = 5 x 7 | 10                          | 11=8                           | 12= 9+10 | 13             |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  |                  |                            |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      | 500kV Single Circuit Transmission Line                                                                                                                                                                                                                                                           |                  |                            |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| A                                                                                                                                                    | Steel Towers                                                                                                                                                                                                                                                                                     |                  |                            |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
| 1                                                                                                                                                    | Furnish 500kV Single circuit towers SGM, AGM ,DGM & TGM including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                  |                            |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      | (a)                                                                                                                                                                                                                                                                                              | Tower Type "SGM" |                            |                        |      |          |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (i)              | Basic Tower Body           |                        | No.  | 79       |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (ii)             | 1.5 m Single Leg Extension |                        | No.  | -        |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (iii)            | 3.0 m Single Leg Extension |                        | No.  | 64       |                                   |           |                                    |           |                             |                                |          |                |
|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                  | (iv)             | 4.5 m Single Leg Extension |                        | No.  | 124      |                                   |           |                                    |           |                             |                                |          |                |

|     |                         |                            |     |     |  |  |  |  |  |  |  |  |  |
|-----|-------------------------|----------------------------|-----|-----|--|--|--|--|--|--|--|--|--|
|     | (v)                     | 6.0 m Single Leg Extension | No. | 128 |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 4.5 m Body Extension       | No. | 16  |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | 9.0 m Body Extension       | No. | 10  |  |  |  |  |  |  |  |  |  |
|     | (viii)                  | Stubs                      | No. | 316 |  |  |  |  |  |  |  |  |  |
| (b) | <u>Tower Type "AGM"</u> |                            |     |     |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 14  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 1.5 m Single Leg Extension | No. | -   |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 3.0 m Single Leg Extension | No. | 12  |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 4.5 m Single Leg Extension | No. | 20  |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 6.0 m Single Leg Extension | No. | 24  |  |  |  |  |  |  |  |  |  |
|     | (vi)                    | 4.5 m Body Extension       | No. | 3   |  |  |  |  |  |  |  |  |  |
|     | (vii)                   | 9.0 m Body Extension       | No. | 3   |  |  |  |  |  |  |  |  |  |
|     | (viii)                  | Stubs                      | No. | 56  |  |  |  |  |  |  |  |  |  |
| (c) | <u>Tower Type "DGM"</u> |                            |     |     |  |  |  |  |  |  |  |  |  |
|     | (i)                     | Basic Tower Body           | No. | 19  |  |  |  |  |  |  |  |  |  |
|     | (ii)                    | 1.5 m Single Leg Extension | No. | -   |  |  |  |  |  |  |  |  |  |
|     | (iii)                   | 3.0 m Single Leg Extension | No. | 16  |  |  |  |  |  |  |  |  |  |
|     | (iv)                    | 4.5 m Single Leg Extension | No. | 28  |  |  |  |  |  |  |  |  |  |
|     | (v)                     | 6.0 m Single Leg Extension | No. | 32  |  |  |  |  |  |  |  |  |  |



|               |                                                              |                                                    |     |     |  |  |  |  |  |  |  |  |  |
|---------------|--------------------------------------------------------------|----------------------------------------------------|-----|-----|--|--|--|--|--|--|--|--|--|
|               | (vi)                                                         | 4.5 m Body Extension                               | No. | 3   |  |  |  |  |  |  |  |  |  |
|               | (vii)                                                        | 9.0 m Body Extension                               | No. | 4   |  |  |  |  |  |  |  |  |  |
|               | (viii)                                                       | Stubs                                              | No. | 76  |  |  |  |  |  |  |  |  |  |
| (d)           | Tower Type "TGM"                                             |                                                    |     |     |  |  |  |  |  |  |  |  |  |
|               | (i)                                                          | Basic Tower Body                                   | No. | 2   |  |  |  |  |  |  |  |  |  |
|               | (ii)                                                         | 8.0 m Single Leg Extension                         | No. | 8   |  |  |  |  |  |  |  |  |  |
|               | (iii)                                                        | Stubs                                              | No. | 8   |  |  |  |  |  |  |  |  |  |
| Sub-Total A : |                                                              |                                                    |     |     |  |  |  |  |  |  |  |  |  |
| <b>B</b>      | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                                                    |     |     |  |  |  |  |  |  |  |  |  |
| 1             | Furnish 795 KCM ACSR "Drake" Conductor                       |                                                    | km  | 390 |  |  |  |  |  |  |  |  |  |
| 2             | Furnish                                                      |                                                    |     |     |  |  |  |  |  |  |  |  |  |
|               | (a)                                                          | OPGW with at least 24 fibers                       | km  | 40  |  |  |  |  |  |  |  |  |  |
|               | (b)                                                          | Joint boxes for OPGW                               |     |     |  |  |  |  |  |  |  |  |  |
|               | (i)                                                          | OPGW-OPGW (A Type)                                 | No. | 8   |  |  |  |  |  |  |  |  |  |
|               | (ii)                                                         | OPGW-OPGW Cable ( B Type)                          | No. | 2   |  |  |  |  |  |  |  |  |  |
|               | (iii)                                                        | OPGW-attaching Clamps                              | No. | 600 |  |  |  |  |  |  |  |  |  |
|               | (iv)                                                         | Fibre Optic Approach Cable                         | km  | 3   |  |  |  |  |  |  |  |  |  |
|               | (c)                                                          | Test Equipment, Installation and Maintenance Tools |     | -   |  |  |  |  |  |  |  |  |  |
|               | -                                                            | Fiber Optic Talk Set (Set comprised two units)     | Set | 1   |  |  |  |  |  |  |  |  |  |
|               | -                                                            | Fiber Optic Tool Kit                               | Set | 1   |  |  |  |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                          |   |                                                                |  |     |       |  |  |  |  |  |  |  |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----------------------------------------------------------------|--|-----|-------|--|--|--|--|--|--|--|
|          |                                                                                                                                                                                                                                                          | - | OTDR with range $\geq 400$ km<br>Yokogawa AQ7260 or equivalent |  | Set | 1     |  |  |  |  |  |  |  |
| 3        | Furnish 9.15 mm dia EHS Shieldwire                                                                                                                                                                                                                       |   |                                                                |  | km  | 35.20 |  |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                          |   |                                                                |  |     |       |  |  |  |  |  |  |  |
|          | <b>Sub Total B :</b>                                                                                                                                                                                                                                     |   |                                                                |  |     |       |  |  |  |  |  |  |  |
| <b>C</b> | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                             |   |                                                                |  |     |       |  |  |  |  |  |  |  |
| 1        | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit towers type 'SGM' & 'TGM' as per specification drawing No. NTDC/DESIGN/01E151    |   |                                                                |  | Set | 243   |  |  |  |  |  |  |  |
| 2        | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. NTDC/DESIGN/01E153      |   |                                                                |  | Set | 33    |  |  |  |  |  |  |  |
| 3        | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004 |   |                                                                |  | Set | 66    |  |  |  |  |  |  |  |
| 4        | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower types 'AGM' & 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005            |   |                                                                |  | Set | 198   |  |  |  |  |  |  |  |
| 5        | Furnish Transposition Assembly Type IT(4) for tower type 'TGM' including 25x1 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators                                                                                                                         |   |                                                                |  | Set | 4     |  |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                     |         |    |  |  |  |  |  |  |  |  |  |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----|--|--|--|--|--|--|--|--|--|
|          | (Porcelain or Glass)* as per specification drawing No. NTDC/DESIGN/01E152                                                                                                                                                           |         |    |  |  |  |  |  |  |  |  |  |
| 6        | Furnish Double String Dead End Assemblies "DSD1(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010  | Set     | 3  |  |  |  |  |  |  |  |  |  |
| 7        | Furnish Double String Dead End Assemblies "DSD2(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011 | Set     | 3  |  |  |  |  |  |  |  |  |  |
| 8        | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assemblies (items C1 - C7) with Coulomb or ElecNET software.                                                               | Lumpsum | 1  |  |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total C :</b>                                                                                                                                                                                                                |         |    |  |  |  |  |  |  |  |  |  |
| <b>D</b> | <b>Hardware for OPGW &amp; Shieldwire</b>                                                                                                                                                                                           |         |    |  |  |  |  |  |  |  |  |  |
| 1        | Furnish Suspension Assembly for OPGW including AGS clamp for single circuit tower type 'SGM' & 'TGM' as per specification                                                                                                           | Set     | 81 |  |  |  |  |  |  |  |  |  |
| 2        | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification                                                                                                                                            | Set     | 8  |  |  |  |  |  |  |  |  |  |
| 3        | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification                                                                                                                               | Set     | 33 |  |  |  |  |  |  |  |  |  |
| 4        | Overhead shield wire suspension assembly for tower type 'SGM' & 'TGM' as per specification drawing                                                                                                                                  | Set     | 81 |  |  |  |  |  |  |  |  |  |
| 5        | Overhead shieldwire dead end assembly for tower type 'AGM' & 'DGM' as per specification drawing                                                                                                                                     | Set     | 66 |  |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total D :</b>                                                                                                                                                                                                                |         |    |  |  |  |  |  |  |  |  |  |

|          |                                                                                                                                                                          |  |       |       |  |  |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------|-------|--|--|--|--|--|--|--|--|
| <b>E</b> | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |  |       |       |  |  |  |  |  |  |  |  |
| 1        | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 |  | No.   | 134   |  |  |  |  |  |  |  |  |
| 2        | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      |  | No.   | 67    |  |  |  |  |  |  |  |  |
| 3        | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. |  | No.   | 898   |  |  |  |  |  |  |  |  |
| 4        | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                |  | No.   | 2,488 |  |  |  |  |  |  |  |  |
| 5        | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor (See Note-3)                                                                                  |  | No.   | 622   |  |  |  |  |  |  |  |  |
| 6        | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         |  | No.   | 307   |  |  |  |  |  |  |  |  |
| 7        | Furnish stock bridge vibration dampers for Shield Wire.                                                                                                                  |  | No.   | 307   |  |  |  |  |  |  |  |  |
| 8        | Compression splice for 9.15mm dia EHS Shield Wire                                                                                                                        |  | No.   | 11    |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total E :</b>                                                                                                                                                     |  |       |       |  |  |  |  |  |  |  |  |
|          |                                                                                                                                                                          |  |       |       |  |  |  |  |  |  |  |  |
| <b>F</b> | <b><u>Grounding Material</u></b>                                                                                                                                         |  |       |       |  |  |  |  |  |  |  |  |
| 1        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            |  | No.   | 228   |  |  |  |  |  |  |  |  |
| 2        | Furnish flat to cable connector.                                                                                                                                         |  | No.   | 228   |  |  |  |  |  |  |  |  |
| 3        | Furnish cable to rod connector.                                                                                                                                          |  | No.   | 228   |  |  |  |  |  |  |  |  |
| 4        | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             |  | Meter | 684   |  |  |  |  |  |  |  |  |
|          | <b>Sub-Total F :</b>                                                                                                                                                     |  |       |       |  |  |  |  |  |  |  |  |
| <b>G</b> | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                      |  |       |       |  |  |  |  |  |  |  |  |
| <b>1</b> | <b><u>Steel Towers</u></b>                                                                                                                                               |  |       |       |  |  |  |  |  |  |  |  |

|                                                                                                                                                                                                                                                                                                  |                  |                            |  |     |    |  |  |  |  |  |  |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------|--|-----|----|--|--|--|--|--|--|--|--|
| Furnish 500kV Single circuit towers SGM, AGM ,DGM & TGM including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |                  |                            |  |     |    |  |  |  |  |  |  |  |  |
| (a)                                                                                                                                                                                                                                                                                              | Tower Type "SGM" |                            |  |     |    |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                  | (i)              | Basic Tower Body           |  | No. | 8  |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                  | (ii)             | 1.5 m Single Leg Extension |  | No. | 4  |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                  | (iii)            | 3.0 m Single Leg Extension |  | No. | 12 |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                  | (iv)             | 4.5 m Single Leg Extension |  | No. | 12 |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                  | (v)              | 6.0 m Single Leg Extension |  | No. | 12 |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                  | (vi)             | 4.5 m Body Extension       |  | No. | 2  |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                  | (vii)            | 9.0 m Body Extension       |  | No. | 2  |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                  | (viii)           | Stubs                      |  | No. | 32 |  |  |  |  |  |  |  |  |
| (b)                                                                                                                                                                                                                                                                                              | Tower Type "AGM" |                            |  |     |    |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                  | (i)              | Basic Tower Body           |  | No. | 3  |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                  | (ii)             | 1.5 m Single Leg Extension |  | No. | 4  |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                  | (iii)            | 3.0 m Single Leg Extension |  | No. | 4  |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                  | (iv)             | 4.5 m Single Leg Extension |  | No. | 8  |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                  | (v)              | 6.0 m Single Leg Extension |  | No. | 8  |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                  | (vi)             | 4.5 m Body Extension       |  | No. | 2  |  |  |  |  |  |  |  |  |

|     |                                                              |                              |     |       |  |  |  |  |  |  |  |  |  |
|-----|--------------------------------------------------------------|------------------------------|-----|-------|--|--|--|--|--|--|--|--|--|
|     | (vii)                                                        | 9.0 m Body Extension         | No. | 2     |  |  |  |  |  |  |  |  |  |
|     | (viii)                                                       | Stubs                        | No. | 12    |  |  |  |  |  |  |  |  |  |
| (c) | <u>Tower Type "DGM"</u>                                      |                              |     |       |  |  |  |  |  |  |  |  |  |
|     | (i)                                                          | Basic Tower Body             | No. | 3     |  |  |  |  |  |  |  |  |  |
|     | (ii)                                                         | 1.5 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|     | (iii)                                                        | 3.0 m Single Leg Extension   | No. | 4     |  |  |  |  |  |  |  |  |  |
|     | (iv)                                                         | 4.5 m Single Leg Extension   | No. | 8     |  |  |  |  |  |  |  |  |  |
|     | (v)                                                          | 6.0 m Single Leg Extension   | No. | 8     |  |  |  |  |  |  |  |  |  |
|     | (vi)                                                         | 4.5 m Body Extension         | No. | 2     |  |  |  |  |  |  |  |  |  |
|     | (vii)                                                        | 9.0 m Body Extension         | No. | 2     |  |  |  |  |  |  |  |  |  |
|     | (viii)                                                       | Stubs                        | No. | 12    |  |  |  |  |  |  |  |  |  |
| (d) | <u>Tower Type "TGM"</u>                                      |                              |     |       |  |  |  |  |  |  |  |  |  |
|     | (i)                                                          | Basic Tower Body             | No. | -     |  |  |  |  |  |  |  |  |  |
|     | (ii)                                                         | 6.0 m Single Leg Extension   | No. | -     |  |  |  |  |  |  |  |  |  |
|     | (iii)                                                        | Stubs                        | No. | -     |  |  |  |  |  |  |  |  |  |
|     | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                              |     |       |  |  |  |  |  |  |  |  |  |
| 2   | Furnish 795 KCM ACSR "Drake" Conductor                       |                              | km  | 38.40 |  |  |  |  |  |  |  |  |  |
| 3   | Furnish                                                      |                              |     |       |  |  |  |  |  |  |  |  |  |
|     | (a)                                                          | OPGW with at least 24 fibers | km  | 5     |  |  |  |  |  |  |  |  |  |
|     | (b)                                                          | Joint boxes for OPGW         |     |       |  |  |  |  |  |  |  |  |  |

|   |       |                                                                                                                                                                                                                                                          |     |      |  |  |  |  |  |  |  |  |  |
|---|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|--|--|--|--|--|--|--|--|--|
|   | (i)   | OPGW-OPGW (A Type)                                                                                                                                                                                                                                       | No. | 1    |  |  |  |  |  |  |  |  |  |
|   | (ii)  | OPGW-OPGW Cable ( B Type)                                                                                                                                                                                                                                | No. | 0    |  |  |  |  |  |  |  |  |  |
|   | (iii) | OPGW-attaching Clamps                                                                                                                                                                                                                                    | No. | 60   |  |  |  |  |  |  |  |  |  |
|   | (iv)  | Fibre Optic Approach Cable                                                                                                                                                                                                                               | km  | -    |  |  |  |  |  |  |  |  |  |
|   | (c)   | Test Equipment, Installation and Maintenance Tools                                                                                                                                                                                                       |     | -    |  |  |  |  |  |  |  |  |  |
|   | -     | Fiber Optic Talk Set (Set comprised two units)                                                                                                                                                                                                           | Set | -    |  |  |  |  |  |  |  |  |  |
|   | -     | Fiber Optic Tool Kit                                                                                                                                                                                                                                     | Set | -    |  |  |  |  |  |  |  |  |  |
|   | -     | OTDR with range $\geq 400\text{km}$ Yokogawa AQ7260 or equivalent                                                                                                                                                                                        | Set | -    |  |  |  |  |  |  |  |  |  |
| 4 |       | Furnish 9.15 mm dia EHS Shieldwire                                                                                                                                                                                                                       | km  | 6.40 |  |  |  |  |  |  |  |  |  |
|   |       | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                             |     |      |  |  |  |  |  |  |  |  |  |
| 5 |       | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'SGM' as per specification drawing No. NTDC/DESIGN/01E151             | Set | 24   |  |  |  |  |  |  |  |  |  |
| 6 |       | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. NTDC/DESIGN/01E153      | Set | 6    |  |  |  |  |  |  |  |  |  |
| 7 |       | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004 | Set | 12   |  |  |  |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                               |  |     |    |  |  |  |  |  |  |  |  |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|----|--|--|--|--|--|--|--|--|
| 8  | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower types 'AGM' & 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005 |  | Set | 36 |  |  |  |  |  |  |  |  |
| 9  | Furnish Transposition Assembly Type IT(4) for tower type 'TGM' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. NTDC/DESIGN/01E152                                    |  | Set | -  |  |  |  |  |  |  |  |  |
| 10 | Furnish Double String Dead End Assemblies "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010            |  | Set | 3  |  |  |  |  |  |  |  |  |
| 11 | Furnish Double String Dead End Assemblies "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011           |  | Set | 3  |  |  |  |  |  |  |  |  |
|    | <b><u>Hardware for OPGW &amp; Shieldwire</u></b>                                                                                                                                                                                              |  |     |    |  |  |  |  |  |  |  |  |
| 12 | Furnish Suspension Assembly for OPGW including AGS clamp for single circuit tower type 'SGM' & 'TGM' as per specification                                                                                                                     |  | Set | 8  |  |  |  |  |  |  |  |  |
| 13 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification                                                                                                                                                      |  | Set | 1  |  |  |  |  |  |  |  |  |
| 14 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification                                                                                                                                         |  | Set | 6  |  |  |  |  |  |  |  |  |
| 15 | Overhead shield wire suspension assembly for tower type 'SGM' & 'TGM' as per specification drawing                                                                                                                                            |  | Set | 8  |  |  |  |  |  |  |  |  |



|    |                                                                                                                                                                          |       |     |  |  |  |  |  |  |  |   |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|--|--|--|--|--|--|--|---|
| 16 | Overhead shieldwire dead end assembly for tower type 'AGM' & 'DGM' as per specification drawing                                                                          | Set   | 12  |  |  |  |  |  |  |  |   |
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |       |     |  |  |  |  |  |  |  |   |
| 17 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 | No.   | 13  |  |  |  |  |  |  |  |   |
| 18 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      | No.   | 7   |  |  |  |  |  |  |  |   |
| 19 | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No.   | 185 |  |  |  |  |  |  |  |   |
| 20 | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No.   | 331 |  |  |  |  |  |  |  |   |
| 21 | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor                                                                                               | No.   | 83  |  |  |  |  |  |  |  |   |
| 22 | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No.   | 42  |  |  |  |  |  |  |  |   |
| 23 | Furnish stock bridge vibration dampers for Shield Wire.                                                                                                                  | No.   | 42  |  |  |  |  |  |  |  |   |
| 24 | Compression splice for 9.15 mm dia EHS Shield Wire                                                                                                                       | No.   | 2   |  |  |  |  |  |  |  |   |
|    | <b><u>Grounding Material</u></b>                                                                                                                                         |       |     |  |  |  |  |  |  |  |   |
| 25 | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            | No.   | 28  |  |  |  |  |  |  |  |   |
| 26 | Furnish flat to cable connector.                                                                                                                                         | No.   | 28  |  |  |  |  |  |  |  |   |
| 27 | Furnish cable to rod connector.                                                                                                                                          | No.   | 28  |  |  |  |  |  |  |  |   |
| 28 | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             | Meter | 84  |  |  |  |  |  |  |  |   |
|    | <b>Sub-Total of G :</b>                                                                                                                                                  |       |     |  |  |  |  |  |  |  | - |
|    | <b>Total of Item A</b>                                                                                                                                                   |       |     |  |  |  |  |  |  |  | - |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                 |  |  |  |  |  |  |  |   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--|--|--|--|--|--|--|---|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Total of Item B |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Total of Item C |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Total of Item D |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Total of Item E |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Total of Item F |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Total of Item G |  |  |  |  |  |  |  | - |
| <b>Grand Total of column No. 11 &amp; 12 to be carried forward to Grand summary</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                 |  |  |  |  |  |  |  | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                 |  |  |  |  |  |  |  |   |
| <p>* The Bidder shall specify the type of insulator being offered.</p> <p><b>Notes:</b></p> <p>1 Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types SGM, AGM, DGM, and TGM, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly.</p> <p>2 The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.</p> <p>3 The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.</p> <p>4 The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.</p> <p>5 The bidder shall be responsible to furnish the tower material, OPGW, Shield Wire, conductor, insulators, accessories, dampers &amp; hardware for conductor and OPGW, for completion of line in all respect. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.</p> <p>6 The contractor shall transport, unload and stack leftover/additional material from site to NTDC designated Warehouse/Store at its own cost.</p> <p>7 Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.</p> |                 |  |  |  |  |  |  |  |   |

- 8 The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully before filling up the schedule of prices.
- 9 Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.
- 10 Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.
- 11 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.

**Signature  
of Bidder**

| Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme<br>Lot-X: 500 kV S/C C5-Ludewala —Section D (Approx. 32 km) |                                                                                                                                                                                                                                                                                                  |      |          |                |           |                 |                             |                               |                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------|----------------|-----------|-----------------|-----------------------------|-------------------------------|--------------------------------------|
| <b>SCHEDULE NO.2- PLANT AND MANDATORY SPARE PARTS SUPPLIED FROM WITHIN PAKISTAN</b>                                                                                                                              |                                                                                                                                                                                                                                                                                                  |      |          |                |           |                 |                             |                               |                                      |
| Item No.                                                                                                                                                                                                         | Description                                                                                                                                                                                                                                                                                      | Unit | Quantity | Unit Price     |           | Total EXW Price | Total Inland Transportation | Total Price<br>Local Currency | Sales and other Taxes & Duties (PKR) |
|                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                  |      |          | Local Currency | EXW Price |                 |                             |                               |                                      |
| 1                                                                                                                                                                                                                | 2                                                                                                                                                                                                                                                                                                | 3    | 4        | 5              | 6         | 7 = 4 x 6       | 8                           | 9 = 7+ 8                      | 10                                   |
|                                                                                                                                                                                                                  | <b>500kV Single Circuit Transmission Line</b>                                                                                                                                                                                                                                                    |      |          |                |           |                 |                             |                               |                                      |
| <b>A</b>                                                                                                                                                                                                         | <b>Steel Towers</b>                                                                                                                                                                                                                                                                              |      |          |                |           |                 |                             |                               |                                      |
| 1                                                                                                                                                                                                                | Furnish 500kV Single circuit towers SGM, AGM ,DGM & TGM including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |      |          |                |           |                 |                             |                               |                                      |
|                                                                                                                                                                                                                  | (a) <b>Tower Type "SGM"</b>                                                                                                                                                                                                                                                                      |      |          |                |           |                 |                             |                               |                                      |
|                                                                                                                                                                                                                  | (i) Basic Tower Body                                                                                                                                                                                                                                                                             | No.  | 79       |                |           |                 |                             |                               |                                      |
|                                                                                                                                                                                                                  | (ii) 1.5 m Single Leg Extension                                                                                                                                                                                                                                                                  | No.  | -        |                |           |                 |                             |                               |                                      |
|                                                                                                                                                                                                                  | (iii) 3.0 m Single Leg Extension                                                                                                                                                                                                                                                                 | No.  | 64       |                |           |                 |                             |                               |                                      |
|                                                                                                                                                                                                                  | (iv) 4.5 m Single Leg Extension                                                                                                                                                                                                                                                                  | No.  | 124      |                |           |                 |                             |                               |                                      |
|                                                                                                                                                                                                                  | (v) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                   | No.  | 128      |                |           |                 |                             |                               |                                      |
|                                                                                                                                                                                                                  | (vi) 4.5 m Body Extension                                                                                                                                                                                                                                                                        | No.  | 16       |                |           |                 |                             |                               |                                      |
|                                                                                                                                                                                                                  | (vii) 9.0 m Body Extension                                                                                                                                                                                                                                                                       | No.  | 10       |                |           |                 |                             |                               |                                      |
|                                                                                                                                                                                                                  | (viii) Stubs                                                                                                                                                                                                                                                                                     | No.  | 316      |                |           |                 |                             |                               |                                      |
|                                                                                                                                                                                                                  | (b) <b>Tower Type "AGM"</b>                                                                                                                                                                                                                                                                      |      |          |                |           |                 |                             |                               |                                      |

|          |                                                              |                              |     |     |  |  |  |  |  |  |
|----------|--------------------------------------------------------------|------------------------------|-----|-----|--|--|--|--|--|--|
|          | (i)                                                          | Basic Tower Body             | No. | 14  |  |  |  |  |  |  |
|          | (ii)                                                         | 1.5 m Single Leg Extension   | No. | -   |  |  |  |  |  |  |
|          | (iii)                                                        | 3.0 m Single Leg Extension   | No. | 12  |  |  |  |  |  |  |
|          | (iv)                                                         | 4.5 m Single Leg Extension   | No. | 20  |  |  |  |  |  |  |
|          | (v)                                                          | 6.0 m Single Leg Extension   | No. | 24  |  |  |  |  |  |  |
|          | (vi)                                                         | 4.5 m Body Extension         | No. | 3   |  |  |  |  |  |  |
|          | (vii)                                                        | 9.0 m Body Extension         | No. | 3   |  |  |  |  |  |  |
|          | (viii)                                                       | Stubs                        | No. | 56  |  |  |  |  |  |  |
| (c)      | <u>Tower Type "DGM"</u>                                      |                              |     |     |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body             | No. | 19  |  |  |  |  |  |  |
|          | (ii)                                                         | 1.5 m Single Leg Extension   | No. | -   |  |  |  |  |  |  |
|          | (iii)                                                        | 3.0 m Single Leg Extension   | No. | 16  |  |  |  |  |  |  |
|          | (iv)                                                         | 4.5 m Single Leg Extension   | No. | 28  |  |  |  |  |  |  |
|          | (v)                                                          | 6.0 m Single Leg Extension   | No. | 32  |  |  |  |  |  |  |
|          | (vi)                                                         | 4.5 m Body Extension         | No. | 3   |  |  |  |  |  |  |
|          | (vii)                                                        | 9.0 m Body Extension         | No. | 4   |  |  |  |  |  |  |
|          | (viii)                                                       | Stubs                        | No. | 76  |  |  |  |  |  |  |
| (d)      | <u>Tower Type "TGM"</u>                                      |                              |     |     |  |  |  |  |  |  |
|          | (i)                                                          | Basic Tower Body             | No. | 2   |  |  |  |  |  |  |
|          | (ii)                                                         | 8.0 m Single Leg Extension   | No. | 8   |  |  |  |  |  |  |
|          | (iii)                                                        | Stubs                        | No. | 8   |  |  |  |  |  |  |
|          | <b>Sub-Total A :</b>                                         |                              |     |     |  |  |  |  |  |  |
| <b>B</b> | <b><u>Conductor and OPGW (With Associated Equipment)</u></b> |                              |     |     |  |  |  |  |  |  |
| 1        | Furnish 795 KCM ACSR "Drake" Conductor                       |                              | km  | 390 |  |  |  |  |  |  |
| 2        | Furnish                                                      |                              |     |     |  |  |  |  |  |  |
|          | (a)                                                          | OPGW with at least 24 fibers | km  | 40  |  |  |  |  |  |  |
|          | (b)                                                          | Joint boxes for OPGW         |     |     |  |  |  |  |  |  |

|          |                                                                                                                                                                                                                                                          |                                                             |     |       |  |  |  |  |  |  |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-----|-------|--|--|--|--|--|--|
|          | (i)                                                                                                                                                                                                                                                      | OPGW-OPGW (A Type)                                          | No. | 8     |  |  |  |  |  |  |
|          | (ii)                                                                                                                                                                                                                                                     | OPGW-OPGW Cable ( B Type)                                   | No. | 2     |  |  |  |  |  |  |
|          | (iii)                                                                                                                                                                                                                                                    | OPGW-attaching Clamps                                       | No. | 600   |  |  |  |  |  |  |
|          | (iv)                                                                                                                                                                                                                                                     | Fibre Optic Approach Cable                                  | km  | 3     |  |  |  |  |  |  |
|          | (c)                                                                                                                                                                                                                                                      | Test Equipment, Installation and Maintenance Tools          |     | -     |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                        | Fiber Optic Talk Set (Set comprised two units)              | Set | 1     |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                        | Fiber Optic Tool Kit                                        | Set | 1     |  |  |  |  |  |  |
|          | -                                                                                                                                                                                                                                                        | OTDR with range $\geq 400$ km Yokogawa AQ7260 or equivalent | Set | 1     |  |  |  |  |  |  |
| 3        |                                                                                                                                                                                                                                                          | Furnish 9.15 mm dia EHS Shieldwire                          | km  | 35.20 |  |  |  |  |  |  |
|          |                                                                                                                                                                                                                                                          |                                                             |     |       |  |  |  |  |  |  |
|          | <b>Sub Total B :</b>                                                                                                                                                                                                                                     |                                                             |     |       |  |  |  |  |  |  |
| <b>C</b> | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                             |                                                             |     |       |  |  |  |  |  |  |
| 1        | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit towers type 'SGM' & 'TGM' as per specification drawing No. NTDC/DESIGN/01E151    |                                                             | Set | 243   |  |  |  |  |  |  |
| 2        | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. NTDC/DESIGN/01E153      |                                                             | Set | 33    |  |  |  |  |  |  |
| 3        | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004 |                                                             | Set | 66    |  |  |  |  |  |  |

|                      |                                                                                                                                                                                                                                               |         |     |  |  |  |  |  |  |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|--|--|--|--|--|--|
| 4                    | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower types 'AGM' & 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005 | Set     | 198 |  |  |  |  |  |  |
| 5                    | Furnish Transposition Assembly Type IT(4) for tower type 'TGM' including 25x1 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. NTDC/DESIGN/01E152                                    | Set     | 4   |  |  |  |  |  |  |
| 6                    | Furnish Double String Dead End Assemblies "DSD1(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010            | Set     | 3   |  |  |  |  |  |  |
| 7                    | Furnish Double String Dead End Assemblies "DSD2(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011           | Set     | 3   |  |  |  |  |  |  |
| 8                    | Submit Finite Element (FEM) Simulation for Electric Field (Potential) Distribution of Insulator Hardware Assemblies (items C1 - C7) with Coulomb or ElecNET software.                                                                         | Lumpsum | 1   |  |  |  |  |  |  |
| <b>Sub-Total C :</b> |                                                                                                                                                                                                                                               |         |     |  |  |  |  |  |  |
| <b>D</b>             | <b><u>Hardware for OPGW &amp; Shieldwire</u></b>                                                                                                                                                                                              |         |     |  |  |  |  |  |  |
| 1                    | Furnish Suspension Assembly for OPGW including AGS clamp for single circuit tower type 'SGM' & 'TGM' as per specification                                                                                                                     | Set     | 81  |  |  |  |  |  |  |
| 2                    | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification                                                                                                                                                      | Set     | 8   |  |  |  |  |  |  |
| 3                    | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification                                                                                                                                         | Set     | 33  |  |  |  |  |  |  |
| 4                    | Overhead shield wire suspension assembly for tower type 'SGM' & 'TGM' as per specification drawing                                                                                                                                            | Set     | 81  |  |  |  |  |  |  |

|          |                                                                                                                                                                          |       |       |  |  |  |  |  |  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|--|--|--|--|--|--|
| 5        | Overhead shieldwire dead end assembly for tower type 'AGM' & 'DGM' as per specification drawing                                                                          | Set   | 66    |  |  |  |  |  |  |
|          | <b>Sub-Total D :</b>                                                                                                                                                     |       |       |  |  |  |  |  |  |
| <b>E</b> | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |       |       |  |  |  |  |  |  |
| 1        | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 | No.   | 134   |  |  |  |  |  |  |
| 2        | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      | No.   | 67    |  |  |  |  |  |  |
| 3        | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No.   | 898   |  |  |  |  |  |  |
| 4        | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No.   | 2,488 |  |  |  |  |  |  |
| 5        | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor (See Note-3)                                                                                  | No.   | 622   |  |  |  |  |  |  |
| 6        | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No.   | 307   |  |  |  |  |  |  |
| 7        | Furnish stock bridge vibration dampers for Shield Wire.                                                                                                                  | No.   | 307   |  |  |  |  |  |  |
| 8        | Compression splice for 9.15mm dia EHS Shield Wire                                                                                                                        | No.   | 11    |  |  |  |  |  |  |
|          | <b>Sub-Total E :</b>                                                                                                                                                     |       |       |  |  |  |  |  |  |
|          |                                                                                                                                                                          |       |       |  |  |  |  |  |  |
| <b>F</b> | <b><u>Grounding Material</u></b>                                                                                                                                         |       |       |  |  |  |  |  |  |
| 1        | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            | No.   | 228   |  |  |  |  |  |  |
| 2        | Furnish flat to cable connector.                                                                                                                                         | No.   | 228   |  |  |  |  |  |  |
| 3        | Furnish cable to rod connector.                                                                                                                                          | No.   | 228   |  |  |  |  |  |  |
| 4        | Furnish 7 No. 10 copper covered ground wire.                                                                                                                             | Meter | 684   |  |  |  |  |  |  |
|          | <b>Sub-Total F :</b>                                                                                                                                                     |       |       |  |  |  |  |  |  |
| <b>G</b> | <b><u>Mandatory Spare Parts</u></b>                                                                                                                                      |       |       |  |  |  |  |  |  |
| <b>1</b> | <b><u>Steel Towers</u></b>                                                                                                                                               |       |       |  |  |  |  |  |  |



|  |     |                                                                                                                                                                                                                                                                                                  |     |    |  |  |  |  |  |  |
|--|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|--|--|--|--|--|--|
|  |     | Furnish 500kV Single circuit towers SGM, AGM ,DGM & TGM including anti-theft bolts, anti-climbing devices, number plates, danger signs, phase plates, aerial marker plates and Bird Guards (See Note-1&2) and in accordance with requirements of Technical Provisions/Specifications & Drawings. |     |    |  |  |  |  |  |  |
|  | (a) | <u>Tower Type "SGM"</u>                                                                                                                                                                                                                                                                          |     |    |  |  |  |  |  |  |
|  |     | (i) Basic Tower Body                                                                                                                                                                                                                                                                             | No. | 8  |  |  |  |  |  |  |
|  |     | (ii) 1.5 m Single Leg Extension                                                                                                                                                                                                                                                                  | No. | 4  |  |  |  |  |  |  |
|  |     | (iii) 3.0 m Single Leg Extension                                                                                                                                                                                                                                                                 | No. | 12 |  |  |  |  |  |  |
|  |     | (iv) 4.5 m Single Leg Extension                                                                                                                                                                                                                                                                  | No. | 12 |  |  |  |  |  |  |
|  |     | (v) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                   | No. | 12 |  |  |  |  |  |  |
|  |     | (vi) 4.5 m Body Extension                                                                                                                                                                                                                                                                        | No. | 2  |  |  |  |  |  |  |
|  |     | (vii) 9.0 m Body Extension                                                                                                                                                                                                                                                                       | No. | 2  |  |  |  |  |  |  |
|  |     | (viii) Stubs                                                                                                                                                                                                                                                                                     | No. | 32 |  |  |  |  |  |  |
|  | (b) | <u>Tower Type "AGM"</u>                                                                                                                                                                                                                                                                          |     |    |  |  |  |  |  |  |
|  |     | (i) Basic Tower Body                                                                                                                                                                                                                                                                             | No. | 3  |  |  |  |  |  |  |
|  |     | (ii) 1.5 m Single Leg Extension                                                                                                                                                                                                                                                                  | No. | 4  |  |  |  |  |  |  |
|  |     | (iii) 3.0 m Single Leg Extension                                                                                                                                                                                                                                                                 | No. | 4  |  |  |  |  |  |  |
|  |     | (iv) 4.5 m Single Leg Extension                                                                                                                                                                                                                                                                  | No. | 8  |  |  |  |  |  |  |
|  |     | (v) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                   | No. | 8  |  |  |  |  |  |  |
|  |     | (vi) 4.5 m Body Extension                                                                                                                                                                                                                                                                        | No. | 2  |  |  |  |  |  |  |
|  |     | (vii) 9.0 m Body Extension                                                                                                                                                                                                                                                                       | No. | 2  |  |  |  |  |  |  |
|  |     | (viii) Stubs                                                                                                                                                                                                                                                                                     | No. | 12 |  |  |  |  |  |  |
|  | (c) | <u>Tower Type "DGM"</u>                                                                                                                                                                                                                                                                          |     |    |  |  |  |  |  |  |
|  |     | (i) Basic Tower Body                                                                                                                                                                                                                                                                             | No. | 3  |  |  |  |  |  |  |
|  |     | (ii) 1.5 m Single Leg Extension                                                                                                                                                                                                                                                                  | No. | 4  |  |  |  |  |  |  |
|  |     | (iii) 3.0 m Single Leg Extension                                                                                                                                                                                                                                                                 | No. | 4  |  |  |  |  |  |  |
|  |     | (iv) 4.5 m Single Leg Extension                                                                                                                                                                                                                                                                  | No. | 8  |  |  |  |  |  |  |
|  |     | (v) 6.0 m Single Leg Extension                                                                                                                                                                                                                                                                   | No. | 8  |  |  |  |  |  |  |
|  |     | (vi) 4.5 m Body Extension                                                                                                                                                                                                                                                                        | No. | 2  |  |  |  |  |  |  |

|   |        |                                                                                                                                                                                                                                              |     |       |  |  |  |  |  |  |
|---|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|--|--|--|--|--|--|
|   | (vii)  | 9.0 m Body Extension                                                                                                                                                                                                                         | No. | 2     |  |  |  |  |  |  |
|   | (viii) | Stubs                                                                                                                                                                                                                                        | No. | 12    |  |  |  |  |  |  |
|   | (d)    | <b><u>Tower Type "TGM"</u></b>                                                                                                                                                                                                               |     |       |  |  |  |  |  |  |
|   | (i)    | Basic Tower Body                                                                                                                                                                                                                             | No. | -     |  |  |  |  |  |  |
|   | (ii)   | 6.0 m Single Leg Extension                                                                                                                                                                                                                   | No. | -     |  |  |  |  |  |  |
|   | (iii)  | Stubs                                                                                                                                                                                                                                        | No. | -     |  |  |  |  |  |  |
|   |        | <b><u>Conductor and OPGW (With Associated Equipment)</u></b>                                                                                                                                                                                 |     |       |  |  |  |  |  |  |
| 2 |        | Furnish 795 KCM ACSR "Drake" Conductor                                                                                                                                                                                                       | km  | 38.40 |  |  |  |  |  |  |
| 3 |        | Furnish                                                                                                                                                                                                                                      |     |       |  |  |  |  |  |  |
|   | (a)    | OPGW with at least 24 fibers                                                                                                                                                                                                                 | km  | 5     |  |  |  |  |  |  |
|   | (b)    | Joint boxes for OPGW                                                                                                                                                                                                                         |     |       |  |  |  |  |  |  |
|   | (i)    | OPGW-OPGW (A Type)                                                                                                                                                                                                                           | No. | 1     |  |  |  |  |  |  |
|   | (ii)   | OPGW-OPGW Cable ( B Type)                                                                                                                                                                                                                    | No. | 0     |  |  |  |  |  |  |
|   | (iii)  | OPGW-attaching Clamps                                                                                                                                                                                                                        | No. | 60    |  |  |  |  |  |  |
|   | (iv)   | Fibre Optic Approach Cable                                                                                                                                                                                                                   | km  | -     |  |  |  |  |  |  |
|   | (c)    | Test Equipment, Installation and Maintenance Tools                                                                                                                                                                                           |     | -     |  |  |  |  |  |  |
|   | -      | Fiber Optic Talk Set (Set comprised two units)                                                                                                                                                                                               | Set | -     |  |  |  |  |  |  |
|   | -      | Fiber Optic Tool Kit                                                                                                                                                                                                                         | Set | -     |  |  |  |  |  |  |
|   | -      | OTDR with range $\geq 400$ km Yokogawa AQ7260 or equivalent                                                                                                                                                                                  | Set | -     |  |  |  |  |  |  |
| 4 |        | Furnish 9.15 mm dia EHS Shieldwire                                                                                                                                                                                                           | km  | 6.40  |  |  |  |  |  |  |
|   |        | <b><u>Insulator Hardware Assemblies (Complete Hardware Strings for Quad Bundle ACSR Drake Conductor)</u></b>                                                                                                                                 |     |       |  |  |  |  |  |  |
| 5 |        | Furnish Single 'V' String Suspension Assemblies type "VS(4)" including 25x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'SGM' as per specification drawing No. NTDC/DESIGN/01E151 | Set | 24    |  |  |  |  |  |  |

|    |                                                                                                                                                                                                                                                          |     |    |  |  |  |  |  |  |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|--|--|--|--|--|--|
| 6  | Furnish Single 'V' String Suspension Assemblies type "VJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. NTDC/DESIGN/01E153      | Set | 6  |  |  |  |  |  |  |
| 7  | Furnish Single 'I' String Suspension Assemblies type "IJ(4)" including 32x2 Nos. Pre-RTV Coated 80 kN E&M Strength Insulators (Porcelain or Glass)* for single circuit tower type 'AGM' & 'DGM' as per specification drawing No. 4029/169/401C/TD/01E004 | Set | 12 |  |  |  |  |  |  |
| 8  | Furnish Quad String Dead End Assemblies "DE(4)" for single circuit tower types 'AGM' & 'DGM' including 32x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. 4029/169/401C/TD/01E005            | Set | 36 |  |  |  |  |  |  |
| 9  | Furnish Transposition Assembly Type IT(4) for tower type 'TGM' including 29x4 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* as per specification drawing No. NTDC/DESIGN/01E152                                               | Set | -  |  |  |  |  |  |  |
| 10 | Furnish Double String Dead End Assemblies "DSD1(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Tower side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E010                       | Set | 3  |  |  |  |  |  |  |
| 11 | Furnish Double String Dead End Assemblies "DSD2(4)" including 29x2 Nos. Pre-RTV Coated 160 kN E&M Strength Insulators (Porcelain or Glass)* for Gantry side on Gantry span as per specification drawing No. 4029/169/401C/TD/01E011                      | Set | 3  |  |  |  |  |  |  |
|    | <b>Hardware for OPGW &amp; Shieldwire</b>                                                                                                                                                                                                                |     |    |  |  |  |  |  |  |
| 12 | Furnish Suspension Assembly for OPGW including AGS clamp for single circuit tower type 'SGM' & 'TGM' as per specification                                                                                                                                | Set | 8  |  |  |  |  |  |  |

|    |                                                                                                                                                                          |     |     |  |  |  |  |  |  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|--|--|--|--|--|--|
| 13 | Furnish Double Tension Set for jointing of OPGW on suspension tower as per specification                                                                                 | Set | 1   |  |  |  |  |  |  |
| 14 | Furnish Double Tension Set for jointing / non jointing of OPGW on tension towers as per specification                                                                    | Set | 6   |  |  |  |  |  |  |
| 15 | Overhead shield wire suspension assembly for tower type 'SGM' & 'TGM' as per specification drawing                                                                       | Set | 8   |  |  |  |  |  |  |
| 16 | Overhead shieldwire dead end assembly for tower type 'AGM' & 'DGM' as per specification drawing                                                                          | Set | 12  |  |  |  |  |  |  |
|    | <b><u>Accessories and Dampers</u></b>                                                                                                                                    |     |     |  |  |  |  |  |  |
| 17 | Furnish Conductor Compression Splice (pre-filled with appropriate filler compound) for 795 kcmil ACSR "Drake" Conductor.                                                 | No. | 13  |  |  |  |  |  |  |
| 18 | Furnish Conductor Repair Sleeve for 795 KCM ACSR "Drake" Conductor.                                                                                                      | No. | 7   |  |  |  |  |  |  |
| 19 | Furnish Conductor Dead-End Compression Body (pre-filled with appropriate filler compound) including jumpers dead end terminal pads for 795 kcmil ACSR "Drake" Conductor. | No. | 185 |  |  |  |  |  |  |
| 20 | Furnish Spacer Damper for 795 KCM ACSR "Drake" Conductor.                                                                                                                | No. | 331 |  |  |  |  |  |  |
| 21 | Furnish Stockbridge Vibration Dampers for 795 kcmil ACSR "Drake" Conductor                                                                                               | No. | 83  |  |  |  |  |  |  |
| 22 | Furnish stock bridge vibration dampers for OPGW.                                                                                                                         | No. | 42  |  |  |  |  |  |  |
| 23 | Furnish stock bridge vibration dampers for Shield Wire.                                                                                                                  | No. | 42  |  |  |  |  |  |  |
| 24 | Compression splice for 9.15 mm dia EHS Shield Wire                                                                                                                       | No. | 2   |  |  |  |  |  |  |
|    | <b><u>Grounding Material</u></b>                                                                                                                                         |     |     |  |  |  |  |  |  |
| 25 | Furnish 16 mm diameter 3.0 m long copper covered ground rods.                                                                                                            | No. | 28  |  |  |  |  |  |  |
| 26 | Furnish flat to cable connector.                                                                                                                                         | No. | 28  |  |  |  |  |  |  |
| 27 | Furnish cable to rod connector.                                                                                                                                          | No. | 28  |  |  |  |  |  |  |

|                                                    |                                              |       |    |  |  |  |  |  |   |
|----------------------------------------------------|----------------------------------------------|-------|----|--|--|--|--|--|---|
| 28                                                 | Furnish 7 No. 10 copper covered ground wire. | Meter | 84 |  |  |  |  |  |   |
|                                                    | Sub-Total of G :                             |       |    |  |  |  |  |  | - |
|                                                    | Total of Item A                              |       |    |  |  |  |  |  | - |
|                                                    | Total of Item B                              |       |    |  |  |  |  |  | - |
|                                                    | Total of Item C                              |       |    |  |  |  |  |  | - |
|                                                    | Total of Item D                              |       |    |  |  |  |  |  | - |
|                                                    | Total of Item E                              |       |    |  |  |  |  |  | - |
|                                                    | Total of Item F                              |       |    |  |  |  |  |  | - |
|                                                    | Total of Item G                              |       |    |  |  |  |  |  | - |
| Total of Column 9 to be forwarded to Grand Summary |                                              |       |    |  |  |  |  |  | - |
|                                                    |                                              |       |    |  |  |  |  |  |   |

- \* The Bidder shall specify the type of insulator being offered.

**Notes:**

- 1 Reference drawings for Bird Guards, along with the installation list/BoQ for tower type TDT, are provided in Volume-III. The Contractor/Manufacturer shall be responsible for calculating and preparing the installation lists/BoQs/drawings of Bird Guards for tower types SGM, AGM, DGM, and TGM, following the same pattern, and shall include the cost in their quoted prices. Bird Guards shall be provided for all tower types accordingly.
- 2 The tower drawings provided in Volume-III indicate normal bolts, which are for indicative purposes only. Anti-theft bolts shall be used for towers.
- 3 The requirement and quantity of Stockbridge vibration dampers for ACSR 'Drake' conductor (Item E-5 above), whether for all spans or specific span lengths, shall be determined by the contractor/manufacturer/supplier based on an analytical damping study.
- 4 The quantities given in Price Schedules are indicative/estimated quantities. The Contractor shall place orders of these materials to manufacturers after detailed Engineering.
- 5 The bidder shall be responsible to furnish the tower material, OPGW, Shield Wire, conductor, insulators, accessories, dampers & hardware for conductor and OPGW, for completion of line in all respect. Contractor will reconcile the material after completion and the left-over/spare material will be handed-over/shifted to the Employer's designated store.

- 6 The contractor shall transport, unload and stack leftover/additional material from site to NTDC designated Warehouse/Store at its own cost.
- 7 Price of any other item, either covered or not in the Price Schedules but is required for the completion, commissioning and successful operation of the T/L shall be deemed to be included in the Price Schedules.
- 8 The applicable standards/specifications along with their amendments placed in Volume-II are to be read carefully before filling up the schedule of prices.
- 9 Mandatory Spare parts will be transported to NGC designated warehouse directly from the port.
- 10 Specify currencies in accordance with ITB 12 of the BDS. Create additional columns for foreign currencies if so required.
- 11 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.

**Signature of Bidder**

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**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-X: 500 kV S/C C5-Ludewala – Section D (Approx. 32 km)**  
**Schedule No.3 - Design Services**

| Item                                                  | Description | Qty. | Unit Price <sup>1</sup><br>Local<br>Currency | Total Price | Total<br>Provincial<br>Sales Tax |
|-------------------------------------------------------|-------------|------|----------------------------------------------|-------------|----------------------------------|
| 1                                                     | 2           | 3    | 4                                            | 5 = 3 x 4   | 6                                |
| 1                                                     |             | Lot  |                                              |             |                                  |
| NOT APPLICABLE                                        |             |      |                                              |             |                                  |
| 2                                                     |             | Lot  |                                              |             |                                  |
| 3                                                     |             | Lot  |                                              |             |                                  |
| TOTAL Column 5 to be carried forward to Grand Summary |             |      |                                              |             |                                  |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>1</sup>Specify currency in accordance ITB 12.

| <b>Design, Manufacture, Procurement, Supply, Laying, Installation, Testing &amp; Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme</b><br><b>Lot-X: 500 kV S/C C5-Ludewala —Section D (Approx. 32 km)</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |          |     |                  |                                                                                                     |                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----|------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------|
| <b><u>SCHEDULE NO.4 - INSTALLATION AND OTHER SERVICES</u></b><br><b><u>(INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)</u></b>                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |          |     |                  |                                                                                                     |                                         |
| Item No.                                                                                                                                                                                                                           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Unit     | Qty | Unit Price (PKR) | Total Price (PKR) Including all Custom duties, taxes and other levies etc. w/o Provincial Sales Tax | Total Provincial Sales tax (PST) in PKR |
| 1                                                                                                                                                                                                                                  | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3        | 4   | 5                | 6=4*5                                                                                               | 7                                       |
|                                                                                                                                                                                                                                    | <b>INSTALLATION (INCLUSIVE OF TRANSPORTATION / INSURANCES AND OTHER INCIDENTAL COSTS)</b>                                                                                                                                                                                                                                                                                                                                                                                                             |          |     |                  |                                                                                                     |                                         |
| <b>A</b>                                                                                                                                                                                                                           | <b><u>Survey</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |     |                  |                                                                                                     |                                         |
| 1                                                                                                                                                                                                                                  | Clearing Right of Way (ROW)                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Lump Sum | 1   |                  |                                                                                                     |                                         |
| 2                                                                                                                                                                                                                                  | Validation of already established centre line prior to foundation construction and preparation of as-built plan & profile drawings of the already prepared plan & profile drawings using PLS-CADD and construction structure lists (to be provided to the Contractor after award of contract) of the constructed transmission line after incorporating all the changes and submitted to the Project Manager. In case of route diversion, payment of the diverted portion will be made as per item A.3 | km       | 32  |                  |                                                                                                     |                                         |



|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                       |  |            |          |  |  |  |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|--|------------|----------|--|--|--|
| 3        | Route alignment and detailed surveying of diverted portion not limited to chainage and leveling, preparation of plan & profile drawings, spotting of towers and preparation of construction structure list & Latitude & Longitude with hand held GPS of each tower location                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                       |  | km         | 3.2      |  |  |  |
|          | <b>Sub-Total A:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                       |  |            |          |  |  |  |
| <b>B</b> | <b><u>Sub-soil Investigations:</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                       |  |            |          |  |  |  |
|          | Sub-Soil Investigation for T/Line at (ii) and confirmatory sub-soil Investigation in varied soil/boulder/rock (including laboratory tests) as per Specifications (Technical Provisions for Construction Clause 10.2) and submission of Sub-Soil Investigation Report.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                       |  |            |          |  |  |  |
| (a)      | From NSL to depth of 15 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                       |  | Lin. Mtr.  | 45       |  |  |  |
| (b)      | From 15 m to depth of 25 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                       |  | Lin. Mtr.  | 10       |  |  |  |
| (c)      | Hand Auger upto depth of 10m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                       |  | Lin. Mtr.  | 40       |  |  |  |
|          | <b>Sub-Total B:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                       |  |            |          |  |  |  |
| <b>C</b> | <b><u>Foundations</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                       |  |            |          |  |  |  |
|          | Reinforced Concrete Spread Foundations (4 legs) complete in all respect in varied soil as well as boulders/rock complete with supply of materials including allignment, peg marking, access, preparatory works, excavation, blasting, leveling, grading of tower site, cutting, dewatering, shuttering, reinforcement, concreting (using Sulphate Resistance Cement conforming to ASTM C-150 Type-V), lean concrete (if required), curing, backfilling of foundations after concreting with excavated/borrowed earth (irrespective of lead), application of three (03) coats hot bitumen (ExpanProof* 10 – Fospak bitumen and compaction of backfill material in layers, stub setting and site restoration etc. including tower staking (Latitude & Longitude with hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type as per drawings and specifications: |                                                                       |  |            |          |  |  |  |
|          | (a)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | SGM (Complete Foundation 4 Legs) as per Drawing No.3206/169/TD/01G100 |  |            |          |  |  |  |
|          | (i)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Foundation Type Do (Dry)                                              |  | Foundation | <b>6</b> |  |  |  |
|          | (ii)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Foundation Type D1 (Dry)                                              |  | Foundation | <b>2</b> |  |  |  |

|          |                                |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |    |  |  |  |
|----------|--------------------------------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----|--|--|--|
|          |                                | (iii) | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Foundation | 0  |  |  |  |
|          |                                | (iv)  | Foundation Type S1 (Semi-Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Foundation | 0  |  |  |  |
|          |                                | (v)   | Foundation Type W (Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Foundation | 0  |  |  |  |
|          | (b)                            |       | AGM (Complete Foundation 4 Legs) as per Drawing No. 3206/169/TD/01G101                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |    |  |  |  |
|          |                                | (i)   | Foundation Type Do (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 1  |  |  |  |
|          |                                | (ii)  | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Foundation | 0  |  |  |  |
|          |                                | (iii) | Foundation Type W (Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Foundation | 0  |  |  |  |
|          | (c)                            |       | DGM (Complete Foundation 4 Legs) as per Drawing No. 3206/169/TD/01G102                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |    |  |  |  |
|          |                                | (i)   | Foundation Type Do (Dry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Foundation | 2  |  |  |  |
|          |                                | (ii)  | Foundation Type D1 (Dry) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Foundation | 0  |  |  |  |
|          |                                | (iii) | Foundation Type S (Semi-Submerged) (Refer to Note No. 07)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Foundation | 0  |  |  |  |
|          | <b>Sub-Total C:</b>            |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |    |  |  |  |
| <b>D</b> | <b><u>Pile Foundations</u></b> |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |    |  |  |  |
|          | D-1                            |       | Reinforced concrete pile foundations (cast in situ installation) complete in all type of soil as well as boulders/gravels/rock with supply of materials including excavation, drilling/boring, shuttering, reinforcement, concreting, bitumen coating, backfilling, installation of Stubs, tower grounding, site clearing etc. using Sulphate Resistance Cement conforming to ASTM C-150 Type-V shall be used including tower staking (Latitude & Longitude with RTK/hand held GPS of each tower location should also be reported) and installation of stubs & tower grounding for tower type: |            |    |  |  |  |
|          | (a)                            |       | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, SGM, and drawing No. 3206/169/TD/01G110                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Foundation | 55 |  |  |  |

|  |      |                                                                                                                                                        |            |           |  |  |  |
|--|------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|--|--|--|
|  | (b)  | Reinforced concrete single pile per footing 900 mm dia. as per drawing No. <b>3206/169/TD/01G110</b> (including steel liner/casing), if required.      |            |           |  |  |  |
|  | (i)  | Pile shaft upto depth of 8 m                                                                                                                           | Lin.mtr    | 1760      |  |  |  |
|  | (ii) | Pile shaft upto depth 08 - 13 m                                                                                                                        | Lin.mtr    | 120       |  |  |  |
|  | (c)  | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, AGM, and drawing No. <b>3206/169/TD/01G111</b>                    | Foundation | <b>9</b>  |  |  |  |
|  | (d)  | Reinforced concrete single pile per footing 900 mm dia. as per drawing No. <b>3206/169/TD/01G111</b> (including steel liner/casing), if required.      |            |           |  |  |  |
|  | (i)  | Pile shaft upto depth of 15 m                                                                                                                          | Lin.mtr    | 540       |  |  |  |
|  | (ii) | Pile shaft depth 15 - 20 m                                                                                                                             | Lin.mtr    | 80        |  |  |  |
|  | (e)  | Reinforced concrete pile caps with chimney grade and stub setting as per tower type, DGM, and drawing No. <b>3206/169/TD/01G112</b>                    | Foundation | <b>12</b> |  |  |  |
|  | (f)  | Reinforced concrete single pile per footing 1200 mm dia. as per drawing No. <b>3206/169/TD/01G112</b> (including steel liner/casing), if required.     |            |           |  |  |  |
|  | (i)  | Pile shaft upto depth of 15 m                                                                                                                          | Lin.mtr    | 720       |  |  |  |
|  | (ii) | Pile shaft depth 15 - 20 m                                                                                                                             | Lin.mtr    | 240       |  |  |  |
|  | D-2  | Pile load test in compression confirming to ASTM D1143 / D1143M and in uplift confirming to ASTM D3689 / D3689M at 2.5 times of tower foundation loads |            |           |  |  |  |
|  | (a)  | SGM (In Compression)                                                                                                                                   | Pile       | 1         |  |  |  |
|  | (b)  | SGM (In Tension/Uplift)                                                                                                                                | Pile       | 1         |  |  |  |
|  | (c)  | DGM (In Compression)                                                                                                                                   | Pile       | 1         |  |  |  |
|  | (d)  | DGM (In Tension/Uplift)                                                                                                                                | Pile       | 1         |  |  |  |

|          |                                                                                                                                                                                                                                                                                               |      |                                                                                                                                                         |                    |       |  |  |  |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|--|--|--|
|          |                                                                                                                                                                                                                                                                                               | (e)  | Reinforced concrete single Test pile per footing 900 mm dia. as per drawing No. 3206/169/TD/01G110 (including steel liner/casing), if required.         |                    | 2     |  |  |  |
|          |                                                                                                                                                                                                                                                                                               | (i)  | Pile shaft upto depth of 8 m                                                                                                                            | Lin.mtr            | 16    |  |  |  |
|          |                                                                                                                                                                                                                                                                                               | (ii) | Pile shaft upto depth 08 - 13 m                                                                                                                         | Lin.mtr            | 10    |  |  |  |
|          |                                                                                                                                                                                                                                                                                               | (f)  | Reinforced concrete single Test pile per footing 1200 mm dia. as per drawing No. <b>3206/169/TD/01G112</b> (including steel liner/casing), if required. |                    | 2     |  |  |  |
|          |                                                                                                                                                                                                                                                                                               | (i)  | Pile shaft upto depth of 20 m                                                                                                                           | Lin.mtr            | 40    |  |  |  |
|          | D-3                                                                                                                                                                                                                                                                                           |      | Sonic Integrity Test at pile foundation confirming to ASTM D5882                                                                                        | No.                | 70    |  |  |  |
|          | <b>Sub-Total D:</b>                                                                                                                                                                                                                                                                           |      |                                                                                                                                                         |                    |       |  |  |  |
| <b>E</b> | <b><u>Erection of Steel Towers</u></b>                                                                                                                                                                                                                                                        |      |                                                                                                                                                         |                    |       |  |  |  |
| 1        | Transport and Install 500kV single circuit towers type SGM, AGM, DGM & TGM with all accessories i.e anti climbing devices, aerial markers number plates, danger signs, phase plates, Bird Guards etc. in accordance with requirements of Bidding Documents                                    |      |                                                                                                                                                         | Ton                | 1,321 |  |  |  |
| 2        | Welding of erected tower bolts & nuts after final inspection upto height of 8.0 m from top of foundation chimney as per specification drawing                                                                                                                                                 |      |                                                                                                                                                         | Each tower         | 114   |  |  |  |
|          | <b>Sub-Total E:</b>                                                                                                                                                                                                                                                                           |      |                                                                                                                                                         |                    |       |  |  |  |
| <b>F</b> | <b><u>Stringing of Conductor and OPGW</u></b>                                                                                                                                                                                                                                                 |      |                                                                                                                                                         |                    |       |  |  |  |
| 1        | Transport & Install 795KCM ACSR Drake for quad conductor configuration insulator hanging, hardware assemblies, accessories & dampers etc. complete in all respects as per specifications & approved drawings and methodology.                                                                 |      |                                                                                                                                                         | km D/C Quad Bundle | 32    |  |  |  |
| 2        | Transport & Install OPGW & Shield Wire including installation of drop down lengths for joint boxes at the towers along with allied hardware material including hardware assemblies, joint boxes accessories, dampers etc. complete in all respects as per specifications & approved drawings. |      |                                                                                                                                                         | km (on Both Peaks) | 32    |  |  |  |

|          |                                                                                                                                      |         |      |  |  |   |
|----------|--------------------------------------------------------------------------------------------------------------------------------------|---------|------|--|--|---|
|          | <b>Sub-Total F:</b>                                                                                                                  |         |      |  |  |   |
| <b>G</b> | <b><u>Testing &amp; Commissioning</u></b>                                                                                            |         |      |  |  |   |
| 1        | Testing and commissioning of the line                                                                                                | Lumpsum | 1    |  |  |   |
|          | <b>Sub-Total G:</b>                                                                                                                  |         |      |  |  |   |
| <b>H</b> | <b><u>ENVIRONMENTAL AND SOCIAL SAFEGUARDS</u></b>                                                                                    |         |      |  |  |   |
| 1        | Tree Plantation (Minimum height 4 feet)                                                                                              | No.     | 3000 |  |  |   |
| 2        | Water quality monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route. | No.     | 28   |  |  |   |
| 3        | Ambient Air monitoring / testing / analysis on quarterly basis for the whole project period at three locations along the TL route.   | No.     | 28   |  |  |   |
| 4        | Noise monitoring / analysis / measurement on quarterly basis for the whole project period at three locations along the TL route.     | No.     | 28   |  |  |   |
|          | <b>Sub-Total H:</b>                                                                                                                  |         |      |  |  | - |
|          |                                                                                                                                      |         |      |  |  |   |
| <b>I</b> | <b><u>INSTALLATION SERVICES FOR ADDITIONAL WORK</u></b>                                                                              |         |      |  |  |   |
| 1        | Grading/Cutting/Excavation (Dry Soil)                                                                                                | Cu. m.  | 60   |  |  |   |
| 2        | Excavation (semi-submerged soil)                                                                                                     | Cu. m.  | 40   |  |  |   |
| 3        | Excavation (submerged soil)                                                                                                          | Cu. m.  | 40   |  |  |   |
| 4        | Blasting/Cutting/Excavation/Grading (boulder/Rock)                                                                                   | Cu. m.  | 50   |  |  |   |
| 5        | Concrete (3000 psi at 28 days) furnished and installed                                                                               | Cu. m.  | 100  |  |  |   |
| 6        | Concrete (4000 psi at 28 days) furnished and installed                                                                               | kg      | 25   |  |  |   |
| 7        | Reinforcing Bars furnished and installed (Grade-60)                                                                                  | Cu. m.  | 1000 |  |  |   |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                             |        |     |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|--------|-----|--|--|--|
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Overhaul from Borrow and Compaction (regardless of the distance for borrow) | Cu. m. | 100 |  |  |  |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Lean concrete furnished and installed (2000 psi strength at 28 days)        | Cu. m. | 70  |  |  |  |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Compacted crush+sand (50:50 ratio) installed under footings                 | Sq. m  | 50  |  |  |  |
| 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Bitumen coating for footing                                                 | L.m    | 50  |  |  |  |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Compacted Backfill                                                          | L.m    | 100 |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Sub-Total I:</b>                                                         |        |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                             |        |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Total of Item A</b>                                                      |        |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Total of Item B</b>                                                      |        |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Total of Item C</b>                                                      |        |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Total of Item D</b>                                                      |        |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Total of Item E</b>                                                      |        |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Total of Item F</b>                                                      |        |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Total of Item G</b>                                                      |        |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Total of Item H</b>                                                      |        |     |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Total of Item I</b>                                                      |        |     |  |  |  |
| <b>Total (Column 6) to be carried forward to Grand Summary</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                             |        |     |  |  |  |
| <p><b><u>Notes:</u></b></p> <ol style="list-style-type: none"> <li>1 The quantities mentioned in the BOQ are estimated quantities. These quantities are to be used for bid evaluation purpose only. The actual quantities may vary depending upon detailed engineering and approved drawings. However, the unit rates for material and service quoted in the BOQ/ bid shall remain firm and final if design is unchanged.</li> <li>2 Price of any other item specifically not covered in the Price Schedules but is required for the completion, commissioning and operation of the transmission line shall be deemed to be included in the Price Schedules.</li> </ol> |                                                                             |        |     |  |  |  |

- 3 In case of failure by the bidder to fill the price of Sales Tax in relevant column, the quoted price of the bidder will be considered inclusive of Sales Tax applicable as per Lax and relevant provisions of the Bidding Documents. In case the bidder takes deviation or mention that prices are exclusive of PST, his bid shall be considered as non-responsive.
- 4 Foundation means four legs of tower.
- 5 An allowance of two percent (2%) of the total installed quantity will be permitted for sag, jumpers and wastage for the conductor and shield wire, one percent (1%) for OPGW and two percent (2%) for lossage of nuts, bolts and washers (for towers only); and one percent (1%) for insulator breakage. These allowances are the maximum permissible and in case of wastage less than these limits all excess material shall be returned to NGC storage yards by the Contractor. For quantities in excess of these limits, the Contractor shall replace or reimburse NGC for the loss. All unused, above allowable limits of waste materials and packing wood are the property of NGC and shall be returned to NGC storage yards by the Contractor.
- 6 In case of discrepancy between unit price and total price, unit price shall prevail and the payment will be made accordingly.
- 7 The Bidder shall quote prices against all items, including those for which the specified quantity is "0". No item shall be left blank or unpriced in the Price Schedule.
- 8 Pile Foundation design will be release after the submission of Pile load test Report.
- 9 Location for Sonic Integrity and sonic integrity test report approval will be accorded by the office of DG (C&SE) NGC.

**Name of  
Bidder**

**Signature  
of Bidder**

**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV Transmission Lines for C-5 Power Evacuation Scheme**  
**Lot-X: 500 kV S/C C5-Ludewala —Section D (Approx. 32 km)**

**SCHEDULE NO. 5 - GRAND SUMMARY**

| Sr.<br>No.                                                      | Description                                                                                      | Bid Prices                    |                                   |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------|
|                                                                 |                                                                                                  | Foreign Currency<br>Component | Local Currency<br>Component (PKR) |
| 1                                                               | Total Schedule No. 1 Plant and Mandatory Spare Parts Supplied from Abroad                        |                               |                                   |
| 2                                                               | Total Schedule No. 2 Plant and Mandatory Spare Parts Supplied from Within the Employer's Country |                               |                                   |
| 3                                                               | Total Schedule No. 3 Design Services                                                             |                               |                                   |
| 4                                                               | Total Schedule No. 4 Installation and Other Services                                             |                               |                                   |
| 5                                                               | Provisional Sum                                                                                  |                               | 1,180 Million                     |
| <b>GRAND TOTAL to be carried forward to Letter of Price Bid</b> |                                                                                                  |                               |                                   |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

- 1 Specify the currency in accordance with ITB 12 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.



**Design, Manufacture, Procurement, Supply, Laying, Installation, Testing & Commissioning of 500 kV  
Transmission Lines for C-5 Power Evacuation Scheme**

**Lot-X: 500 kV S/C C5-Ludewala – Section D (Approx. 32 km)**

**Schedule No. 6 - Recommended Spare Parts**

| Item | Description    | Qty | Unit Price                              |                                                 | Total Price                  |                                |
|------|----------------|-----|-----------------------------------------|-------------------------------------------------|------------------------------|--------------------------------|
|      |                |     | EXW<br>Local Parts<br>Local<br>Currency | CIP<br>Imported<br>Parts<br>Foreign<br>Currency | Local<br>Currency<br>Portion | Foreign<br>Currency<br>Portion |
| 1    | 2              | 3   | 4                                       | 5                                               | 6 = 3 x 4                    | 7 = 3 x 5                      |
|      | NOT APPLICABLE |     |                                         |                                                 |                              |                                |
|      |                |     |                                         |                                                 |                              |                                |

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

## PREAMBLE TO CONDITIONS OF CONTRACT

**Commencement** Sub-Clause 1.1.1

**Date** The date for commencement of the Works shall be **the date when all the following conditions are fulfilled:**

**8.1.1** This Contract Agreement has been duly executed for and on behalf of the Employer and the Contractor.

(ii) The Contractor has submitted to the Employer the performance security and the advance payment security.

**8.1.2** The Employer has paid the Contractor the advance payment.

**8.1.3** The L/C has been established pursuant to sub-clause 33.1.5.

Each party shall use its best efforts to fulfill the above conditions for which it is responsible as soon as practicable.

**Defect Liability** Sub-Clause 1.1.11

**Period** The Defect Liability Period is **365 days** after the date certified in the Taking-Over Certificate. Defect Liability Period shall be subject to extension as provided under Sub-Clause 30.4.

The defects at site considering structural stability, physical appearance and precautionary measures shall be identified by the Employer's Representative.

**The Employer** Sub-Clause 1.1.12.

The Employer is: National Grid Company of Pakistan Ltd. (NGC)

**Address:** **Director General (Procurement),**  
**National Grid Company of Pakistan Ltd. (NGC),**  
8<sup>th</sup> Floor, Shaheen Complex, Egerton Road  
Lahore, Pakistan  
Postal Code: 54000  
Telephone: (0092) 42-99202597  
E-mail address: [dg.procurement@ngc.gov.pk](mailto:dg.procurement@ngc.gov.pk)

**The Engineer** Sub-Clause 1.1.15.

An independent consultant firm shall be hired as an Engineer.

**Project Manager:**

(i) For Lot-I & II:

**Chief Engineer (PD/EHV-I) NGC,**  
 NGC House, 34-Industrial Area,  
 Gulberg-III,  
 Lahore – Pakistan.  
 Phone # +92-42-99263246  
 Fax # +92-42-99263247

(i) For Lot-III, IV, V, VI, VII, VIII, IX, X:

**Chief Engineer (PD/EHV-I) NGC,**  
 Islamabad – Pakistan.

|                                            |                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Time for Completion</b>                 | Sub-Clause 1.1.35.<br>The Time for Completion is <b>600 days</b> from the Commencement Date.                                                                                                                                                                                                     |
| <b>Engineer's Duties &amp; Authorities</b> | Sub-Clause 2.1<br>Amount of Variation Order in emergency is <b>1% of Contract Price.</b>                                                                                                                                                                                                         |
| <b>Confirmation in Writing</b>             | Sub-Clause 2.6<br>8.1.4 If the Contractor shall require the confirmation it shall be notified to the Engineer within <b>ten (10) days.</b><br>(ii) Engineer shall confirm the decision/instruction within <b>fourteen (14) days.</b>                                                             |
| <b>Ruling Language</b>                     | Sub-Clause 5.1.<br>The version in <b>English</b> language (ruling language) shall prevail.                                                                                                                                                                                                       |
| <b>Day to Day Communications</b>           | Sub-Clause 5.2.<br>The language for day to day communications is <b>English.</b>                                                                                                                                                                                                                 |
| <b>As-Built Drawings</b>                   | Sub-Clause 6.10<br>As-Built drawings shall be provided to the Engineer within <b>twenty eight (28) days</b> from the date of issue of Taking Over Certificate.                                                                                                                                   |
| <b>General Obligations</b>                 | Sub-Clause 8.1<br>Date for commencing work: Commencement Date                                                                                                                                                                                                                                    |
| <b>Programme to be Furnished</b>           | The Employer will not provide any Erection, stringing, Testing Equipment and Maintenance Tools for this project.<br>Sub-Clause 12.1.<br>The Programme must be submitted in the form of <b>Bar chart or Critical Path Method (CPM), the PERT network, or other internationally used programs.</b> |
| <b>Employer's Equipment</b>                | Sub-Clause 14.4.<br>The following Employer's equipment is available for use by the Contractor under the Employer's operation: <b>NIL</b>                                                                                                                                                         |
| <b>Time for Completion</b>                 | Sub-Clause 25.1<br>8.1.5 Place of the Project: <b>Faisalabad, Khushab, Sargodha &amp; Chashma, Pakistan</b><br>(ii) Period: <b>As mentioned in Sub-Clause 1.1.35.</b>                                                                                                                            |

|                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Earlier Completion</b>            | Sub-Clause 26.3<br><b>8.1.6</b> Amount of Bonus per day: <b>Nil</b><br>(ii) Max. Amount of Bonus: <b>Nil</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Delay in Completion</b>           | Sub-Clause 27.1.<br>Failure to meet the Time for Completion entitles the Employer to levy Liquidated Damages as follows:<br>Percentage per day: <b>0.067%</b><br>Maximum: <b>10% of total contract price</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Prolonged Delay</b>               | Sub-Clause 27.2.<br>Maximum amount recoverable from the Contractor by the Employer shall be calculated in accordance with GCC 42.2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Payment</b>                       | Sub-Clause 33.5<br><b>8.1.7</b> Period of Payment by Employer to Contractor: <b>45 days</b><br>(ii) Period of Final Certificate of Payment: <b>60 days</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Payment in Foreign Currencies</b> | Sub-Clause 35.1.<br>Payment in foreign currencies shall be arranged as follows:<br><b>Payment in foreign currency will be made from foreign exchange component available with NGC except to the extent of price adjustment claims under GCC 47.1 which will be paid in equivalent PKR on the date of payment to the EPC Contractor in Pakistan.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Insurance of Works</b>            | Sub-Clause 43.1.<br>The deductible limits in the insurance cover of the Works: <b>Nil</b><br>Sub-Clause 43.1.(a)<br>The additional risks to be insured are: <ul style="list-style-type: none"> <li>a) fire, smoke, explosion, falling objects, earthquake, perils of the sea, tempest, impact by aircraft or land vehicles, aircraft and other aerial devices or articles dropped therefrom, lightning, strike, riot, civil commotion, escape of water, inundation, rain, snow, landslides, flood, act of God, vandalism or malicious damage, windstorm, or hail storm and</li> <li>b) collision, upset, overturn, derailment, stranding or sinking of an automobile or any conveyance of a common carrier by land, water or air in which the Goods or any part thereof are being carried including overland transportation in Pakistan from port of entry/ex-factory (Pakistan) to the Site, and</li> <li>c) theft, burglary or attempted theft or burglary, and</li> <li>d) any loss or damage during pre-erection storage, and</li> <li>e) faults in construction and erection, lack of skill,</li> </ul> |

|                                                      |                                                                                                                                                                                                                                                                    |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                      | lack of experience, negligence, malicious act, and                                                                                                                                                                                                                 |
|                                                      | f) any other sudden and unforeseen event such as loss or damage due to collapse etc. on site, transport of items to be erected, and                                                                                                                                |
|                                                      | g) actions of Employer in the operation of Goods/Work or part thereof on behalf of the Contractor.                                                                                                                                                                 |
| <b>Third Party Liability</b>                         | Sub-Clause 43.3.<br>The amount of insurance against third party liability taken out by the Contractor shall not be less than: <b>Rs. 4,000,000 per any one accident or series of accidents arising out of one occurrence with number of occurrences unlimited.</b> |
| <b>Payment on Termination for Employer's Default</b> | Sub-Clause 46.3.<br>The additional amount payable by the Employer on termination shall not exceed: <b>As reasonably determined and certified by the Engineer.</b>                                                                                                  |
| <b>Notices to Employer and Engineer</b>              | Sub-Clause 49.2.<br>The address of the Employer for notices is the same as given in Sub-Clause 1.1.12 here above.<br><br>The address of the Project Manager/Engineer for notices is the same as given in Sub-Clause 1.1.15 here above.                             |
| <b>Disputes &amp; Arbitration</b>                    | Sub-Clause 50.4<br>Venue of Arbitration is Lahore, Pakistan.                                                                                                                                                                                                       |
| <b>Applicable Law</b>                                | Sub-Clause 51.1.<br>The applicable law is <b>the law of Islamic Republic of Pakistan.</b>                                                                                                                                                                          |
| <b>Procedural Law for Arbitration</b>                | Sub-Clause 51.2.<br>The procedural law for arbitration is <b>Pakistan Arbitration Act 1940 as amended or any statutory modifications or re-enactment thereof for the time being in force.</b>                                                                      |
| <b>Language and Place of Arbitration</b>             | Sub-Clause 51.3.<br>The language of arbitration is <b>English</b> language.<br>The place of arbitration is Lahore, <b>Pakistan.</b>                                                                                                                                |

### **[Notes on the Conditions of Contract]**

The Conditions of Contract comprise two parts:

- (I) General Conditions of Contract**
- (II) Particular Conditions of Contract**

Over the years, a number of “model” General Conditions of Contract have evolved. The one used in these Standard Bidding Documents was prepared by the International Federation of Consulting Engineers (Federation Internationale des Ingenieurs-Conseils, or FIDIC), and is commonly known as the FIDIC Conditions of Contract. (The used version is the 1987 edition, reprinted in 1988 with editorial amendments.)

The FIDIC Conditions of Contract have been prepared for an ad measurement (unit price or unit rate) type of contract, and cannot be used without major modifications for other types of contract, such as lump sum, turnkey, or target cost contracts.

The standard text of the General Conditions of Contract chosen must be retained intact to facilitate its reading and interpretation by bidders and its review by the Employer. Any amendments and additions to the General Conditions, specific to the contract in hand, should be introduced in the Particular Conditions of Contract.

The use of standard conditions of contract for all electrical/mechanical Works will ensure comprehensiveness of coverage, better balance of rights or obligations between Employer and Contractor, general acceptability of its provisions, and savings in time and cost for bid preparation and review, leading to more economic prices.

The FIDIC Conditions of Contract are copyrighted and may not be copied, faxed, or reproduced. Without taking any responsibility of its being accurate, Pakistan Engineering Council with prior consent of FIDIC Secretariat, has reproduced herein the FIDIC General Conditions of Contract for reference purpose only which cannot be used by the users for preparing their bidding documents. The bidding document may include a purchased copy, the cost of which can be retrieved as part of the selling price of the bidding document. Alternatively, the FIDIC Conditions of Contract can be referred to in the bidding documents, and the bidders are advised to obtain copies directly from FIDIC.\*

# **PART-I: GENERAL CONDITIONS OF CONTRACT**

## **Definitions and Interpretations**

### **1.1 Definitions**

In the Contract (as hereinafter defined) the following words and expressions shall have the meanings hereby assigned to them:

#### **1.1.1 "Commencement Date" means whichever the latest is of:**

- i) the date specified in the Preamble as the date for commencement of the Works or the date when the Contractor receives,
- ii) such payment in advance of the commencement of the Works as may be specified in the terms of payment, or
- iii) notice of the issue of any import license necessary for commencing performance of the Contract, or
- iv) notice that any legal requirements necessary for the Contract to enter into force have been fulfilled, or
- v) notice that any necessary financial or administrative requirements specified in Part II as conditions precedent to commencement have been fulfilled.

#### **1.1.2 "Conditions" means the Preamble to and these Conditions of Contract, Parts I and II.**

#### **1.1.3 "Contract" means the agreement between the Employer and the Contractor for the execution of the Works incorporating the Conditions, Specification, Employer's Drawings and Contractor's Drawings, priced and completed Schedules, Tender, Letter of Acceptance and such further documents as may be expressly incorporated by the Letter of Acceptance.**

#### **1.1.4 "Contract Agreement" means the documents recording the terms of the Contract between the Employer and the Contractor.**

#### **1.1.5 "Contract Price" means the sum stated in the Letter of Acceptance as payable to the Contractor for the execution of the Works.**

#### **1.1.6 "Contractor" means the person whose tender has been accepted by the Employer and the legal successors in title to the Contractor but not (except with the consent of the Employer) any assignee of the Contractor.**

#### **1.1.7 "Contractor's Drawings" means all drawings, samples, patterns, models**

and operation and maintenance manuals to be submitted by the Contractor in accordance with Clause 6.

- 1.1.8** "Contractor's Equipment" means all appliances or things of whatsoever nature required for the purposes of the Works but does not include Plant.
- 1.1.9** "Contractor's Risks" means the risks defined in Sub-Clause 37.3.
- 1.1.10** "Defects Liability Certificate" means the certificate to be issued by the Engineer to the Contractor in accordance with Sub-Clause 30.11.
- 1.1.11** "Defects Liability Period" means one year or the period stated in Part II following taking over, during which the Contractor is responsible for making good defects and damage in accordance with Clause 30.
- 1.1.12** "Employer" means the person named as such in the Preamble and the legal successors in title to the Employer but not (except with the consent of the Contractor) any assignee of the Employer.
- 1.1.13** "Employer's Drawings" means all the drawings and information provided by the Employer or the Engineer to the Contractor under the Contract.
- 1.1.14** "Employer's Risks" means those risks defined in Sub-Clause 37.2.
- 1.1.15** "Engineer" means the person appointed by the Employer to act as Engineer for the purposes of the Contract and designated as such in the Preamble.
- 1.1.16** "Engineer's Representative" means any representative of the Engineer appointed from time to time by the Engineer under Sub-Clause 2.2.
- 1.1.17** "Final Certificate of Payment", means the certificate to be issued by the Engineer to the Employer in accordance with Sub-Clause 33.10.
- 1.1.18** "Force Majeure" has the meaning assigned to it under Sub-Clause 44.1.
- 1.1.19** "Foreign Currency" means a currency of a country other than that in which Plant is to be installed.
- 1.1.20** "Gross Misconduct" means any act or omission of the Contractor in violation of the most elementary rules of diligence which a conscientious contractor in the same position and under the same circumstances would have followed.
- 1.1.21** "Letter of Acceptance" means the formal acceptance by the Employer of the Tender incorporating any adjustments or variations to the Tender agreed between the Employer and the Contractor.
- 1.1.22** "Performance Security" means the security to be provided by the Contractor in accordance with Sub-clause 10.1. for the due performance of the Contract.



- 1.1.23** "Plant" means machinery, apparatus, materials and all things to be provided under the Contract for incorporation in the Works.
- 1.1.24** "Programme" means the Programme to be submitted by the Contractor in accordance with Sub-Clause 12.1 and any approved revision thereto.
- 1.1.25** "Provisional Sum" means a sum, described as such for the execution of work or for the supply of goods or services, to be used in accordance with Sub-Clause 36.1.
- 1.1.26** "Risks Transfer Date" means the date when the risk of loss of or damage to the Works passes from the Contractor to the Employer in accordance with Sub-Clause 39.1.
- 1.1.27** "Schedule of Prices" means the completed and priced Schedule of Prices, or any part or individual schedule thereof, submitted by the Contractor with his Tender and forming a part of the Contract documents.
- 1.1.28** "Section" means a part of the Works specifically identified as such as in the Contract.
- 1.1.29** "Site" means the place or places, provided or made available by the Employer where work is to be done by the Contractor or to which Plant is to be delivered, together with so much of the area surrounding the same as the Contractor shall with the consent of the Employer use in connection with the Works otherwise than merely for the purposes of access.
- 1.1.30** "Specification" means the specification of the Works included in the Contract and any modification thereof made in accordance with Clause 31.
- 1.1.31** "Subcontractor" means any person (other than the Contractor) named in the Contract for any part of the Works, or any person to whom any part of the Contract has been subcontracted with the consent of the Engineer, and the Subcontractor's legal successors in title but not any assignee of the Subcontractor.
- 1.1.32** "Taking-Over Certificate" means the certificate to be given by the Engineer to the Contractor in accordance with Clause 29.
- 1.1.33** "Tender" means the Contractor's priced offer to the Employer for the Execution of the Works.
- 1.1.34** "Tests on Completion" means the tests specified in the Contract or otherwise agreed by the Engineer and the Contractor to be performed before the Works are taken over by the Employer.
- 1.1.35** "Time for Completion" means the time stated in the Preamble for completing the Works or any Section thereof and passing the Tests on Completion calculated from the Commencement Date unless extended in

accordance with Clause 26.

**1.1.36** "Variation Order" means any written order, identified as such, issued to the Contractor by the Engineer under Sub-Clause 31.1.

**1.1.37** "Works" means all Plant to be provided and work to be done by the Contractor under the Contract.

## **1.2 Headings and Titles**

The headings and titles in these Conditions shall not be deemed part thereof or be taken into consideration in the interpretation or construction of the Contract.

## **1.3 Interpretation**

Words importing persons or parties shall include firms and corporations and any organisation having legal capacity.

Words importing the singular only also include the plural and vice versa where the context requires.

## **1.4 Written Communications**

Wherever in the contract provision is made for a communication to be "written" or "in writing" this means any hand-written, type-written or printed communication, including telex, cable and facsimile transmission.

## **1.5 Notices, Consents and Approvals**

Wherever in the Contract provision is made for the giving of notice, consent or approval by any person, such consent or approval shall not be unreasonably withheld. Unless otherwise specified, such notice, consent or approval shall be in writing and the word "notify" shall be construed accordingly.

## **1.6 Costs, Overhead Charges and Profit**

Whenever by these Conditions the Contractor is entitled to be paid cost, such cost shall be properly incurred and shall include any overhead charges properly allocable thereto but not profit unless so stated. Any profit entitlement shall be added to cost at the percentage stated in the Preamble.

## **1.7 Periods**

In these Conditions "days" means calendar day and "year" means 365 days.

## **Engineer and Engineer's Representative**

### **2.1 Engineer's Duties**

The Engineer shall carry out the duties specified in the Contract.

If the Engineer is required, under the terms of his appointment by the Employer, to obtain the specific approval of the Employer before carrying out any of these duties, full particulars of such requirements shall be set out in Part II.

Except as expressly stated in the Contract the Engineer shall have no authority to relieve the Contractor of any of his obligations under the Contract.

## **2.2 Engineer's Representative**

The Engineer's Representative shall be appointed by and be responsible to the Engineer and shall only carry out such duties and exercise such authority as may be delegated to him by the Engineer under Sub-Clause 2.3.

## **2.3 Engineer's Power to Delegate**

The Engineer may from time to time delegate to the Engineer's Representative any of the duties vested in the Engineer and may at any time revoke such delegation.

Any such delegation or revocation shall be in writing and shall not take effect until a copy thereof has been delivered to the Contractor and the Employer.

Any decision, instruction or approval given by the Engineer's Representative to the Contractor in accordance with such delegation shall have the same effect as though it had been given by the Engineer. However:

(a) any failure of the Engineer's Representative to disapprove any Plant or workmanship shall not prejudice the right of the Engineer to disapprove such Plant or workmanship and to give instructions for the rectification thereof.

(b) if the Contractor questions any decision or instruction of the Engineer's Representative he may refer the matter to the Engineer who shall confirm, reverse or vary such decision or instruction.

## **2.4 Engineer to Act Impartially**

Wherever under the Contract the Engineer is required to exercise his discretion by:

(a) giving his decision, opinion or consent, or

(b) expressing his satisfaction or approval, or

(c) determining value, or

(d) otherwise taking action which may affect the rights and obligations of the Employer or the Contractor,

he shall exercise such discretion impartially within the terms of the Contract and having regard to all the circumstances.

## **2.5 Engineer's Decisions and Instructions**

The Contractor shall proceed with the decisions and instructions given by the Engineer in accordance with these Conditions.

## **2.6 Confirmation in Writing**

The Contractor may require the Engineer to confirm in writing any decision or instruction of the Engineer which is not in writing. The Contractor shall notify the Engineer of such requirement without undue delay. Such a decision or instruction shall not be effective until written confirmation thereof has been received by the Contractor.

## **2.7 Disputing Engineer's Decisions and Instructions**

If the Contractor disputes or questions any decision or instruction under Sub-Clause 2.5 or a written confirmation under Sub-Clause 2.6, he shall give notice to the Engineer within twenty eight (28) days after receipt thereof, giving his reasons.

The Engineer shall within a further period of twenty eight (28) days by notice to the Contractor and the Employer with reasons, confirm, reverse or vary such decision or instruction.

If either party disagrees with the action taken by the Engineer, or if the Engineer fails to reply to the Contractor's notice within the stipulated twenty eight (28) days, and the matter cannot be settled amicably that party shall be at liberty, subject to Sub-Clause 50.1, to refer the matter to arbitration in accordance with the Contract.

## **2.8 Replacement of Engineer**

The Employer shall not appoint any person to act in replacement of the Engineer without the consent of the Contractor.

## **Assignment and Subcontracting**

### **3.1 Assignment**

The Contractor shall not assign the Contract or any part of his obligations under the Contract. A charge in favour of the Contractor's bankers of any

monies due under the Contract shall not be considered an assignment.

#### **4.1 Subcontracting**

The Contractor shall not subcontract the whole of the Works.

Except where otherwise provided by the Contract, the Contractor shall not subcontract any part of the Works without the prior consent of the Engineer.

The Contractor shall however, not require such consent for purchases of materials or to place contracts for minor details or for any part of the Works of which the manufacturer or supplier is named in the Contract.

The Contractor shall be responsible for the acts, defaults and neglects of any Subcontractor, his agents or employees as fully as if they were the acts, defaults or neglects of the Contractor, his agents or employees.

### **Contract Documents**

#### **5.1 Ruling Language**

Where versions of the Contract are prepared in different languages, the version which is to prevail shall be specified in the Preamble. The language of such version is referred to as the ruling language.

#### **5.2 Day to Day Communications**

The language for day to day communications is stated in the Preamble.

#### **5.3 Priority of Contract Documents**

Unless otherwise provided in the Contract, the priority of the Contract documents shall be as follows:

1. The Letter of Acceptance
2. The Preamble
3. The Conditions of Contract, Part II
4. The Conditions of Contract, Part I
5. Any other documents forming part of the Contract.

#### **5.4 Documents Mutually Explanatory**

Subject to Sub-Clause 5.3. the Contract documents shall be taken as mutually explanatory. Any ambiguities or discrepancies shall be resolved by the Engineer, who shall then instruct the Contractor thereon.

If the Contractor considers that compliance with such instructions will result in any cost which the Contractor could not reasonably have anticipated, he shall forthwith inform the Engineer with full supporting details. The Engineer shall then, if he approves, certify such costs as may be reasonable, together with profit where appropriate, which shall be added to the Contract Price.

If on the other hand compliance with such instructions results in lower costs for the Contractor then he had reason to anticipate, the Engineer shall certify a deduction from the Contract Price allowing for profit where appropriate.

### **6.1 Contractor's Drawings**

The Contractor shall submit to the Engineer for approval:

(a) within the time given in the Contract or in the Programme such drawings, samples, models or information as may be called for therein, and in the numbers therein required, and

(b) during the progress of the Works, such drawings of the general arrangement and details of the Works as specified in the Contract or as the Engineer may require.

The Engineer shall signify his approval or disapproval thereof. If he fails to do so within the time given in the Contract or the Programme or if no time limit is specified, within twenty eight (28) days of receipt, they shall be deemed to be approved.

Approved drawings, samples and models shall be signed or otherwise identified by the Engineer.

The Contractor shall supply additional copies of approved drawings in the form and numbers stated in the Contract.

### **6.2 Consequences of Disapproval of Contractor's Drawings**

Any Contractor's Drawings which the Engineer disapprove shall be forthwith modified to meet the requirements of the Engineer and shall be re-submitted.

### **6.3 Approved Contractor's Drawings**

Approved Contractor's Drawings shall not be departed from except as provided in Clause 31.

### **6.4 Inspection of Contractor's Drawings**

The Engineer shall have the right at all reasonable times to inspect, at Contractor's premises, all Contractor's Drawings of any part of the Works.

**6.5 Erection Information**

The Contractor shall provide, within the times stated in the Contract or in the Programme, drawings showing how the Plant is to be affixed and any other information required for:

- (a) preparing suitable foundations or other means of support;
- (b) providing suitable access on the Site for the Plant and any necessary equipment to the place where the Plant is to be erected; and
- (c) making necessary connections to the Plant.

**6.6 Operation and Maintenance Manuals**

Before the Works are taken over in accordance with Clause 29 the Contractor shall supply operation and maintenance manuals together with drawings of the Works as built. These shall be in such detail as will enable the Employer to operate, maintain, adjust and repair all parts of the Works.

Unless otherwise stated in Part II the manuals and drawings shall be in the ruling language, and in such form and numbers as stated in the Contract.

Unless otherwise agreed, the Works shall not be considered to be completed for the purposes of taking over until such manuals and drawings have been supplied to the Employer.

**6.7 Employer's Use of Contractor's Drawings**

Contractor's Drawings may be used by the Employer for no other purpose than completing, operating, maintaining, adjusting and repairing the Works.

**6.8 Contractor's Use of Employer's Drawings**

The Employer's Drawings, Specification and other information submitted by the Employer or the Engineer to the Contractor shall remain the property of the Employer. These shall not, without the consent of the Employer, be used, copied or communicated to a third party by the Contractor unless necessary for the purposes of the Contract.

**6.9 Manufacturing Drawings**

Unless otherwise specified in Part II, the Contractor shall not be required to disclose to the Employer or the Engineer the Contractor's confidential manufacturing drawings, designs, know-how or manufacturing practices, processes or operations.

**7.1 Errors in Contractor's Drawings**

The Contractor shall be responsible for any errors or omissions in the Contractor's Drawings unless they are due to incorrect Employer's Drawings or other written information supplied by the Employer or the Engineer. Approval by the Engineer of the Contractor's Drawings shall not relieve the Contractor from any responsibility under this Sub-Clause.

The Contractor shall bear any costs he may incur as a result of delay in providing Contractor's Drawings and other information or as a result of errors or omissions therein, for which the Contractor is responsible.

The Contractor shall at his own cost carry out any alterations or remedial work necessitated by such errors or omissions for which he is responsible and modify the Contractor's Drawings and such other information accordingly.

The performance of his obligations under this Clause shall be in full satisfaction of the Contractor's liability under this Clause but shall not relieve him of his liability under Sub-Clause 27.1.

## **7.2 Errors by Employer or Engineer**

The Employer shall be responsible for the Employer's Drawings and for other written information supplied by the Employer or the Engineer and for the details of special work specified by either of them. If such Employer's Drawings, information or details are incorrect and necessitate alterations of the work, the Employer shall pay the Contractor the cost of the alterations together with profit as certified by the Engineer.

## **Obligations of the Contractor**

### **8.1 General Obligations**

The Contractor shall, in accordance with the Contract, with due care and diligence, design, manufacture, deliver to Site, erect, test and commission the Plant and carry out the Works within the Time for Completion. The Contractor shall also provide all necessary Contractor's Equipment, superintendence, labour and, except as stated in Part II, all necessary facilities therefor.

### **8.2 Setting Out**

The Contractor shall set out the Works in relation to original points, lines and levels of reference given by the Engineer in writing and provide all necessary instruments, appliances and labour for such purposes.

If, at any time during the execution of the Works, any error appears in the positions, levels, dimensions or alignment of the Works, the Contractor shall rectify the error.



The Contractor shall bear the cost of rectifying the error, unless the error results from incorrect information supplied in writing by the Employer, the Engineer or from default by another contractor, in which case the cost together with profit shall be borne by the Employer.

The checking of any setting-out by the Engineer shall not relieve the Contractor of his responsibility for the accuracy thereof.

#### **9.1 Contract Agreement**

The Contractor shall, if called upon so to do, execute a Contract Agreement recording all the terms of the Contract, to be prepared by and completed at the cost of the Employer in the form annexed hereto.

#### **10.1 Performance Security**

If Part II requires the Contractor to obtain a Performance Security, he shall obtain the same in the sum required, within twenty eight (28) days after the receipt of the Letter of Acceptance. The Performance Security shall be provided by a person and in a form approved by the Employer. The cost of complying with the requirements of this Clause shall be borne by the Contractor.

#### **10.2 Period of Validity**

The Performance Security shall be valid until the Contractor has executed, completed and remedied defects in the Works in accordance with the Contract. No claim shall be made against the Performance Security after the issue of the Defects Liability Certificate and the Performance Security shall be returned to the Contractor within fourteen (14) days of the issue of the Defects Liability Certificate.

#### **10.3 Claims under Performance Security**

Whether or not the Performance Security is stated by its terms to be payable on the demand of the Employer the Employer shall not make a claim under the Performance Security unless one of the following conditions is satisfied:

(a) the Contractor is in breach of the Contract and fails to remedy the breach within forty two (42) days after receiving written notice from the Employer requiring him so to do. The notice shall state the intention to claim under the Performance Security, the amount claimed and the breach relied upon, or

(b) the Employer and the Contractor have agreed in writing that the amount demanded is payable to the Employer, and the amount has not been paid within forty two (42) days thereafter, or

(c) the Employer has obtained an award in arbitration under Clause 50 and

the amount awarded has not been paid within forty two (42) days after the award, or

(d) the Contractor has gone into liquidation or is bankrupt.

In every case the Employer shall, when making the claim, send a copy to the Contractor.

### **11.1 Site Data**

The Tender shall be deemed to have been based on such data on climatic, hydrological and general conditions on the Site and for the operation of the Works as the Employer or the Engineer has made available to the Contractor for the purposes of the Tender. The Contractor shall be responsible for his own interpretation of such data.

### **11.2 Sufficiency of Contract Price**

The Contractor shall be deemed to have satisfied himself on and taken account of in his Tender:

- (a) all the conditions and circumstances affecting the Contract Price,
- (b) the possibility of carrying out the Works as described in the Contract,
- (c) the general circumstances at the Site (if access has been made available to him) and
- (d) the general labour position at the Site.

The Contractor shall not be responsible for the accuracy of information given in writing by the Employer or the Engineer but shall be responsible for his interpretation of information received from whatever source.

### **11.3 Physical Obstructions and Conditions**

If during the execution of the Works on Site the Contractor encounters physical obstructions or conditions of the kind stipulated in Sub-Clause 26.1.c) the Contractor shall be entitled to recover the additional cost incurred in consequence.

The Engineer shall certify and there shall be added to the Contract Price the additional cost of:

- (a) complying with any instruction which the Engineer, after due consultation with the Employer and the Contractor, issues to the Contractor in connection therewith, and
- (b) any necessary measures which the Contractor may take in the absence of specific instructions from the Engineer.

**12.1 Programme to be Furnished**

The Contractor shall submit to the Engineer for his approval the Programme which shall contain the following:

- (a) the order in which the Contractor proposes to carry out the Works (including design, manufacture, delivery to Site, erection, testing and commissioning),
- (b) the times when submission and approval of the Contractor's Drawing are required,
- (c) the times by which the Contractor requires the Employer:
  - (i) to furnish any Employer's Drawings,
  - (ii) to provide access to the Site,
  - (iii) to have completed the necessary civil engineering work (including foundations for the Plant) and
  - (iv) to have obtained any import licences, consents, wayleaves and approvals necessary for the purpose of the Works.

The Contractor shall submit the Programme in the form stated in the Preamble within twenty eight (28) days after the Commencement Date.

The approval by the Engineer of the Programme shall not relieve the Contractor or the Employer from any obligation under the Contract.

**12.2 Alteration to Programme**

No material alteration to the Programme shall be made without the approval of the Engineer.

**12.3 Revision of Programme**

If the progress of the Works does not conform to the Programme, the Engineer may instruct the Contractor to revise the Programme.

If such modifications are required for reasons for which the Contractor is not responsible, the cost of preparing the revised Programme shall be certified by the Engineer and added to the Contract Price.

**13.1 Contractor's Representative**

The Contractor shall employ one or more competent representatives to superintend the carrying out of the Works on Site. They shall be fluent in the language for day to day communications. Their names shall be communicated in writing to the Engineer before work on Site begins.

Any instruction or notice which the Engineer gives to the Contractor's representative shall be deemed to have been given to the Contractor.

### **13.2 Objection to Contractor's Employees**

The Contractor shall, upon the Engineer's written instruction, remove from the Works any person employed by him in the execution of the Works, who misconducts himself or is incompetent or negligent.

### **14.1 Contractor's Equipment**

Except to the extent specified in Part II, the Contractor shall provide all Contractor's Equipment necessary to complete the Works.

All Contractor's Equipment shall, when brought on to the Site, be deemed to be exclusively intended for the execution of the Works. The Contractor shall not remove from the Site any such equipment, except:

- (a) when it is no longer required for the completion of the Works, or
- (b) when the Engineer has given his consent.

### **14.2 Safety Precautions**

The Contractor shall observe all applicable regulations regarding safety on the Site.

Unless otherwise agreed, the Contractor shall, from the commencement of work on Site until taking over provide:

- (a) fencing, lighting, guarding and watching of the Works, and
- (b) temporary roadways, footways, guards and fences which may be necessary for the accommodation and protection of owners and occupiers of adjacent property, the public and others.

### **14.3 Electricity Water and Gas**

The Contractor shall be entitled to use for the purposes of the Works such supplies of electricity, water, gas and other services as may be available on the Site and of which details are given in the Preamble. The Contractor shall pay the Employer a fair price for such use. The Contractor shall at his own cost provide any apparatus necessary for such use.

### **14.4 Employer's Equipment**

The Employer shall, if the Contractor so requests for the execution of the Works, operate any available equipment of which details are given in the Preamble. The Contractor shall pay the Employer a fair price for such use.

The Employer shall during such operation retain control of and be responsible for the safe working of the equipment.

#### **14.5 Clearance of Site**

The Contractor shall from time to time during the progress of the Works clear away and remove all surplus materials and rubbish. On completion of the Works the Contractor shall remove all Contractor's Equipment and leave the whole of the Site and the Works clean and in a workmanlike condition, to the satisfaction of the Engineer.

#### **14.6 Opportunities for Other Contractors**

The Contractor shall, in accordance with the Engineer's instructions, afford to other contractors engaged by the Employer to work on the Site and persons lawfully upon the Site all reasonable opportunities for carrying out their work provided that the same shall not obstruct or disturb the progress of the Works. The Contractor shall also afford such opportunities to the employees of the Employer.

If the Contractor, on the written request of the Engineer, makes available any Contractor's Equipment or provides any other service, the Employer shall pay the Contractor accordingly. The amount to be paid shall be certified by the Engineer and added to the Contract Price.

#### **14.7 Authority for Access**

No persons other than the employees of the Contractor and his Subcontractors shall be allowed on the Site except with the consent of the Engineer.

Facilities to inspect the Works shall at all times be afforded by the Contractor to the Engineer and his representative, the Employer's representatives, authorities and officials.

#### **14.8 Information for Import Permits and Licenses**

The Contractor shall submit to the Employer in good time such details of all Plant and Contractor's Equipment as will enable the Employer to obtain all necessary import permits or licenses.

#### **15.1 Compliance with Statutes, Regulations**

The Contractor shall, in all matters arising in the performance of the Contract, comply in all respects with, give all notices and pay all fees required by the provisions of any national or state statute, ordinance or other law or any regulation or bye-law of any duly constituted authority.

#### **15.2 Compliance with Laws**

The Contractor shall comply with the laws of the country of manufacture concerning the manufacture of the Plant, and the laws of the country where the Plant is to be erected so far as such laws concern the manufacture, erection and operation of the Works.

#### **16.1 Patent Rights**

The Contractor shall indemnify the Employer against all claims of infringement of any patent, registered design, copyright, trade mark or trade name or other intellectual property right provided that all of following conditions are satisfied:

- (a) The claim or proceedings arise out of the design, construction, manufacture or use of Works or any Plant supplied by the Contractor.
- (b) The right was protected at the date of the Contract in the Contractor's country or the country in which the Plant is to be manufactured or erected.
- (c) The infringement or allegation of infringement was not caused by any use of the Works otherwise than for purpose indicated by or reasonably to be inferred from Specification.
- (d) The infringement or allegation of infringement was not caused by the use of any Plant in association or combination with any plant not supplied by the Contractor, unless such association or combination was disclosed to the Contractor prior to the date of the Tender.
- (e) The infringement of or allegation of infringement was not caused by the Contractor following the design or instructions of the Employer or the Engineer.

#### **16.2 Claims in respect of Patent Right**

The Contractor shall be promptly notified of any claim under this Clause made against the Employer. The Contractor may at his own cost conduct negotiations for the settlement of such claim, and any litigation that may arise there from.

The Employer shall not make any admission which might be prejudicial to the Contractor unless the Contractor has failed to take over the conduct of the negotiations or litigation within a reasonable time after having been so requested.

The Contractor may not, however, conduct such negotiations or litigation before he has given the Employer such reasonable security as the Employer may require. The security shall be for an amount which is an assessment of the compensation, damages, expenses and costs for which the Employer

may become liable and which are the subject of the indemnity under Sub-Clause 16.1.

The Employer shall, at the request of the Contractor, provide all available assistance for the purpose of contesting any such claim or action, and shall be repaid all reasonable costs incurred in so doing.

### **16.3 Employer's Warranty for Patent Rights**

If any matter for which the Contractor is not liable to indemnify the Employer under Sub-Clause 16.1 causes the infringement or allegation of infringement by the Contractor of any patent, registered design, trade mark, copyright or other intellectual property right, the Employer shall indemnify the Contractor against all claims damages, expenses and costs which the Contractor may incur in relation thereto. The provisions of Sub-Clause 16.2 shall apply mutatis mutandis.

## **Obligations of the Employer**

### **17.1 Access to and Possession of the Site**

The Employer shall in reasonable time grant the Contractor access to and possession of the Site, which may, however, not be exclusive to the Contractor.

The Employer shall to the extent stated in the Specification provide means of access for the delivery of all Plant and Contractor's Equipment to the Site.

### **17.2 Assistance with Local Regulations**

The Employer shall assist the Contractor in ascertaining the nature and extent of any laws, regulations, orders or bye-laws, and customs in the country where the Plant is to be erected, which may affect the Contractor in the performance of his obligations under the Contract. The Employer shall if so requested procure for the Contractor copies thereof and information relating thereto at the Contractor's cost.

### **17.3 Civil Works on Site**

Any building, structure, foundation or means of access on the Site to be provided by the Employer shall be in a condition suitable for the reception, movement, installation and maintenance of the Works within the time or times indicated in the Programme.

### **17.4 Consents and Wayleaves**

The Employer shall in due time obtain or grant all consents including

permits-to-work, wayleaves and approvals required for the Works.

#### **17.5 Import Permits and Licences**

The Employer shall obtain all import permits or licences required for any part of the Plant or Works in reasonable time having regard to the time for delivery of the Plant and completion of the Works.

#### **Labour**

#### **18.1 Engagement of Labour**

The Contractor shall, unless otherwise provided in the Contract, make his own arrangements for the engagement of all labour and for their payment, housing feeding and transport.

#### **18.2 Returns of Labour**

The Contractor shall submit detailed returns showing the supervisory staff and the numbers of the several classes of labour from time to time employed by the Contractor and Subcontractors on the Site. The returns shall be submitted in such form and at such intervals as the Engineer may prescribe.

#### **18.3 Working Hours**

On the Site, the Contractor shall observe the normal working hours stated in the Preamble. The Employer shall allow the Contractor to carry out work on the Site continuously during such working hours.

The Engineer may after consulting the Employer and the Contractor, direct that work shall be done at other times. The extra cost, together with profit, shall be added to the Contract Price unless it has become necessary for the completion of the Works within the Time for Completion, and this is due to the default of the Contractor.

#### **18.4 Restriction on Working Hours**

No work shall be carried out on the Site outside normal working hours or on the locally recognised days of rest, unless:

- (a) the Contract so provides, or
- (b) the work is unavoidable or necessary for the saving of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Engineer, or
- (c) the Engineer gives his consent.

#### **Workmanship and Materials**



**19.1 Manner of Execution**

All Plant to be supplied shall be manufactured and all work to be done shall be executed in the manner set out in the Contract.

Where the manner of manufacture and execution is not set out in the Contract, the work shall be executed in a proper and workmanlike manner in accordance with recognised good practice.

**19.2 Covering up Work**

The Contractor shall give the Engineer full opportunity to examine, measure and test any work on Site which is about to be covered up or put out of view.

The Contractor shall give due notice to the Engineer whenever such work is ready for examination, measurement or testing.

The Engineer shall then, unless he notifies the Contractor that he considers it unnecessary, without unreasonable delay carry out the examination, measurement or testing.

**19.3 Uncovering Work**

If so instructed by the Engineer, the Contractor shall expose any parts of the Works. The Contractor shall reinstate and make good such parts to the Engineer's satisfaction.

If any parts of the Works have been covered up or put out of view by the Contractor after complying with Sub-Clause 19.2 and are found to be in accordance with the Contract the cost incurred by the Contractor in complying with the Engineer's instructions including profit shall be certified by the Engineer and added to the Contract Price.

**20.1 Independent Inspection**

The Engineer may, if so provided in the Contract or with the Contractor's consent, delegate inspection and testing of Plant to an independent inspector. Any such delegation shall be effected in the manner required by Sub-Clause 2.3 and for this purpose such independent inspector shall be considered as an Engineer's Representative. Notice of such appointment (being not less than 14 days) shall be given by the Engineer to the Contractor.

**20.2 Inspection and Testing During Manufacture**

The Engineer shall be entitled during manufacture to inspect, examine and test the materials and workmanship and check the progress of manufacture of all Plant to be supplied under the Contract. This shall take place on the

Contractor's premises during working hours. If Plant is being manufactured on other premises, the Contractor shall obtain permission for the Engineer to carry out such inspection, examination and testing on those premises.

No such inspection, examination or testing shall release the Contractor from any obligation under the Contract.

### **20.3 Dates for Inspection and Testing**

The Contractor shall agree with the Engineer the time and place for the testing of any Plant as provided in the Contract. The Engineer shall give the Contractor 24 hours notice of his intention to attend the tests.

If the Engineer does not attend on the date agreed, the Contractor may, unless the Engineer instructs the Contractor not to do so, proceed with the tests, which shall be deemed to have been made in the Engineer's presence.

The Contractor shall forthwith forward to the Engineer duly certified copies of the test results. If the Engineer has not attended the test, he shall accept the validity of the test readings.

### **20.4 Facilities for Testing**

Where the Contract provides for tests on the premises of the Contractor or of any Sub-Contractor, the Contractor shall provide such assistance, labour materials, electricity, fuel, stores, apparatus and instruments as may be necessary to carry out the test efficiently.

### **20.5 Certificate of Testing**

When Plant has passed the tests referred to in this Clause, the Engineer shall furnish to the Contractor a certificate or endorse the Contractor's test certificate to that effect.

### **21.1 Rejection**

If, as a result of the inspection, examination or testing referred to in Clause 20, the Engineer decides that any Plant is defective or otherwise not in accordance with the Contract, he may reject such Plant and shall notify the Contractor thereof immediately. The notice shall state the Engineer's objections with reasons. The Engineer shall not reject any Plant for minor defects which do not affect the commercial operation of such Plant.

The Contractor shall then with all speed make good the defect or ensure that any rejected Plant complies with the Contract.

If the Engineer requires such Plant to be retested, the tests shall be repeated under the same terms and conditions. All costs incurred by the Employer by the repetition of the tests shall be deducted from the Contract Price.

**22.1 Permission to Deliver**

The Contractor shall apply in writing to the Engineer for permission to deliver any Plant or Contractor's equipment to the Site. No Plant or Contractor's Equipment may be delivered to the Site without the Engineer's written permission.

The Contractor shall be responsible for the reception on Site of the Plant and Contractor's Equipment.

**Suspension of Works, Delivery or Erection****23.1 Order to Suspend**

The Engineer may at any time instruct the Contractor to:

- (a) suspend progress of the Works, or
- (b) suspend delivery of Plant or Contractor's Equipment which is ready for delivery to the Site at the time for delivery specified in the Programme, or if no time is specified, at the time appropriate for it to be delivered, or
- (c) suspend the erection of Plant which has been delivered to the Site.

When the Contractor is prevented from delivering or erecting Plant in accordance with the Programme the Engineer shall be deemed to have instructed a suspension except when such prevention is caused by the Contractor's default.

The Contractor shall during suspension protect and secure the Works or Plant affected at the Contractor's works or elsewhere or at the Site, as the case may be, against any deterioration, loss or damage.

**24.1 Cost of Suspension**

The additional cost incurred by the Contractor in protection, securing and insuring the Works or Plant and in following the Engineer's instructions under Sub-Clause 23.1 and in resumption of the work, shall be added to the Contract Price.

The Contractor shall not be entitled to be paid any additional costs if such suspension is necessary by reason of a default on the part of the Contractor.

The Contractor shall not be entitled to additional costs unless he notifies the Engineer of his intention to make such claim, within twenty eight (28) days after receipt of the order to suspend progress or delivery or of the date of

deemed suspension under Sub-Clause 23.1.

#### **24.2 Payment in Event of Suspension**

The Contractor shall be entitled to payment for Plant which has not been delivered to Site if the work on Plant or delivery of Plant has been suspended for more than twenty eight (28) days. After twenty eight (28) days of suspension, the Contractor shall be entitled to payment of the value of such Plant as at the date of suspension.

A certificate of payment shall be issued on condition that:

- (a) the Contractor has marked the Plant as the Employer's property in accordance with the Engineer's instructions, and
- (b) the suspension is not due to the Contractor's default.

#### **24.3 Prolonged Suspension**

If suspension under Sub-Clause 23.1. has continued for more than eighty four (84) days, and the suspension is not due to the Contractor's default, the Contractor may by notice to the Engineer require permission to proceed within twenty eight (28) days.

If permission is not granted within that time, the Contractor may treat the suspension as an omission under Clause 31 of the Section it affects, or if the suspension affects the whole of the Works, terminate the Contract and the provisions of Clause 46 shall apply.

#### **24.4 Resumption of Work**

If the Contractor chooses not to treat prolonged suspension as an omission or termination under Sub-Clause 24.3, the Employer shall upon the request of the Contractor, take over the responsibility for protection, storage, security and insurance of the suspended Works and the risk of loss or damage thereto shall thereupon pass to the Employer.

After receipt of permission or an order to proceed, the Contractor, shall after due notice to the Engineer, examine the Works and the Plant affected by the suspension. The Contractor shall make good any deterioration or defect in or loss of the Works or Plant that may have occurred during the suspension. Cost properly incurred by the Contractor which would not have been incurred but for the suspension shall be added to the Contract Price together with profit.

The Contractor shall not be entitled to payment for costs incurred in making good any deterioration, defect or loss caused by faulty workmanship or materials or by the Contractor's failure to take the measures specified in Sub-Clause 23.1.

If the Employer has taken over risk and responsibility for the suspended Works under this Sub-Clause, risk and responsibility shall revert to the Contractor fourteen (14) days after receipt of the permission or order to proceed.

### **Completion**

#### **25.1 Time for Completion**

The Works shall be completed and shall have passed the Tests on Completion within the Time for Completion

#### **26.1 Extension of Time for Completion**

The Contractor may claim an extension of the Time for Completion if he is or will be delayed in completing the Works by any of the following causes:

- (a) extra or additional work ordered in writing under Clause 31,
- (b) exceptional adverse weather conditions,
- (c) physical obstructions or conditions which could not reasonably have been foreseen by the Contractor,
- (d) Employer's or Engineer's instructions, otherwise than by reason of the Contractor's default,
- (e) the failure of the Employer to fulfil any of his obligations under the Contract,
- (f) delay by any other contractor engaged by the Employer,
- (g) any suspension of the Works under Clause 23, except when due to the Contractor's default,
- (h) any industrial dispute,
- (i) the Employer's Risks, or
- (j) Force Majeure.

The Contractor shall give to the Engineer notice of his intention to make a claim for an extension of time within fourteen (14) days of the circumstances for such a claim becoming known to the Contractor. The notice shall be followed as soon as possible by the claim with full supporting details.

The Engineer shall, after due consultation with the Employer and the Contractor, grant the Contractor from time to time, either prospectively or retrospectively, such extension of Time for Completions as may be justified. The Engineer shall notify the Employer and the Contractor accordingly.

The Contractor shall be entitled to such extension whether the delay occurs before or after the Time for Completion.

## **26.2 Delays by Subcontractors**

The Contractor shall be entitled to claim an extension of time if delay on the part of a Subcontractor is due to a cause mentioned in Clause 26.1 and such delay prevents the Contractor from meeting the Time for Completion.

## **26.3 Earlier Completion**

The Employer may require completion of the Works or part thereof earlier than the Time for Completion, on the following conditions:

- (a) The Employer and the Contractor shall first agree the extra sum to be paid for each day by which the Contractor completes the Works or part thereof earlier than the Time for Completion.
- (b) The Contractor shall not become liable under Sub-Clause 27.1 for any failure to complete the Works or the part thereof by the earlier time.

## **27.1 Delay in Completion**

If the Contractor fails to complete the Works within the Time for Completion, the Employer shall be entitled to a reduction in the Contract Price unless it can be reasonably concluded from circumstance that the Employer will suffer no loss.

The Employer shall within a reasonable time give the Contractor notice of his intention to claim a reduction.

The reduction shall be the percentage per day stated in the Preamble of that part of the Contract Price which is attributable to such part of the Works as cannot in consequence of the failure be put to the intended use. The reduction shall be computed for each day between the Time for Completion and the actual date of completion.

The reduction shall in no case exceed the maximum percentage of the Contract Price of such part stated in the Preamble.

Except as provided in Sub-Clause 27.2, such reduction shall be to the exclusion of any other remedy of the Employer in respect of the Contractor's failure to complete within the Time for Completion.

## **27.2 Prolonged Delay**

If the Employer has become entitled to the maximum reduction under Sub-Clause 27.1 for any part of the Works, he may by notice require the Contractor to complete. Such notice shall fix a final time for completion

which shall be reasonable.

If the Contractor fails to complete within such time, and this is not due to a cause for which the Employer or some other contractor employed by him is responsible, the Employer may by further notice to the Contractor either:

- (a) require the Contractor to complete, or
- (b) may himself complete at the Contractor's cost provided that he does so in a reasonable manner, or
- (c) terminate the Contract.

If the Employer terminates the Contract, he shall be entitled to recover from the Contractor any loss he has suffered up to the maximum amount stated in the Preamble. If no maximum amount is stated, the Employer shall not be entitled to recover more than that part of the Contract Price which is attributable to that part of the Works which cannot by reason of the Contractor's failure be put to the intended use.

The Employer shall give credit for the value of any part of the Works which he retains.

### **Tests on Completion**

#### **28.1 Notice of Tests**

The Employer shall give to the Engineer twenty one (21) day's notice of the date after which he will be ready to make the Tests on Completion (the Tests). Unless otherwise agreed, the Tests shall take place within fourteen (14) days after the said date on such day or days as the Engineer shall notify the Contractor.

#### **28.2 Time for Tests**

If the Engineer fails to appoint a time after having been asked to do so, or does not attend at the time and place appointed, the Contractor shall be entitled to proceed with the Test in his absence. The Tests shall then be deemed to have been made in the presence of the Engineer and the results of the Tests shall be accepted as accurate.

#### **28.3 Delayed Tests**

If the Tests are being unduly delayed by the Contractor the Engineer may by notice require the Contractor to make the Tests within twenty one (21) days after the receipt of such notice. The Contractor shall make the Tests on such days within that period as the Contractor may fix and of which he shall give notice to the Engineer.

If the Contractor fails to make the Tests within twenty one (21) days the Engineer may himself proceed with the Tests. All Tests so made by the Engineer shall be at the risk and cost of the Contractor and the cost thereof shall be deducted from the Contract Price. The tests shall then be deemed to have been made in the presence of the Contractor and the results of the Tests shall be accepted as accurate.

#### **28.4 Facilities for Tests on Completion**

Except where otherwise specified, the Employer shall provide free of charge such labour, materials, electricity, fuel, water, stores, apparatus and feedstock as may be reasonably required by the Contractor to carry out the Tests.

#### **28.5 Retesting**

If the Works or any Section fails to pass the Tests, the Engineer or the Contractor may require such Tests to be repeated on the same terms and conditions. All costs to which the Employer may be put by the repetition of the Tests under this Sub-Clause or under Sub-Clause 30.7 shall be deducted from the Contract Price.

#### **28.6 Disagreement as to Result of Tests**

If the Engineer and the Contractor disagree on the interpretation of the Test results, each shall give a statement of his views to the other within fourteen (14) days after such disagreement arises. The statement shall be accompanied by all relevant evidence.

#### **28.7 Consequences of Failure to Pass Tests on Completion**

If the Works or any Section fails to pass the Tests on the repetition thereof under Sub-Clause 28.5, the Engineer, after due consultation with the Employer and the Contractor, shall be entitled to:

- (a) order one further repetition of the Tests under the conditions of Sub-Clause 28.5, or
- (b) reject the Works or Section in which event the Employer shall have the same remedies against the Contractor as are provided under Sub-Clause 30.5 (c), or
- (c) issue a Taking-Over Certificate, if the Employer so wishes, notwithstanding that the Works are not complete. The Contract Price shall then be reduced by such amount as may be agreed by the Employer and the Contractor or, failing agreement, as may be determined by arbitration.



**28.8 Use by the Employer**

In considering the results of Tests carried out under Sub-Clauses 29.3, 29.4 and 30.7, the Engineer shall make allowances for the effect of any use of the Works by the Employer on the Certificate to the performance or other characteristics of the Works.

**28.9 Test Certificate**

As soon as the Works or any Section thereof has passed the Tests, the Engineer shall issue a Certificate to the Contractor and the Employer to that effect.

**Taking Over****29.1 Taking Over**

The Works shall be taken over by the Employer when they have been completed in accordance with the Contract, except in minor respects that do not affect the use of the Works for their intended purpose, have passed the Tests on Completion and a Taking-Over Certificate has been issued or deemed to have been issued in accordance with Sub-Clause 29.2.

**29.2 Taking-Over Certificate**

The Contractor may apply by notice to the Engineer for a Taking-Over Certificate not earlier than fourteen (14) days before the Works will in the Contractor's opinion be complete and ready for taking over under Sub-Clause 29.1.

The Engineer shall within twenty eight (28) days after the receipt of the Contractor's application either:

- (a) issue the Taking-Over Certificate to the Contractor with a copy to the Employer stating the date on which the Works were complete and ready for taking over, or
- (b) reject the application giving his reasons and specifying the work required to be done by the Contractor to enable the Taking-Over Certificate to be issued.

If the Engineer fails either to issue the Taking-Over Certificate or to reject the Contractor's application within the period of twenty eight (28) days he

shall be deemed to have issued the Taking-Over Certificate on the last day of that period.

If the Works are divided by the Contract into Sections the Contractor shall be entitled to apply for separate Taking-Over Certificate for each such Section

### **29.3 Use before Taking Over**

The Employer shall not use any part of the Works unless a Taking-Over Certificate has been issued in respect thereof.

If nevertheless the Employer uses any part of the Works, that part which is used shall be deemed to have been taken over at the date of such use. The Engineer shall on request of the Contractor issue a Taking-Over Certificate accordingly. If the Employer uses any part of the Works before taking over the Contractor shall be given the earliest opportunity of taking such steps as may be necessary to carry out the Tests on Completion.

The provisions of Sub-Clause 27.1 shall not apply to any part of the Works while being so used by the Employer. Clause 30 shall apply as if the part had been taken over on the date it was taken into use.

### **29.4 Interference With Tests on Completion**

If the Contractor is prevented from carrying out the Tests on Completion by a cause for which the Employer or the Engineer or other contractors employed by the Employer are responsible, the Employer shall be deemed to have taken over the Works on the date when the Tests on Completion would have been completed but for such prevention. The Engineer shall issue a Taking-Over Certificate accordingly.

The Works shall not be deemed to have been taken over if they are not substantially in accordance with the Contract.

If the Works are taken over under this Clause the Contractor shall nevertheless carry out the Tests on Completion during the Defects Liability Period. The Engineer shall require the Tests on Completion to be carried out by fourteen (14) days notice and in accordance with the relevant provisions of Clause 28.

Any additional costs to which the Contractor may be put in making the Tests on Completion during the Defects Liability Period, shall be added to the Contract Price.

### **Defects after Taking Over**

### **30.1 Defects Liability Period**

Where any part of the Works is taken over separately from the Works the Defects Liability Period for that part shall commence on the date it was taken over.

### **30.2 Making Good Defects**

The Contractor shall, subject to Sub-Clause 30.9, be responsible of making good any defect in or damage to any part of the Works which may appear or occur during the Defects Liability Period and which arises from, either:

- (a) any defective materials, workmanship or design, or
- (b) any act or omission of the Contractor during the Defects Liability Period.

The Contractor shall make good the Defects or damage as soon as practicable and at his own cost.

### **30.3 Notice of Defects**

If any such defect appears or damage occurs, the Employer or the Engineer shall forthwith notify the Contractor thereof.

### **30.4 Extension of Defects Liability Period**

The provision of this Clause shall apply to all replacements or renewals carried out by the Contractor as if the replacements and renewals had been taken over on the date they were completed.

The Defects Liability Period for the Works shall be extended by a period equal to the period during which the Works cannot be used by reason of a defect or damage. If only part of the Works cannot be used by reason of a defect, the Defect Liability Period shall be extended only for that part.

In neither case shall the Defects Liability Period be extended by more than one year.

When erection or delivery of Plant has been suspended under Sub-Clause 23.1, the Contractor's obligations under this Clause shall not apply to any defects occurring more than three years after it would have been delivered but for the suspension or such period as may be stated in Part II.

### **30.5 Failure to Remedy Defects**

If the Contractor fails to remedy a defect or damage within a reasonable time, the Employer may fix a final time for remedying the defect or damage.

If the Contractor fails to do so, the Employer may:

- (a) carry out the work himself or by others at the Contractor's risk and

cost, provided that he does so in a reasonable manner. The costs properly incurred by the Employer in remedying the defect or damage shall be deducted from the Contract Price, but the Contractor shall have no responsibility for such work, or

- (b) require the Contractor to grant the Employer a reasonable reduction in the Contract Price to be agreed or fixed by arbitration under Clause 50, or
- (c) if the defect or damage is such that the Employer has been deprived of substantially the whole of the benefit of the Works or a part thereof, he may terminate the Contract in respect of such parts of the Works as cannot be put to the intended use. The Employer shall to the exclusion of any remedy under Clause 45 be entitled to recover all sums paid in respect of such parts of the Works together with the cost of dismantling the same, clearing the Site and returning Plant to the Contractor or otherwise disposing of it in accordance with the Contractor's instructions.

### **30.6 Removal of Defective Work**

If the defect of damage is such that repairs cannot be expeditiously carried out on the Site, the Contractor may with the consent of the Engineer or the Employer remove from the Site for the purposes of repair any part of the Works which is defective or damaged.

### **30.7 Further Tests on Completion**

If the replacements or renewals are such that they may affect the performance of the Works the Employer may request that Tests on Completion be repeated to the extent necessary. The request shall be made by notice within twenty eight (28) days after the replacement or renewal. The Tests shall be carried out in accordance with Clause 28.

### **30.8 Right of Access**

Until the Final Certificate of Payment has been issued, the Contractor shall have the right of access to all parts of the Works and to records of the working and performance of the Works.

Such right of access shall be during the Employer's normal working hours at the Contractor's risk and cost. Access shall also be granted to any duly authorised representative of the Contractor whose name has been communicated in writing to the Engineer.

Subject to the Engineer's approval, the Contractor may also at his own risk and cost make any tests which he considers desirable.

### **30.9 Defects in Employer's and Engineer's Designs**

The Contractor shall not be liable for any defects resulting from designs furnished or specified by the Employer or the Engineer.

**30.10 Contractor to Search**

The Contractor shall, if required by the Engineer in writing, search for the cause of any defect, under the direction of the Engineer. Unless the defect is one for which the Contractor is liable under this Clause, the cost of the work carried out by the Contractor in searching for the cause of the defect shall be added to the Contract Price.

**30.11 Defects Liability Certificate**

When the Defects Liability Period for the Works or any part thereof has expired and the Contractor has fulfilled all his obligations under the Contract for defects in the Works or that part, the Engineer shall issue within twenty eight (28) days to the Employer and the Contractor a Defects Liability Certificate to that effect.

**30.12 Exclusive Remedies**

Except in the case of Gross Misconduct, the Employer's remedies under this Clause shall be in place of and to the exclusion of any other remedy in relation to defects whatsoever.

**Variations**

**31.1 Engineer's Right to Vary**

The Engineer may by Variation Order to the Contractor at any time before the Works are taken over, instruct the Contractor to alter, amend, omit, add to or otherwise vary any part of the Works.

The Contractor shall not vary or alter any of the Works, except in accordance with a Variation Order from the Engineer. The Contractor may, however, at any time propose variations of the Works to the Engineer.

**31.2 Variation Order Procedure**

Prior to any Variation Order under Sub-Clause 31.1 the Engineer shall notify the Contractor of the nature and form of such variation.

As soon as possible after having received such notice, the Contractor shall submit to the Engineer:

- (a) a description of work, if any, to be performed and a programme for its execution, and
- (b) the Contractor's proposals for any necessary modifications to the

Programme according to Sub-Clause 26.1 or to any of the Contractor's obligations under the Contract, and

- (c) the Contractor's proposals for adjustment to the Contract Price.

Following the receipt of the Contractor's submission the Engineer shall, after due consultation with the Employer and the Contractor, decide as soon as possible whether or not the variation shall be carried out.

If the Engineer decides that the variation shall be carried out, he shall issue a Variation Order clearly identified as such in accordance with the Contractor's submission or as modified by agreement. If the Engineer and the Contractor are unable to agree the adjustment of the Contract Price, the provisions of Sub-Clause 31.3 shall apply.

### **31.3 Disagreement on Adjustment of the Contract Price**

If the Contractor and the Engineer are unable to agree on the adjustment of the Contract Price, the adjustment shall be determined in accordance with the rates specified in the Schedule of Prices.

If the rates contained in the Schedule of Price are not directly applicable to the specific work in question, suitable rates shall be established by the Engineer reflecting the level of pricing in the Schedule of Prices.

Where rates are not contained in the said Schedule, the amount shall be such as is in all the circumstances reasonable. Due account shall be taken of any over-or under-recovery of overheads by the Contractor in consequence of the variation.

The Contractor shall also be entitled to be paid:

- (a) the cost of any partial execution of the Works rendered useless by any such variation,
- (b) the cost of making necessary alterations to Plant already manufactured or in the course of manufacture or of any work done that has to be altered in consequence of such a variation,
- (c) any additional costs incurred by the Contractor by the disruption of the progress of the Works as detailed in the Programme, and
- (d) the net effect of the Contractor's finance costs, including interest, caused by the variation.

The Engineer shall on this basis determine the rates or prices to enable on-account payment to be included in certificates of payment.

### **31.4 Contractor to Proceed**

On receipt of a Variation Order, the Contractor shall forthwith proceed to carry out the variation and be bound to these Conditions in so doing as if such variation was stated in the Contract.

The work shall not be delayed pending the granting of an extension of the Time for Completion or an adjustment to the Contract Price under Sub-Clause 31.3.

### **31.5 Records of Costs**

In any case where the Contractor is instructed to proceed with variation prior to the determination of the adjustment to the Contract Price in respect thereof the Contractor shall keep records of the cost of undertaking the variation and of time expended thereon. Such records shall be open to inspection by the Engineer at all reasonable times.

## **Ownership of Plant**

### **32.1 Ownership of Plant**

Plant to be supplied pursuant to the Contract shall become the property of the Employer at whichever is the earlier of the following times:

- (a) when Plant is delivered to Site, or
- (b) when by virtue of Sub-Clause 24.2 the Contractor becomes entitled to payment of the value of the Plant.

## **Certificates and Payment**

### **33.1 Terms of Payment**

The terms of payment shall be as stated in the Preamble.

### **33.2 Method of Application**

Unless otherwise specified in Part II applications by the Contractor for payment shall be made to the Engineer as follows:

- (a) in respect of the progress of the Works accompanied by such evidence of the value of the work done as the Engineer may require, and
- (b) in respect of Plant shipped and en route to the Site identifying the Plant concerned and accompanied by such evidence of shipment and of payment of freight and insurance and by such other documents as the Engineer may require, and
- (c) for additional payment in accordance with Clause 34.

Any other application for payment shall state the amounts claimed and the detailed particulars in respect of which the application is made.

### **33.3 Issue of Certificate of Payment**

Within fourteen (14) days after receiving an application for payment which the Contractor was entitled to make the Engineer shall issue a Certificate of Payment to the Employer showing the amount due, with a copy to the Contractor.

A certificate of payment, other than the Final Certificate of Payment, shall not be withheld on account of:

- (a) defects of a minor character which are not such as to affect the use of the Works, or
- (b) any part of the payment applied for being disputed. In such case a certificate of payment for the undisputed amount shall be issued.

### **33.4 Corrections to Certificates of Payment**

The Engineer may in any certificate of payment make any correction or modification that should properly be made in respect of any previous certificate.

### **33.5 Payment**

Unless otherwise specified in Part II, the Employer shall pay the amount certified within twenty eight (28) days from the date of issue of each certificate of payment to the Contractor at his principal place of business.

### **33.6 Delayed Payment**

If payment of any sum payable under Sub-Clause 33.5 is delayed, the Contractor shall be entitled to receive interest on the amount unpaid during the period of delay. Unless otherwise stated in Part II the interest shall be at the annual rate three percentage points above the discount rate of the central bank in the Contractor's country. The Contractor shall be entitled to such payment without formal notice and without prejudice to any other right or remedy.

### **33.7 Remedies on Failure to Certify or Make Payment**

The Contractor shall be entitled to stop the Works by giving fourteen (14) days notice to the Engineer and the Employer, if either:

- (a) the Engineer fails to issue a certificate of payment upon proper application by the Contractor, or



- (b) the Employer fails to make any payment as provided in this Clause.

The cost to the Contractor together with profit occasioned by the stoppage and the subsequent resumption of work, shall be added to the Contract Price.

The Contractor shall also be entitled to terminate the Contract by giving twenty eight (28) days notice to the Engineer and the Employer in any case where the Engineer has failed to issue a certificate of payment upon proper application by the Contractor.

### **33.8 Payment by Measurement**

For any part of the Works which is to be paid according to quantity supplied or work done, the provisions for measurement shall be stated in Part II.

### **33.9 Application for Final Certificate of Payment**

The Contractor shall make application to the Engineer for the Final Certificate of Payment within twenty eight (28) days after the issue of the Defect Liability Certificate, or if more than one, the last Defect Liability Certificate.

The application for the Final Certificate of Payment shall be accompanied by a final account prepared by the Contractor. The final account shall give full details of the value of all Plant supplied and work done under the Contract together with:

- (a) such additions to or deductions from the Contract Price as have been agreed, and
- (b) all claims for additional payment to which the Contractor may consider himself entitled.

### **33.10 Issue of Final Certificate of Payment**

The Engineer shall issue to the Employer with a copy to the Contractor, the Final Certificate of Payment within 28 days after receiving an application in accordance with Sub-Clause 33.9.

If the Contractor has not applied for a Final Certificate of Payment within the time specified in Sub-Clause 33.9 the Engineer shall request the Contractor to do so within a further period of 28 days. If the Contractor fails to make such an application, the Engineer shall issue the Final Certificate of Payment for such amount as he deems correct.

### **33.11 Final Certificate of Payment Conclusive**

A Final Certificate of Payment shall be conclusive evidence of the value of

the Works, that the Works are in accordance with the Contract and that the Contractor has performed all his obligations under the Contract.

Payment of the amount certified in the Final Certificate of Payment shall be conclusive evidence that the Employer has performed all his obligations under the Contract.

A Final Certificate of Payment or payment shall not be conclusive:

- (a) to the extent that fraud or dishonesty relates to or affects any matter dealt with in the certificate, or
- (b) if any arbitration or court proceedings under the Contract have been commenced by either party before the expiry of 84 days after the issue of the Final Certificate of Payment.

## **Claims**

### **34.1 Procedure**

In any case where under these Conditions there are circumstances which the Contractor considers entitle him to claim additional payment, the Contractor shall:

- (a) if he intends to make any claim for additional payment give to the Engineer notice of his intention to make such claim within twenty eight (28) days after the said circumstances became known to the Contractor stating the reasons for his claim, and
- (b) as soon as reasonably practical after the date of such notice submit to the Engineer full and detailed particulars of his claim but not later than one hundred and eighty two (182) days after such notice unless otherwise agreed by the Engineer. In any event such particulars shall be submitted no later than the application for the Final Certificate of Payment. The Contractor shall thereafter promptly submit such further particulars as the Engineer may reasonably require to assess the validity of the claim.

### **34.2 Assessment**

When the Engineer has received full and detailed particulars of the Contractor's claim in accordance with Sub-Clause 34.1 and such further particulars as he may reasonably have required he shall after due consultation with the Employer and the Contractor determine whether the Contractor is entitled to additional payment and notify the parties accordingly.

The Engineer may reject any claim for additional payment which does not comply with the requirements of Sub-Clause 34.1.

**Foreign Currency and Rates of Exchange****35.1 Payment in Foreign Currencies**

Arrangements for payment in foreign currencies shall be as stated in the Preamble.

**35.2 Currency Restrictions**

The Employer shall reimburse the Contractor for any loss arising from:

- (a) currency restrictions, and
- (b) restrictions on the transfer of currency in which the Contractor is to be paid which are imposed by the government or authorized agency of the government of the country from which any payments under the Contract are to be made.

This Sub-Clause only applies to restrictions imposed after the date 28 days prior to the latest date for submission of tenders for the Works.

**35.3 Rates of Exchange**

Where the Contract provides for payment in Foreign Currency the rates of exchange between the currencies shall be fixed for the purpose of the Contract and shall be as stated in the Preamble.

If such rates of exchange are not stated in the Preamble the rates to be used shall be those quoted by the central bank of the country whose currency is to be sold 28 days or the nearest day thereto prior to the latest date for submission of tenders for the Works.

**Provisional Sums****36.1 Use of Provisional Sums**

A Provisional Sum shall only be used, in whole or in part in accordance with the Engineer's instructions.

The total sum paid to the Contractor shall include only such amounts in respect of work, supplies or services to which such Provisional Sums relate as the Engineer shall have instructed.

**36.2 Ordering Work against Provisional Sums**

In respect of every Provisional Sum the Engineer may after due consultation with the Employer and the Contractor order:

- (a) work to be executed, including goods, materials or services to be supplied by the Contractor. The value of such work executed, determined in accordance with Clause 31, shall be paid to the Contractor in accordance with Clause 33, and
- (b) goods and materials to be purchased by the Contractor, for which payment will be made in accordance with Sub-Clause 36.4.

### **36.3 Invoices and Receipts**

The Contractor shall, when required by the Engineer, produce quotations, invoices, vouchers and accounts or receipts in connection with expenditure in respect of Provisional Sums.

### **36.4 Payment against Provisional Sums**

For all work executed or goods, materials or services supplied or purchased by the Contractor under Sub-Clause 36.2(b), there shall be included in the sums paid to the Contractor:

- (a) the actual price paid or due to be paid by the Contractor, and
- (b) in respect of all other charges and profit, a percentage of the actual price paid or due to be paid. Such percentage shall be as stated in the Preamble.

## **Risk and Responsibility**

### **37.1 Allocation of Risk and Responsibility**

The Risks of loss of or damage to physical property and of death and personal injury which arise in consequence of the performance of the Contract shall be allocated between the Employer and the Contractor as follows:

- (a) the Employer: the Employer's Risks as specified in Sub-Clause 37.2
- (b) the Contractor: the Contractor's Risks as specified in Sub-Clause 37.3.

### **37.2 Employer's Risks**

The Employer's Risks are:

- (a) war and hostilities (whether war be declared or not), invasion, act of foreign enemies,
- (b) rebellion, revolution, insurrection, military or usurped power or civil war insofar as it relates to the country in which the Works are located or countries through which plant must be transported,

- (c) ionising radiation or contamination by radio-activity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radio-active toxic explosives or other hazardous properties of any explosive nuclear assembly or nuclear components thereof,
- (d) pressure waves caused by aircraft travelling at sonic or supersonic speed,
- (e) riot, commotion or disorder, unless solely restricted to the employees of the Contractor or of his Subcontractors,
- (f) use or occupation of the Works or any part thereof by the Employer,
- (g) fault, error, defect or omission in the design of any part of the Works by the Engineer, Employer or those for whom the Employer is responsible,
- (h) the use or occupation of the Site by the Works or any part thereof, or for the purposes of the Contract; or interference, whether temporary or permanent with any right of way, light, air or water or with any easement, wayleaves or right of a similar nature which is the inevitable result of the construction of the Works in accordance with the Contract,
- (i) the right of the Employer to construct the Works or any part thereof on, over, under, in or through any land,
- (j) damage (other than that resulting from the Contractor's method of construction) which is the inevitable result of the construction of the Works in accordance with the Contract,
- (k) the act, neglect or omission or breach of contract or of statutory duty of the Engineer, the Employer or other contractors engaged by the Employer or of their respective employees or agents,

and all risks which an experienced contractor could not have foreseen or, if foreseeable, against which measures to prevent loss, damage or injury from occurring could not reasonably have been taken by such contractor.

### **37.3 Contractor's Risks**

The Contractor's Risks are all risks other than those identified as the Employer's Risks.

## **Care of the Works and Passing of Risk**

### **38.1 Contractor's Responsibility for the Care of the Works**

The Contractor shall be responsible for the care of the Works or any Section thereof from the Commencement until the Risk Transfer Date applicable thereto under Sub-Clause 38.2.

The Contractor shall also be responsible for the care of any part of the Works upon which any outstanding work is being performed by the Contractor during the Defects Liability Period until completion of such outstanding work.

### **38.2 Risk Transfer Date**

The Risk Transfer Date in relation to the Works or a Section thereof is the earliest of either:

- (a) the date of issue of the Taking-Over Certificate, or
- (b) the date when the Engineer is deemed to have issued the Taking Certificate or the Works are deemed to have been taken over in accordance with Clause 29, or
- (c) the date of expiry of the notice of termination when the Contract is terminated by the Employer or the Contractor in accordance with these Conditions.

### **39.1 Passing of Risk of Loss of or Damage to the Works**

The risk of loss of or damage to the Works or any Section thereof shall pass from the Contractor to the Employer on the Risk Transfer Date applicable thereto.

### **39.2 Loss or Damage Before Risk Transfer Date**

Loss of or damage to the Works or any Section thereof occurring before the Risk Transfer Date shall:

- (a) to the extent caused by any of the Contractor's Risks, be made good forthwith by the Contractor at his own cost, and
- (b) to the extent caused by any of the Employer's Risks, be made good by the Contractor at the Employer's expense if so required by the Engineer within twenty eight (28) days after the occurrence of the loss or damage. The price for making good such loss and damage shall be in all circumstances reasonable and shall be agreed by the Employer and the Contractor, or in the absence of agreement, shall be fixed by arbitration under Clause 50.

### **39.3 Loss or Damage After Risk Transfer Date**

After the Risk Transfer Date, the Contractor's liability in respect of loss of or damage to any part of the Works shall, except in the case of Gross Misconduct, be limited:

- (a) to the fulfillment of the Contractor's obligations under Clause 30 in respect of defects therein, and
- (b) to making good forthwith loss or damage caused by the Contractor during the Defects Liability Period.

## **Damage to Property and Injury to Persons**

### **40.1 Contractor's Liability**

Except as provided under Sub-Clause 41.1, the Contractor shall be liable for and shall indemnify the Employer against all losses, expenses and claims in respect of any loss of or damage to physical property (other than the Works), death or personal injury occurring before the issue of the last Defects Liability Certificate to the extent caused by:

- (a) defective design, material or workmanship of the Contractor, or
- (b) negligence or breach of statutory duty of the Contractor, his Subcontractors or their respective employees and agents.

### **40.2 Employer's Liability**

The Employer shall be liable for and shall indemnify the Contractor against all losses, expenses or claims in respect of loss of or damage to any physical property or of death or personal injury whenever occurring, to the extent caused by any of the Employer's Risks.

### **41.1 Accidents**

The Contractor shall be liable for and shall indemnify the Employer against all losses, expenses or claims arising in connection with the death of or injury to any person employed by the Contractor or his Subcontractors for the purposes of the Works, unless caused by any acts or defaults of the Engineer, the Employer, or other contractors engaged by the Employer or by their respective employees or agents. In the latter cases the Employer shall be liable for and shall indemnify the Contractor against all losses, expenses and claims arising in connection therewith.

## **Limitations of Liability**

### **42.1 Liability for Indirect or Consequential Damage**

Neither party shall be liable to the other for any loss of profit, loss of use, loss of production, loss of contracts or for any other indirect or

consequential damage that may be suffered by the other, except:

- (a) as expressly provided in Clause 27, and
- (b) those provisions of these Conditions whereby the Contractor is expressly entitled to receive profit.

#### **42.2 Maximum Liability**

The liability of the Contractor to the Employer under these Conditions shall in no case exceed the sum stated in the Preamble or, if no such sum is stated, the Contract Price.

#### **42.3 Liability after Expiration of Defects Liability Period**

The Contractor shall have no liability to the Employer for any loss of or damage to the Employer's physical property which occurs after the expiration of the Defects Liability Period unless caused by Gross Misconduct of the Contractor.

#### **42.4 Exclusive Remedies**

The Employer and the Contractor intend that their respective rights, obligations and liabilities as provided for in these Conditions shall alone govern their rights under the Contract and in relation to the Works.

Accordingly, the remedies provided under the contract in respect of or in consequence of:

- (a) any breach of contract, or
- (b) any negligent act or omission, or
- (c) death or personal injury, or
- (d) loss or damage to any property

are, save in the case of Gross Misconduct, to be to the exclusion of any other remedy that either may have against the other under the law governing the Contract or otherwise.

#### **42.5 Mitigation of Loss of Damage**

In all cases the party claiming a breach of Contract or a right to be indemnified in accordance with the Contract shall be obliged to take all reasonable measures to mitigate loss or damage which has occurred or may occur.



**42.6 Foreseen Damage**

Where either the Employer or the Contractor is liable in damages to the other these shall not exceed the damage which the party in default could reasonably have foreseen at the date of the Contract.

**Insurance****43.1 The Works**

The Contractor shall insure the Works in the joint names of the Contractor and the Employer to their full replacement value with deductible limits not exceeding those stated in the Preamble.

- (a) from the Commencement Date until the Risk Transfer Date against any loss or damage caused by any of the Contractor's Risks and any other risks specified in the Preamble, and
- (b) during the Defects Liability period against any loss or damage which is caused either:
  - (i) by the Contractor in completing any outstanding work or complying with his obligations under Clause 30, or
  - (ii) by any of the Contractor's Risks which occurred prior to the Risks Transfer Date.

**43.2 Contractor's Equipment**

The Contractor shall insure Contractor's Equipment for its full replacement value whilst in transit to the Site, from commencement of loading until completion of unloading at the Site and while on the Site against all loss or damage caused by any of the Contractor's Risks.

**43.3 Third Party Liability**

The Contractor shall insure against liability to third parties for any death or personal injury and loss of or damage to any physical property arising out of the performance of the Contract and occurring before the issue of the last Defects Liability Certificate.

Such insurance shall be effected before the Contractor begins any work on the Site. The insurance shall be for not less than the amount specified in the Preamble.

**43.4 Employees**

The Contractor shall insure and maintain insurance against his liability under Sub-Clause 41.1.

**43.5 General Requirements of Insurance Policies**

The Contractor shall:

- (a) whenever required by the Employer produce the policies or certificates of any insurance which he is required to effect under the Contract together with receipts for the premiums,
- (b) effect all insurances for which he is responsible with an insurer and in terms approved by the Employer,
- (c) make no material alterations to the terms of any insurance without the Employer's approval. If an insurer makes any material alteration to the terms the Contractor shall forthwith notify the Employer, and
- (d) in all respect comply with any conditions stipulated in the insurance policies which he is required to place under the Contract.

**43.6 Permitted Exclusions from Insurance Policies**

The insurance cover affected by the Contractor may exclude any of the following:

- (a) the cost of making good any part of the Works which is defective or otherwise does not comply with the Contract provided that it does not exclude the cost of making good any loss or damage to any other part of the Works attributable to such defect or non-compliance,
- (b) indirect or consequential loss of damage including any reductions in the Contract Price for delay,
- (c) wear and tear, shortages and theft, or
- (d) risks relating to vehicles for which third party or other insurance is required by law.

**43.7 Remedies on the Contractor's Failure to Insure**

If the Contractor fails to produce evidence of insurance cover as stated in Sub-Clause 43.5 (a) then the Employer may effect and keep in force such insurance. Premiums paid by the Employer for this purpose shall be deducted from the Contract Price.

**43.8 Amounts not Recovered**

Any amounts not recovered from the insurers shall be borne by the Employer or Contractor in accordance with their responsibilities under Clause 37.

**Force Majeure**

**44.1 Definition of Force Majeure**

Force Majeure means any circumstances beyond the control of the parties, including but not limited to:

- (a) war and other hostilities, (whether war be declared or not), invasion, act of foreign enemies, mobilisation, requisition or embargo,
- (b) ionising radiation or contamination by radio-activity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel, radio-active toxic explosives, or other hazardous properties of any explosive nuclear assembly or nuclear components thereof,
- (c) rebellion, revolution, insurrection, military or usurped power and civil war,
- (d) riot, commotion or disorder, except where solely restricted to employees of the Contractor.

**44.2 Effect of Force Majeure**

Neither party shall be considered to be in default or in breach of his obligations under the Contract to the extent that performance of such obligations is prevented by any circumstances of Force Majeure which arise after the date of the Letter of Acceptance or the date when the Contract becomes effective, whichever is the earlier.

**44.3 Notice of Occurrence**

If either party considers that any circumstances of Force Majeure have occurred which may affect performance of his obligations he shall promptly notify the other party and the Engineer thereof.

**44.4 Performance to Continue**

Upon the occurrence of any circumstances of Force Majeure the Contractor shall endeavour to continue to perform his obligations under the Contract so far as reasonably practicable. The Contractor shall notify the Engineer of the steps he proposes to take including any reasonable alternative means for performance which is not prevented by Force Majeure. The Contractor shall not take any such steps unless directed so to do by the Engineer.

**44.5 Additional Costs caused by Force Majeure**

If the Contractor incurs additional costs in complying with the Engineer's directions under Sub-Clause 44.4, the amount thereof shall be certified by the Engineer and added to the Contract Price.

**44.6 Damage Caused by Force Majeure**

If in consequence of Force Majeure the Works shall suffer loss or damage the Contractor shall be entitled to have the value of the work done, without regard to the loss or damage that has occurred, included in a Certificate of Payment.

**44.7 Termination in Consequence of Force Majeure**

If circumstances of Force Majeure have occurred and shall continue for a period of one hundred and eighty two (182) days then, notwithstanding that the Contractor may by reason thereof have been granted an extension of Time for Completion of the Works, either party shall be entitled to serve upon the other twenty eight (28) days' notice to terminate the Contract. If at the expiry of the period of twenty eight (28) days Force Majeure shall still continue the Contract shall terminate.

**44.8 Payment on Termination for Force Majeure**

If the Contract is terminated under Sub-Clause 44.7 the Contractor shall be paid the value of the work done.

The contractor shall also be entitled to receive:

- (a) the amounts payable in respect of any preliminary items so far as the work or service comprised therein has been carried out and a proper proportion of any such item in which the work or service comprised has only been partially carried out,
- (b) the cost of materials or goods ordered for the Works or for use in connection with the Works which have been delivered to the Contractor or of which the Contractor is legally liable to accept delivery. Such materials or goods shall become the property of and be at the risk of the Employer when paid for by the Employer and the Contractor shall place the same at the Employer's disposal,
- (c) the amount of any other expenditure which in the circumstances was reasonably incurred by the Contractor in the expectation of completing the whole of the Works,
- (d) the reasonable cost of removal of Contractor's Equipment from the Site and the return thereof to the Contractor's works in his country or to any other destination at no greater cost, and
- (e) the reasonable cost of repatriation of the Contractor's staff and workmen employed wholly in connection with the Works at the date of such termination.

**44.9 Release from Performance**

If circumstances of Force Majeure occur and in consequence thereof under the law governing the Contract the parties are released from further performance of the Contract, the sum payable by the Employer to the Contractor shall be the same as that which would have been payable under Sub-Clause 44.8 if the Contract had been terminated under Sub-Clause 44.7.

**44.10 Force Majeure Affecting Engineer's Duties**

The provisions of Clause 44 shall also apply in circumstances where the Engineer is prevented from performing any of his duties under the Contract by reason of Force Majeure.

**Default****45.1 Notice of Default**

If the Contractor is not executing the Works in accordance with the Contract or is neglecting to perform his obligations thereunder so as seriously to affect the carrying out of the Works, the Engineer may give notice to the Contractor requiring him to make good such failure or neglect.

**45.2 Contractor's Default**

If the Contractor:

- (a) has failed to comply within a reasonable time with a notice under Sub-Clause 45.1, or
- (b) assigns the Contract or subcontracts the whole of the Works without the Employer's written consent, or
- (c) becomes bankrupt or insolvent, has a receiving order made against him or compounds with his creditors, or carries on business under a receiver, trustee or manager for the benefit of his creditors or goes into liquidation.

The Employer may, after having given seven (7) days' notice to the Contractor, terminate the Contract and expel the Contractor from the Site.

Any such expulsion and termination shall be without prejudice to any other rights or powers of the Employer, the Engineer or the Contractor under the Contract.

The Employer may upon such termination complete the Works himself or by any other contractor.

**45.3 Valuation at Date of Termination**

The Engineer shall, as soon as possible after such termination, certify the value of the Works and all sums then due to the Contractor as at the date of termination in accordance with Clause 33.

#### **45.4 Payment after Termination**

The Employer shall not be liable to make any further payments to the Contractor until the Works have been completed. When the Works are so complete, the Employers shall be entitled to recover from the Contractor the extra costs, if any, of completing the Works after allowing for any sum due to the Contractor under Sub-Clause 45.3. If there is no such extra cost the Employer shall pay any balance due to the Contractor.

#### **45.5 Effect on Liability for Delay**

The Contractor's liability under Clause 27 shall immediately cease when the Employer expels him from the Site without prejudice to any liability thereunder that may have already occurred.

#### **46.1 Employer's Default**

The Contractor may, by giving fourteen (14) days' notice to the Employer and the Engineer, terminate the Contract if the Employer:

- (a) fails to pay the Contractor the amount due under any certificate of the Engineer within twenty eight (28) days after the amount became payable, or
- (b) interferes with or obstructs the issue of any certificate of the Engineer, or
- (c) becomes bankrupt or insolvent, has a receiving order made against him, compounds with his creditors, or carries on business under a receiver, trustee or manager for the benefit of his creditors or goes into liquidation, or goes into liquidation, or
- (d) consistently fails to meet his contractual obligations, or
- (e) appoints, a person to act with or in replacement of the Engineer without the Contractor's consent.

Any such termination shall be without prejudice to any other rights of the Contractor under the Contract.

#### **46.2 Removal of Contractor's Equipment**

On such termination, the Contractor shall be entitled to remove immediately all Contractor's Equipment which is on the Site.

**46.3 Payment on Termination for Employer's Default**

In the event of such termination the Employer shall pay the Contractor an amount calculated in accordance with Sub-Clause 44.8.

The Employer shall pay in addition the amount of any loss or damage, including loss of profit which the Contractor may have suffered in consequence of termination. The additional amount shall, however, not exceed the limit specified in the Preamble.

**Change in Cost and Legislation****47.1 Labour, Materials and Transport**

Where the Contract Price is to be adjusted for changes in the cost of labour, materials, transport or other costs of execution of the Works, the method for calculating such adjustment shall be specified in the Preamble.

When calculating the adjustment no account shall be taken of any increased cost which results from the Contractor's default or negligence.

**47.2 Statutory and Other Regulations**

The Contract Price shall be adjusted to take account of any increase or decrease in cost resulting from changes in legislation of the country where the Site is located or in its generally accepted interpretation.

Legislation means any law, order, regulation or bye-law having the force of law, which affects the Contractor in the performance of his obligations under the Contract, made after the date 28 days prior to the latest date for submission of tenders for the Works.

The Engineer shall certify the amount of the resulting increase or decrease in cost, which shall be added to or deducted from the Contract Price.

**Customs****48.1 Customs and Import Duties**

Unless otherwise stated in Part II the Employer shall pay all customs, import duties and taxes in consequence of the importation of Plant. If the Contractor is required to pay such customs, import duties and taxes, the Employer shall reimburse the amount thereof.

**48.2 Clearance through Customs**

The Employer shall assist the Contractor in obtaining clearance through the customs of all Plant and Contractor's Equipment and in procuring any necessary government consent to the re-export of Contractor's Equipment

when it is removed from the Site.

## **Notices**

### **49.1 Notices to Contractor**

All certificates, notices or written orders to be given to the Contractor by the Employer or the Engineer under these Conditions shall be sent by airmail post, cable, telex or facsimile transmission to or left at the Contractor's principal place of business or such other address as the Contractor shall nominate for that purpose, or may be handed over to the Contractor's representative.

### **49.2 Notice to Employer and Engineer**

Any notice to be given to the Employer or to the Engineer under these Conditions shall be sent by airmail post, cable, telex or facsimile transmission to or left at the respective addresses nominated for that purpose in the Preamble, or handed over to the Engineer's or the Employer's representative authorised to receive it.

### **49.3 Minutes of Meetings**

Instructions or notices to the Contractor and notices from the Contractor to the Engineer or the Employer recorded in a minute or protocol signed by the authorized representatives of the giver and recipient of such notice or instruction shall be valid notice or instruction for the purposes of the Contract.

## **Disputes and Arbitration**

### **50.1 Disputes concerning Engineer's Decisions**

If either party is dissatisfied with a decision or instruction of the Engineer as confirmed, reversed or varied in accordance with Clause 2 he may refer the matter to arbitration pursuant to Sub-Clause 50.2.

Unless the dissatisfied party has notified the other party and the Engineer within fifty six (56) days of such decision or instruction of his intention to refer the matter to arbitration, he shall be deemed to have accepted the decision as final.

Reference to arbitration shall not relieve the Contractor of his obligation to proceed with the Works in accordance with the Engineer's decision or instruction, nor relieve the Employer of any of his obligations under the



Contract.

The Contractor shall in any such arbitration be at liberty to rely on reasons additional to the reasons stated in the notice given under Sub-Clause 2.7.

## **50.2 Arbitration**

If at any time any question, dispute or difference shall arise between the Employer and the Contractor in connection with or arising out of the Contract or the carrying out of the Works either party shall be entitled to refer the matter to be finally settled by arbitration in accordance with the Rules of Conciliation and Arbitration of the International Chamber of Commerce by one or more arbitrators appointed in accordance with those Rules, or by arbitration in accordance with such other rules as are specified in Part II.

The Arbitrators(s) shall have full power to open up, review and revise:

- (a) any decision or instruction of the Engineer referred to arbitration pursuant to Sub-Clause 50.1, and
- (b) any certificate of the Engineer related to the dispute.

## **50.3 Works to Continue**

Performance of the Contract shall continue during arbitration proceedings unless the Employer shall order suspension. If any such suspension is ordered the reasonable costs incurred by the Contractor and occasioned thereby shall be added to the Contract Price.

No payments due or payable by the Employer shall be withheld on account of pending reference to arbitration.

## **50.4 Time Limit for Arbitration**

Formal notice of arbitration must be given to the other party, and where required to the appropriate arbitration body, no later than eighty four (84) days after the issue of the Final Certificate of Payment

## **Law and Procedure**

### **51.1 Applicable Law**

The law which is to apply to the Contract and under which the Contract is to be construed is stated in the Preamble.

### **51.2 Procedural Law**

The law governing the procedure and administration of any arbitration instituted pursuant to Clause 50 is stated in the Preamble.

**51.3 Language**

The language and place of the arbitration are stated in the Preamble.

**EDITORIAL AMENDMENTS**

Following publication of the Third Edition of the Conditions of Contract for Electrical and Mechanical Works in 1987, a number of editorial amendments were agreed by FIDIC. The amendments have been incorporated during reprinting and the list below clarifies the differences between this copy and the original document.

|                    |                                                                                                             |
|--------------------|-------------------------------------------------------------------------------------------------------------|
| Page 1             | The following additional text has been inserted:                                                            |
| Commencement date  | Sub-Clause 1.1.1.(i)<br>The date for commencement of the Works is<br><hr/>                                  |
| Page 2             | Sub-Clause 36.4(b) was previously Sub-Clause 36.4<br>The word 'Sums' following 'shall be' has been deleted. |
| Page 8             | Sub-Clause 2.7. The missing letter 'D' has been inserted in 'Disputing' (margin note.)                      |
| Page 33            | Sub-Clause 44.8(b). The word 'Contractor' on the last line was previously 'Contract'.                       |
| Page 35            | Sub-Clause 49.3. The word 'or' between 'minute' and 'protocol' was previously 'of'.                         |
| Index, page (i)    | The words 'Adverse physical conditions and artificial obstructions' have been deleted.                      |
| Index, page (v)    | The word 'adverse' has been deleted after 'Physical conditions'.                                            |
| Contract Agreement | The word 'Agreement' in the title has been Capitalized.                                                     |
| Line 4             | Inverted commas have been inserted after 'Employer'.                                                        |
| Line 6             | Inverted commas have been inserted before the word 'the' and deleted before the word 'Contractor'.          |
| Line 7             | The comma following the word 'executed' has been deleted.                                                   |
| Line 15            | Inverted commas have been inserted before the word 'the' and deleted after the word 'the'.                  |
| Item 4, line 2     | The word 'defects' was previously 'defect'.                                                                 |

- Item 4, line 3            The words 'become' was previously 'be come'.
- Item 5, line 1            The words 'and statutes or constitutions' have been inserted after the word 'laws'.
- Item 5, line 2            The words 'by their duly authorized signatories' have been inserted after the word 'hereof'.
- Item 5                    The remaining text of the original document has been deleted and is replaced by:  
'Binding    Signatures(s)    on    behalf    of    the    Employer  
\_\_\_\_\_,  
and  
'Binding    Signatures(s)    on    behalf    of    the    Contractor  
\_\_\_\_\_'

## **PART-II: PARTICULAR CONDITIONS OF CONTRACT**

### **CONTENTS**

- 1.1 Definitions
- 1.6 Cost, Overhead Charges and Profit
- 2.1 Engineer's Duties
- 2.6 Confirmation in Writing
- 2.7 Disputing Engineer's Decisions and Instructions
- 2.8 Replacement of Engineer
- 2.9 Engineer Not Liable
- 4.2 No Contractual Relation between Sub contractor and the Employer
- 5.3 Priority of Contract Documents
- 5.4 Documents Mutually Explanatory
- 6.2 Consequences of Dis-approval of Contractor's Drawings
- 6.6 Operation and Maintenance Manuals
- 6.9 Manufacturing Drawings
- 6.10 "As Built" Drawings
- 8.1 General Obligations
- 10.1 Performance Security
- 10.3 Claims under Performance Security
- 10.4 Performance Security Binding on Variations and Changes
- 12.1 Programme to be Furnished
- 12.4 Monthly Progress Report
- 12.5 Daily Job Record
- 13.1 Contractor's Representative
- 13.3 Language Ability of Superintending Staff of Contractor
- 13.4 Employment of Local Personnel
- 14.1 Contractor's Equipment
- 14.2 Safety Precautions
- 14.3 Electricity, Water and Gas
- 14.4 Employer's Equipment
- 14.8 Information for Import Permits and Licenses
- 15.2 Compliance with Laws
- 16.4 Photographs of Works and Advertisement Prohibited
- 16.5 Training of Employer's Staff
- 17.4 Consents and Way Leaves
- 17.5 Import Permits and Licenses
- 18.1 Engagement of Labour

18.5 Employment of Persons in the Service of Others

18.6 Alcoholic Liquor or Drugs

### **CONTENTS**

18.7 Arms and Ammunition

18.8 Festivals and Religious Customs

18.9 Disorderly Conduct

18.10 Records of Safety and Health

18.11 Reporting of Accidents

18.12 Compliance by Sub-Contractors

19.1 Manner of Execution

19.3 Uncovering Work

19.4 Use of Pakistani Materials

24.1 Cost of Suspension

24.4 Resumption of Work

25.1 Time for Completion

26.1 Extension of Time for Completion

26.3 Earlier Completion

26.4 Rate of Progress

27.1 Delay in Completion

28.7 Consequences of Failure to pass the Tests on Completion

30.4 Extension of Defects Liability Period

30.5 Failure to Remedy Defects

30.13 Unfulfilled Obligations

31.1 Engineer's Right to Vary

31.5 Record of Costs

31.6 Daywork under Variation Order

31.7 Value Engineering

33.1 Terms of Payment

33.1.1 Retention of Payment

33.1.2 Payment Where Taking Over Certificate Issued  
to Section or Portion of Works

33.3 Method of Application

33.5 Payment

33.6 Delayed Payment

33.8 Payment by Measurement

33.12 Withholding of Payment

35.1 Payment in Foreign Currencies

35.2 Currency Restrictions

- 35.3 Rates of Exchange
- 36.4 Payment Against Provisional Sums
- 37.2 Employer's Risks

## **CONTENTS**

- 39.2 Loss or Damage Before Risk Transfer Date
- 39.4 Duty to Minimize Delay
- 40.2 Employer's Liability
- 42.2 Maximum Liability
- 42.6 Foreseen Damage
- 43.1 The Works (Insurance)
- 43.2 Contractor's Equipment
- 43.3 Third Party Liability (Insurance)
- 43.7 Remedies on the Contractor's Failure to Insure
- 43.9 Currency of Insurance
- 43.10 Contractor to Notify
- 43.11 Procurement of Insurance Policies
- 44.6 Damage Caused by Force Majeure
- 44.8 Payment on Termination for Force Majeure
- 44.10 Force Majeure Affecting Engineer's Duties
- 45.2 Contractor's Default
- 45.6 Integrity Pact
- 46.1 Employer's Default
- 46.3 Payment on Termination for Employer's Default
- 47.1 Labour, Materials and Transport
- 48.1 Customs and Import Duties
- 48.3 Port Charges and Port Congestion
- 49.1 Notice to Contractor
- 50. Disputes & Arbitration

## PART-II: PARTICULAR CONDITIONS OF CONTRACT

### 8.1.8 Definitions

|            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1.1</b> | <b><u>Definitions</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 1.1.1      | The text of <u>Sub-Clause 1.1.1</u> is deleted and substituted by the following:<br><br>“Commencement Date” means the date specified in the Preamble to Conditions of Contract.                                                                                                                                                                                                                                                                                                       |
| 1.1.2      | The text of <u>Sub-Clause 1.1.2</u> is deleted and substituted by the following:<br><br>“Conditions” means the Preamble to Conditions of Contract, General Conditions of Contract and Particular Conditions of Contract.                                                                                                                                                                                                                                                              |
| 1.1.3      | At the end of Sub-Clause the following is added:<br><br>“Any subsequent document mutually agreed and signed by the Employer and the Contractor, shall be the part of the Contract.”                                                                                                                                                                                                                                                                                                   |
| 1.1.5      | The text of <u>Sub-Clause 1.1.5</u> is deleted and substituted by the following:<br><br>“Contract Price” means the sum stated in the Letter of Acceptance as payable to the Contractor for the execution and completion of the Works subject to such additions thereto or deductions therefrom as may be made under the provisions hereinafter contained and remedying of any defects therein in accordance with the provisions of the Contract.”                                     |
| 1.1.7      | The word “technical data” is added before the word “samples” in first line.                                                                                                                                                                                                                                                                                                                                                                                                           |
| 1.1.11     | The Defects Liability Period is the period mentioned in the Preamble to Conditions of Contract.                                                                                                                                                                                                                                                                                                                                                                                       |
| 1.1.15     | The following is added at the end of Sub-Clause:<br><br>“or any other competent person appointed by the Employer as his replacement.”<br><br>For the purpose of this EPC Contract, based on two party agreement, the term Engineer is construed as Project Manager/Engineer. The Project Manager is a Person appointed by the Employer to act on behalf of the Employer for the purpose of the Contract whereas the Engineer has the same meaning as defined in GCC Sub-Clause 1.1.15 |
| 1.1.15     | The words “Project Manager/” are added at the start of subclause.                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 1.1.23     | The following paragraph is added:<br><br>The word “Goods” is synonymous with “Plant.”                                                                                                                                                                                                                                                                                                                                                                                                 |



|        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.1.27 | The text of <u>Sub-Clause 1.1.27</u> is deleted and substituted by the following:<br><br>“Schedule of Prices” means the completed and priced Schedule of Prices, or any part or individual schedule thereof, submitted by the Contractor with his Bid or revised and mutually agreed and forming a part of the Contract documents.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 1.1.33 | The word “Tender” is synonymous with the word “Bid” and the word “Tender Documents” with the word “Bidding Documents”.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|        | The following Sub-clauses are added:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 1.1.38 | <u>“Month”</u> means calendar month according to Gregorian calendar.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 1.1.39 | <u>“Operation and Maintenance Manuals”</u> has the meaning described in Sub-Clause 6.6.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 1.1.40 | <u>“Party”</u> means the Employer or the Contractor, as the context requires.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 1.1.41 | <u>“Completion”</u> means that the Plant (or a specific part thereof where specific parts are specified in the Contract) have been completed operationally and structurally and put in a tight and clean condition, and that the Plant or specific part thereof has passed Test on Completion as provided in GCC Clause 28.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1.1.42 | <u>“Country of Origin”</u> means All countries of the World with whom Islamic Republic of Pakistan has commercial / trade relations except India, Israel and the countries upon which international sanctions are imposed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 1.1.43 | The word “Part II” stated in FIDIC Conditions of Contract is synonymous with the word “Particular Conditions of Contract                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 1.1.44 | <u>“EPC/Turnkey Basis”</u> means where the Contractor takes total responsibility for design and execution of the project with little involvement of the Employer. Under the usual arrangements of turnkey projects, the contractor carries out all the Engineering, Procurement and Construction (EPC) providing a fully equipped facility ready for operation.<br><br>Total responsibility of the Contractor include; but not limited to; design, supply, installation and commissioning of all mechanical and electrical equipment, civil and other works necessary for the completion and commercial operation of the Plant and shall include all such items of Plant and equipment or work, whether mentioned in the Specifications, Bid drawings, Schedule of Prices or not, which are required to make the Plant operationally complete in accordance with the guarantees prescribed under the Contract. |
| 1.1.45 | <u>“Warranty Certificate”</u> means the certificate against specified goods/equipment, to be issued by the Contractor that the goods/equipment supplied under the Contract are new, unused and incorporate all recent improvements in design and materials unless provided otherwise in the Contract and that the Contractor will be responsible for making good or replacing any defective goods/equipment during the Defect Liability Period or any extended period required under conditions of Contract.                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1.3    | <b>Interpretation</b><br>Text of Clause GCC 1.3 is substituted with following:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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| <p>“1.3.1 In the Contract, except where the context requires otherwise,</p> <ul style="list-style-type: none"> <li>(a) words indicating one gender include all genders;</li> <li>(b) words indicating the singular also include the plural and words indicating the plural also include the singular;</li> <li>(c) provisions including the word “agree,” “agreed,” or “agreement” require the agreement to be record in writing; and</li> <li>(d) “written” or “in writing” means handwritten, typewritten, printed or electronically made, and resulting in a permanent record.</li> </ul> <p>1.3.2 Incoterms</p> <p>Unless inconsistent with any provision of the Contract, the meaning of any trade term and the rights and obligations of parties thereunder shall be as prescribed by Incoterms.</p> <p>“Incoterms” means international rules for interpreting trade terms published by the International Chamber of Commerce (latest edition), 38 Cours Albert 1<sup>er</sup>, 75008 Paris, France.</p> <p>1.3.3 <u>Entire Agreement</u></p> <p>The Contract constitutes the entire agreement between the Employer and Contractor with respect to the subject matter of Contract and supersedes all communications, negotiations, and agreements (whether written or oral) of parties with respect thereto made prior to the date of Contract.</p> <p>1.3.4 <u>Amendment</u></p> <p>No amendment or other variation of the Contract shall be effective unless it is in writing, is dated, expressly refers to the Contract, and is signed by a duly authorized representative of each party hereto.</p> <p>1.3.5 <u>Independent Contractor</u></p> <p>The Contractor shall be an independent contractor performing the Contract. The Contract does not create any agency, partnership, joint venture, or other joint relationship between the parties hereto. Subject to the provisions of the Contract, the Contractor shall be solely responsible for the manner in which the Contract is performed. All employees, representatives, or Subcontractors engaged by the Contractor in connection with the performance of the Contract shall be under the complete control of the Contractor and shall not be deemed to be employees of the Employer, and nothing contained in the Contract or in any subcontract awarded by the Contractor shall be construed to create any contractual relationship between any such employees, representatives, or Subcontractors and the Employer.</p> <p>1.3.6 <u>Non-Waiver</u></p> <ul style="list-style-type: none"> <li>(a) Subject to GCC Subclause 1.3.6 (b) below, no relaxation, forbearance, delay, or indulgence by either party in enforcing any of the terms</li> </ul> |
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|          | <p>and conditions of the Contract or the granting of time by either party to the other shall prejudice, affect, or restrict the rights of that party under the Contract, nor shall any waiver by either party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.</p> <p>(b) Any waiver of a party's rights, powers, or remedies under the Contract must be in writing, must be dated, and signed by an authorized representative of the party granting such waiver, and must specify the right and the extent to which it is being waived.</p> <p>1.3.7 <u>Severability</u><br/>If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity, or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract.</p> <p>1.3.8 <u>Country of Origin</u><br/>"Origin" means the place where the plant and component parts thereof are mined, grown, produced, or manufactured, and from which the services are provided. Plant components are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that is substantially in its basic characteristics or in purpose or utility from its components.</p> |
| <b>2</b> | <b><u>Engineer and Engineer's Representative</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 2.1      | <p><b><u>Engineer's Duties</u></b></p> <p>Text of Clause GCC 2.1 is substituted with following:</p> <p>"The Project Manager/Engineer shall carry out the duties specified in the Contract.</p> <p>The Project Manager/Engineer may exercise the authority attributable to the Project Manager/Engineer as specified in or necessarily to be implied from the Contract. The Project Manager/Engineer is required to obtain the specific approval of the Employer before carrying out his duties in accordance with the following Clauses of General Conditions of Contract (GCC):</p> <ul style="list-style-type: none"> <li>(a) approval of Subcontractor under Sub-Clause 4.1,</li> <li>(b) certifying additional costs under Sub-Clauses 11.3,</li> <li>(c) certifying any cost under Sub-Clause 14.6,</li> <li>(d) approval of extension of time under Clause 26,</li> <li>(e) issuing a Taking-Over Certificate under Sub-Clause 29,</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                    |

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|     | <p>(f) issuing a Defects Liability Certificate under Sub-Clause 30.11,</p> <p>(g) issuing a Variation Order- under Clause 31,</p> <p>(h) fixing rates or prices under Clauses 31 and 34,</p> <p>(i) certifying additional costs under Sub-Clause 44.5 and</p> <p>(j) certifying additional costs under Sub-Clause 47.2;</p> <p>(k) Continuous monitoring, verification/inspection/recounting of materials received at site.</p> <p>(l) Coordinate for clearance of right of ways.</p> <p>(m) Management of Project Execution Plan as per Time for Completion under sub-Clause 25.1 or any determinations of any extensions under sub-clause 26.1</p> <p>Except for such variations pursuant to Sub-Clause 31.1 of the GCC which may be necessary in an emergency affecting safety of life, the Works or of adjoining property.</p> <p>Except as expressly stated in the Contract, the Project Manager/Engineer shall have no authority to relieve the Contractor of any of his obligations under the Contract."</p> |
| 2.6 | <p><b><u>Confirmation in Writing</u></b></p> <p>(i) In line 3 after the words "undue delay" the following is added:<br/>"but not after the number of days mentioned in the Preamble to Conditions of Contract from the instruction or decision."</p> <p>(ii) At the end of Sub-Clause 2.6, the following is added:<br/>"The Engineer shall confirm or otherwise within the period mentioned in the Preamble to Conditions of Contract from the receipt of requirement(s) from the Contractor."</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 2.7 | <p><b><u>Disputing Engineer's Decisions and Instructions</u></b></p> <p>The following text is deleted:<br/>"If either party ..... In accordance with the Contract."</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 2.8 | <p><b><u>Replacement of Engineer</u></b></p> <p>The text of Sub-Clause is deleted and substituted by the following:</p> <p>"The Employer may from time to time appoint some other person as the Project Manager/Engineer in place of the person previously so appointed, and shall give notice of the name of such other person to the Contractor without delay. No such appointment shall be made at such a time or in such a manner as to impede the progress of work on the Plant."</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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| 2.9 | <p>Sub-Clause 2.9 is added as follows:</p> <p><u>Project Manager/ Engineer Not Liable</u></p> <p>“Approval, reviews and inspection by the Project Manager/Engineer of any part of the Works does not relieve the Contractor from his sole responsibility and liability for the supply of remaining materials and equipment for the Works and parts thereof and complete the remaining erection works and testing and commissioning in accordance with the Contract and neither the Project Manager/Engineer’s authority to act nor any decision made by him in good faith as provided for under this Contract whether to exercise or not to exercise such authority shall give rise to any duty or responsibility of the Project Manager/Engineer to the Contractor, any Subcontractor, any of their representatives or employees or any other person performing any of the Works. However the Contractor shall be compensated if any loss/damage is occurred due to the decision of the Project Manager/Engineer.”</p>                                                                                                                                                                                                                                                                                      |
| 3.1 | <p><b>Assignment</b></p> <p><u>First sentence of sub-clause is replaced with following:</u></p> <p>“The Contractor shall not assign the Contract or any part thereof, or any right, benefit, obligation or interest therein or thereunder without written consent from the Employer.”</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4.1 | <p><b>Subcontracting</b></p> <p>Text of sub-clause is deleted in its entirety and replaced with following:</p> <p>“4.1.1 The Schedule E (Form SUBCON) to the Contract Agreement specifies major items of plant and services and a list of approved Subcontractors against each item, including manufacturers. Insofar as no Subcontractors are listed against any such item, the Contractor shall prepare a list of Subcontractors for such item for inclusion in such list. The Contractor may from time to time propose any addition to or deletion from any such list. The Contractor shall submit any such list or any modification thereto to the Employer for its approval in sufficient time so as not to impede the progress of work on the Works. Such approval by the Employer for any of the Subcontractors shall not relieve the Contractor from any of its obligations, duties, or responsibilities under the Contract.</p> <p>4.1.2 The Contractor shall select and employ its Subcontractors for such major items from those listed in the lists referred to in GCC Subclause 4.1.1.</p> <p>4.1.3 Notwithstanding above, for items &amp; parts of work not specified in Schedule E to the Contract Agreement, the Contractor shall employ subcontractors with prior approval of Employer.</p> |

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|     | <u>GCC Subclauses 4.2 to 4.4 are added as follows:</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 4.2 | <p><b><u>No Contractual Relation between Subcontractor and the Employer</u></b></p> <p>Nothing contained in the Contract Documents shall create any contractual relation between any Subcontractor and the Employer. However, each subcontract shall include provisions which would entitle the Employer to require the sub-contract to be assigned to the Employer under GCC 4.3 (if and when applicable), or in event of termination by the Employer under GCC 45.2.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4.3 | <p>If a Sub-contractor's obligations extend beyond the expiry date of the relevant Defects Liability Period and the Project Manager, prior to that date, instructs the Contractor to assign the benefits of such obligations to the Employer, then the Contractor shall do so.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4.4 | <p>The Contractor shall not assign any manufacturing work for any Plant or part thereof to any firm other than the Manufacturer(s) named in his Bid and has been accepted by the Employer. In unavoidable circumstance, prior approval of the Employer shall be obtained by the Contractor for assigning any manufacturing work to a manufacturer not named as such in the Contract in Schedule E (Form SUBCON). Nothing contained in the Contract shall create any contractual relationship or professional obligation between any manufacturer and Employer. Onus of any discrepancy in the manufacture shall be on the Contractor.</p>                                                                                                                                                                                                                                                                                                                                                                                         |
| 5.3 | <p><b><u>Priority of Contract Documents</u></b></p> <p>Text of Sub-Clause 5.3 is deleted and substituted by the following:</p> <p>"Unless otherwise provided in the Contract, the priority of the Contract Documents shall be as follows:</p> <ol style="list-style-type: none"> <li>1. The Contract Agreement (if completed)</li> <li>2. The Letter of Acceptance</li> <li>3. The completed Letters of Technical and Price Bids</li> <li>4. The priced Schedule of Prices</li> <li>5. Preamble to Conditions of Contract</li> <li>6. The Particular Conditions of Contract</li> <li>7. The General Conditions of Contract</li> <li>8. The Specifications (Technical Provisions, Special Provisions and all relevant NGC specifications)</li> <li>9. The completed Schedules to Bid (A to L)</li> <li>10. The Drawings</li> <li>11. Any other document forming part of the Contract.</li> </ol> <p>However, the Employer may modify the order of precedence of above listed documents during formation of Contract Agreement.</p> |

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|     | <p>The Contractor shall be responsible for provision of (13) Nos. Copies of the Contract Agreement free of charge. The documents shall be arranged in the aforementioned sequence and provided to Employer within 10 days of signing of Contract Agreement.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 5.4 | <p><b><u>Documents Mutually Explanatory</u></b></p> <p>Paras 2 &amp; 3 of subclause are deleted and replaced with following:</p> <p>“The Technical Specifications are taken to be correct, but complete accuracy is not guaranteed. Any error or ambiguity must be reported to the Employer and the Project Manager/Engineer before starting the work affected. In the event of any dispute arising as to the true intended meaning of Technical Specification/Provisions, the Project Manager/Engineer shall interpret the same and his interpretation shall be accepted as final and binding upon all parties concerned, except to the extent provided for in the Arbitration provisions hereof.”</p>                                 |
|     | <p><b><u>Subclause GCC 5.5 is added as follows:</u></b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 5.5 | <p><b><u>“Codes and Standards</u></b></p> <p>Wherever references are made in the Contract to codes and standards in accordance with which the Contract shall be executed, the edition or the revised version of such codes and standards current at the date 28 days prior to date of bid submission shall apply unless otherwise specified. During Contract execution, any changes in such codes and standards shall be applied subject to approval by the Employer and shall be treated in accordance with GCC Clause 31.”</p>                                                                                                                                                                                                        |
| 6.1 | <p><b><u>Contractor’s Drawings</u></b></p> <p><b><u>The title and text of Subclause GCC 6.1 is substituted as follows:</u></b></p> <p>“6.1.1 The Contractor shall execute the basic and detailed design and the engineering work in compliance with the provisions of the Contract, or where not so specified, in accordance with good engineering practice.</p> <p>6.1.2 The Contractor shall submit to the Engineer the following drawings/ documents for approval within the time given in the Contract or as per Programme submitted according to GCC Subclause 12:</p> <p><b>(a) Drawings, Data and Instruction Manuals</b></p> <p>The following drawings shall be submitted in accordance with Schedule required by GCC 12.1:</p> |

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|     | <p>[details to be inserted by the Engineer /Consultant ]</p> <ul style="list-style-type: none"> <li>i. Specific Plant Data/Technical Data and manufacturer's catalogues of all electrical and mechanical equipment.</li> <li>ii. Such other drawings as are required by the Project Manager to demonstrate that all parts of the Plant being furnished / erected conform to the requirements of the Specifications.</li> <li>iii. The drawings shall be complete, shall have been reviewed and checked by the Contractor and shall be submitted in due time and in logical order to facilitate proper coordination.</li> </ul> <p>The Engineer shall signify his approval or disapproval thereof. If he fails to do so within the time given in the Contract or if no time limit is specified, within twenty eight (28) days of receipt, they shall be deemed to be approved.</p> <p>Approved data, drawings, samples and models shall be signed or otherwise identified by the Engineer. The Project Manager's approval, with or without modification of the document furnished by the Contractor subject to subclause GCC 6.2, shall not relieve the Contractor of any responsibility or liability imposed upon it by any provisions of the Contract.</p> <p>The Contractor shall supply additional copies of approved data/ drawings in the form and numbers stated in the Contract.</p> <p>Any part of the Works covered by or related to the documents to be approved by the Project Manager shall be executed only after the Project Manager's approval thereof.</p> |
| 6.2 | <p><b><u>Consequences of Disapproval of Contractor's Drawings</u></b></p> <p>Full stop is deleted and the following words are added at the end of Sub-Clause:</p> <p>"for the approval of the Engineer. However, the Contractor shall not be entitled for time extension on this account.</p> <p>If any dispute or difference occurs between the Employer and the Contractor in connection with or arising out of the disapproval by the Project Manager of any document and/or any modification(s) thereto then the same shall be resolved in accordance with clause GCC 50 hereof."</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 6.6 | <p><b><u>Operation and Maintenance Manuals</u></b></p> <p>Para 2&amp;3 are deleted and the following text is added at the end of Para 1 of Sub-Clause:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |



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|     | <p>“The Operation and Maintenance Manuals shall include full instructions for the operation, servicing and maintenance of the Plant, not only during the period of the Contractor’s liability but more particularly during its operating life.</p> <p>The directions shall be set out simply, clearly and systematically. This may be divided into two volumes if desirable, one for operation and the second for servicing and maintenance (in sub-volumes for major items of Plant).</p> <p>The operational data shall include a complete physical and functional description of the Plant (in sub-volumes for major items of Plant) and step-by-step procedures for inspection, checking and adjustments for proper operation of the Plant.</p> <p>The maintenance data shall include complete instructions for routine checks, servicing, maintenance and repair of all parts and for dismantling, handling and re-assembly of all equipment, sub-assemblies and all separate components. The maintenance data shall also include where possible parts catalogues. The lists shall provide all necessary information for identifying the parts and for re-ordering the parts including name of part, part number and catalogue references where applicable, name of manufacturer, size, capacity and other characteristics.</p> <p>General arrangements, single line diagrams and detailed drawings shall be provided for ready reference in the operation and maintenance instructions.</p> <p>The manuals shall be printed on ISO paper size A4 (210x297 mm) with offset or equivalent printing strongly bound in a durable stiff cover bearing the title in approved legend. Drawings shall be folded or reduced to 297 mm height. All volumes shall bear on the spine an approved shortened version of the title.</p> <p>The Contractor shall submit three (3) draft copies for approval of the Engineer prior to producing finished volumes.</p> <p>The Contractor shall provide ten (10) copies of the approved Operation and Maintenance Manuals prior to Taking Over by the Employer. Supplementary Operation and Maintenance Manual shall be provided by the Contractor, if required, to incorporate changes resulting from experience during the operation and maintenance period. The work shall not be considered to be completed for the purpose of taking over until such manual and drawings have been supplied to the Employer.”</p> |
| 6.9 | <p><u>Manufacturing Drawings</u></p> <p>The words “Unless otherwise specified in Part-II” are deleted and the following is added at the end of Sub-Clause:</p> <p>“However, the Contractor is required to disclose to the Engineer or the Employer any confidential information necessary to justify the reliability, the</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

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|      | efficiency and the operation and maintenance of the Plant supplied by him."                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 6.10 | <p><u>"As-Built" Drawings</u></p> <p>The following new Sub-Clause is added:</p> <p>The Contractor shall furnish to the Project Manager/Engineer six (6) copies and one (1) reproducible of approved quality of all "As-Built" drawings of material, foundation, pile, FAT / Type test reports and other documents mentioned in technical and special provisions within the period mentioned in the Preamble to Conditions of Contract. All drawings shall also be provided in an electronic form (USB) preferably in AutoCad format.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 6.11 | <p><u>Shop Drawings</u></p> <p>The Contractor shall submit to the Project Manager/Engineer for review three (3) copies of all shop and site erection work drawings in 1:4 scale seeking approval of the Project Manager/Engineer.</p> <p>Review and approval by the Project Manager/Engineer shall not be construed as a complete check but will indicate only that the general method of construction and detailing is satisfactory and that the Project Manager/Engineer's review or approval shall not relieve the Contractor of any of his responsibilities under the Contract."</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 7.2  | <p><u>Errors by Employer or Engineer</u></p> <p>The subclause GCC 7.2 is deleted in its entirety.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 8    | <u>Contractor's Obligations</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|      | <u>Text of sub-clause GCC 8.1 is deleted and substituted with following:</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 8.1  | <u>General Obligations</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|      | <p>(a) The Contractor shall commence the work on the date specified in the Preamble to Conditions of Contract and shall proceed with the same with due expedition and without delay.</p> <p>(b) Unless otherwise expressly limited in the Special Provisions and Technical Provisions, the Contractor's obligations cover the provision of all Works and the performance of all Installation Services required for the design, the manufacture (including procurement, quality assurance, testing and delivery) and the installation (including construction, associated civil works and erection), completion, and commissioning of the Plant in accordance with the plans, procedures, specifications, drawings, codes, and any other documents as specified in the sections Special Provisions and Technical Provisions. Such specifications include, but are not limited to, the provision of supervision and engineering services; the supply of labor, materials, equipment, spare parts (as specified in GCC Subclause 8.1(d) below) and accessories; Contractor's Equipment; construction utilities and supplies; temporary</p> |

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|      | <p>materials, structures, and facilities; transportation (including, without limitation, unloading and hauling to, from and at the Site); and storage.</p> <p>(c) The Contractor shall, unless specifically excluded in the Contract, perform all such work and/or supply all such items and materials not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for attaining Completion of the Plant as if such work and/or items and materials were expressly mentioned in the Contract.</p> <p>(d) In addition to the supply of Mandatory Spare Parts included in the Contract, the Contractor agrees to supply spare parts required for the operation and maintenance of the Plant, given in Schedule of Price No. 6 for a period of five (05) years. However, the identity, specifications, and quantities of such spare parts and the terms and conditions relating to the supply thereof are to be agreed between the Employer and the Contractor, and the price of such spare parts shall be that given in Schedule of Price No. 6, which shall be added to the Contract Price. The price of such spare parts shall include the purchase price therefore and other costs and expenses (including the Contractor's fees) relating to the supply of spare parts.</p> |
| 10.1 | <p><u>Performance Security</u></p> <p>Sub-Clause 10.1 is deleted and substituted by the following:</p> <p>"The Contractor shall provide a Performance Security in the prescribed Form annexed to these Documents. The said Security shall be furnished by the Contractor within 28 days after the receipt of Letter of Acceptance. The Performance Security shall be of an amount equal to 10 percent of the Contract Price in the currency(ies) of the Contract at the option of the bidder, in the form of Bank Guarantee from any Scheduled Bank in Pakistan or from a bank located outside Pakistan duly counter-guaranteed by a Scheduled Bank in Pakistan</p> <p>For avoidance of doubt, the Bank Guarantee issued by a foreign bank, without counter guarantee from a Scheduled Bank in Pakistan shall not be considered as an acceptable Bank Guarantee.</p> <p>The cost of complying with the requirements of this Sub-Clause shall be borne by the Contractor."</p>                                                                                                                                                                                                                                                                                                                                                        |
| 10.2 | <p><u>Period of Validity</u></p> <p>Sub-Clause 10.2 is deleted and substituted by the following:</p> <p>"The Performance Security shall be valid upto and shall become null and void on issuance of Defect Liability Certificate, provided, however, that if the Defects Liability Period has been extended on any part of the Works pursuant to GCC Sub clause 30.4 hereof or for the Goods/Equipment covered under extended defect liability period under sub Clause 30.1 , the Contractor shall issue an</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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|       | <p>additional security in an amount proportionate to the Contract Price of that part. The security shall be returned to the Contractor immediately after its expiration.</p> <p>Notwithstanding above, if the Contractor, pursuant to GCC Subclause 1.1.11, is liable for an extended defect liability obligation for equipment mentioned therein, the performance security shall be extended for the period and up to 10% of the amount proportionate to the Contract Price of such equipment, upon expiration whereof it shall be returned to the Contractor."</p>                                                                                                                                                                                                                                                                                 |
| 10.3  | <p><u>Claims under Performance Security</u></p> <p>Sub-Clause 10.3 is deleted in its entirety.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|       | The following Sub Clause is added:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 10.4  | <p><u>Performance Security Binding on Variations and Changes</u></p> <p>"The Performance Security shall be binding irrespective of variations and changes in the quantities of the Works or extensions in completion time of the Works, which are granted or agreed upon under the provisions of the Contract."</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 10A   | <u>Advance Payment Security</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 10A.1 | The Contractor shall, within 28 days after the receipt of Letter of Acceptance, provide a security in an amount equal to the advance payment calculated in accordance with Clause GCC 33 herein below, and in the same currency or currencies.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 10A.2 | <p>The security shall be in the form of Bank Guarantee provided in the Bidding Documents or in another form acceptable to the Employer, issued by a Scheduled Bank of Pakistan or from a bank located outside Pakistan duly counter-guaranteed by a Scheduled Bank in Pakistan in favor of the Employer valid for a period twenty eight (28) days beyond issue of taking over certificate. However, such Guarantee shall be progressively reduced by the amount repaid by the Contractor as indicated in Interim Payment Certificates of the Engineer issued in accordance with provisions of this Contract (The amount will be assumed repaid only when the employer has paid the monies against Interim Payment Certificate and not merely on issuance of interim payment certificate). The advance payment shall not be subject to retention.</p> |
| 11.1  | <p><u>Site Data</u></p> <p><u>The text of subclause GCC 11.1 is substituted with following:</u></p> <p>"The Tender shall be deemed to have been based on such data on climatic, hydrological and general conditions on the Site and for the operation of the Works available to or collected by the Contractor for the purposes of the Tender. The Contractor shall be responsible for his own interpretation of such data.</p> <p>The Contractor shall satisfy himself as to the nature of the ground, subsurface soil condition, the hydrological and climatic conditions, the form and nature of the Site, the quantities and nature of the Work and materials necessary for the</p>                                                                                                                                                              |

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|      | <p>completion of the Works, and the means of access to the Site, the accommodation he may require and in general shall himself obtain all necessary information as to risks, contingencies, and other circumstances which may influence or affect his Bid.</p> <p>The Employer does not guarantee the correctness of any data/information/drawings either verbal and/or written provided herein nor any interpretations, deductions or conclusions relative to conditions at Site. The Contractor shall form his own opinion of the character of the work and of the materials to be excavated etc. He shall make his own interpretations, and satisfy himself by his own investigations and research regarding all conditions affecting the work to be done. The Contractor shall assume all responsibility for deductions and conclusions as to the nature or conditions of the materials to be excavated and of doing other work affected by the geology at the Site."</p> |
| 11.2 | <p><b><u>Sufficiency of Contract Price</u></b></p> <p><u>First para of Subclause is substituted as under:</u></p> <p>"Subject to Clause GCC 11.1, the Contractor shall be deemed to have satisfied himself of correctness and sufficiency of the Contract Price, which shall cover all his obligations under the Contract and to have taken account of in his Tender:"</p> <p>The words "(if access has been made available to him)" are deleted from point (c).</p> <p>Last para of subclause is deleted.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 11.3 | <p><b>Physical Obstructions and Conditions</b></p> <p><u>First para of subclause is replaced with following:</u></p> <p>"Subject to GCC subclause 11.1, if during the execution of the Works on Site the Contractor encounters physical obstructions or conditions of the kind stipulated in Sub-Clause 26.1.c) which could not have been reasonably foreseen by the Contractor prior to the award of Contract, the Contractor shall be entitled to recover the additional cost incurred in consequence."</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 12.1 | <p><b>Programme to be Furnished</b></p> <p>Text of subclause is replaced with following:</p> <p>The Contractor shall submit to the Engineer for his approval the Programme which shall contain the following:</p> <p>(a) The order in which the Contractor proposes to carry out the Works (including preliminaries, design, manufacture, required material</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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|      | <p>ordering, delivery to Site, installation, erection and rectifications work, testing, commissioning of the Plant including design and construction of associated civil works and taking-over by the Employer). The program so submitted by the Contractor shall accord with the Time of Completion in GCC Subclause 25.1 and any other dates and periods specified in the Contract. The programme shall be based on format mentioned in Preamble to Conditions of Contract. The programme shall also include the following:</p> <ul style="list-style-type: none"> <li>(i) Employment of local and expatriate labour of various categories;</li> <li>(ii) Local material procurement; and</li> <li>(iii) Material imports, if any.</li> </ul> <p>(b) the times when submission and approval of the Contractor's Drawing are required,</p> <p>(c) the times by which the Contractor requires the Employer:</p> <ul style="list-style-type: none"> <li>(i) to furnish any Employer's Drawings,</li> <li>(ii) to provide access to the Site,</li> <li>(iii) to have obtained consents, wayleaves and approvals necessary for the purpose of the Works.</li> </ul> <p>The programme is to be furnished by the Contractor within twenty eight (28) days from the date of receipt of Letter of Acceptance and in the form acceptable to Project Manager. The Project Manager/Engineer's proposed changes/modifications may also be incorporated and revised program shall be submitted within fifteen (15) days.</p> <p>The approval by the Engineer of the Programme shall not relieve the Contractor or the Employer from any obligation under the Contract.</p> |
| 12.3 | <p><b>Revision of Programme</b></p> <p>Second para of subclause is deleted.</p> <p>Following is added at the end of first para of subclause:</p> <p>"The Contractor shall, at the instruction of the Project Manager, prepare and submit to the Project Manager a revised program, taking into account the prevailing circumstances, and shall notify the Project Manager of the steps being taken to expedite progress so as to attain Completion of the Plant within the Time for Completion under GCC Subclause 25.1 or any extension thereof entitled under GCC Subclause 26.1."</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|      | The following Sub-Clauses 12.4 to 12.6 are added:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

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| 12.4 | <p><b><u>Monthly Progress Report</u></b></p> <p>“During the period of the Contract, the Contractor shall submit six sets of report to the Engineer not later than the 8<sup>th</sup> day of each month, including:</p> <ul style="list-style-type: none"> <li>i. a construction schedule indicating the progress achieved during the preceding month;</li> <li>ii. description of all work carried out since the last report;</li> <li>iii. description of the work planned for the next forty two days sufficiently detailed to enable the Engineer to determine his programme of inspection and testing;</li> <li>iv. summary of daily job record for the preceding month; and</li> <li>v. colour photographs to illustrate progress.</li> </ul> <p>The progress report shall be in a form acceptable to the Project Manager and shall indicate: (a) percentage completion achieved compared with the planned percentage completion for each activity; and (b) where any activity is behind the program, giving comments and likely consequences and stating the corrective action being taken.”</p> |
| 12.5 | <p><b><u>Daily Job Record</u></b></p> <p>During the period of the Contract, the Contractor shall keep a daily record of the work progress, which shall be made available to the Project Manager/Engineer as and when requested.</p> <p>The daily record shall include particulars of weather conditions, number of men working in different categories, deliveries of materials, quantity, location and assignment of equipment.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 12.6 | <p><b><u>Protection of the Environment</u></b></p> <p>12.6.1 The Contractor shall take all reasonable steps to protect the environment (both on and off the Site) and to limit damage and nuisance to people and property resulting from pollution, noise, and other results of his operations.</p> <p>12.6.2 The Contractor shall ensure that emissions, surface discharges, and effluent from the Contractor’s activities shall not exceed the values stated in the Specification or prescribed by applicable Laws</p> <p>12.6.3 The Contractor will ensure that the preparation, design, and</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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|  | <p>implementation of project comply with:</p> <ul style="list-style-type: none"> <li>a) all applicable laws and regulations of Pakistan relating to environment, health, and safety;</li> <li>b) the Environmental Safeguards;</li> <li>c) the Environment Assessment Review Framework (EARF);</li> <li>d) all measures and requirements set forth in the respective EIA/IEE and EMP, and any corrective or preventative actions set forth in a Safeguards Monitoring Report.</li> </ul> <p>Pakistan Environmental Protection Act (PEPA) 1997, Provincial Environmental Protection Acts &amp; Other Agencies and provisions of IEE of the project shall be strictly adhered to.</p> <p><b>12.6.4 <u>Environmental Safeguards:</u></b></p> <p>The Contractor shall (a) establish an operational system for managing environmental impacts, (b) implement all the monitoring and mitigation measures set forth in the initial environmental examination and/or environmental management plan, (c) allocate the budget required ensuring that such measures are carried out, d) submit monthly environmental monitoring reports to the Employer.</p> <p>The Contractor shall comply with (i) the measures and requirements set forth in the initial environmental examination and the environmental management plan; and (ii) any corrective or preventative action plans worked out to correct non-compliances.</p> <p>Specially, Contractor(s) shall ensure that:</p> <p>A policy of incorporating and integrating environmental considerations into the operations for the Project as shown in the Environmental Management Plan, which is attached in Volume II is pursued.</p> <ul style="list-style-type: none"> <li>a) Following the award of the contract and prior to construction commencing the Contractor(s) will review the EMPs and develop this into a detailed Site-Specific Environmental Management Plan(s) (SEMP) that amplifies the conditions established in the EMP that are specific for the sites and the tasks involved.</li> <li>b) The SEMP(s) will be submitted to the Environment and Social Impact Cell of Employer for approval at least 10 days before taking possession of any work site.</li> </ul> |
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|  | <ul style="list-style-type: none"> <li>c) No access to the site will be allowed until the SEMP is approved by the Environment and Social Impact Cell of Employer.</li> <li>d) All mitigation and monitoring measures determined in the SEMP's are incorporated in detailed design and implemented during construction of the Project facilities in letter and spirit;</li> <li>e) Environmental monitoring, including instrumental water and air quality, and noise monitoring, as well as other types of monitoring defined in the IEE and EMP should be conducted on a daily basis and records stored, and reported to ESIC;</li> <li>f) Monthly environmental monitoring reports summarizing daily monitoring data should be submitted to Environment and Social Impact Cell of Employer; Quarterly progress reports should include a summary of environmental monitoring.</li> <li>g) Site Environment Specialist (s) with background in environmental management or similar discipline, and be able to complete the preparation of the site specific environmental management plans are appointed. The CVs of the applicants for the position should be shared with Environment and Social Impact Cell of Employer and the appointment should only be confirmed after approval from ESIC.</li> <li>h) All contracts under the subprojects contain provisions on compliance with these requirements; Budget for all such environmental and social measures is made available;</li> <li>i) A system for recording and communicating any complaints received by any person employed by or contracted to the Contractor (s) should be established. All complaints will be communicated in writing to the ESIC within one working day of their receipt.</li> <li>j) Trees (<i>Minimum 05-Feet in height</i>) plantation is carried out in accordance with the Environmental Approval obtained from the respective Environmental Protection Agency (EPA) and in accordance with the aesthetic value of the area.</li> <li>k) All invoices/amounts claimed by contractor (s) in lieu of Environment &amp; Social Safeguards Management would be sent to ESIC for verification in order to make things proper and transparent;</li> <li>l) Safety signs and awareness material printed in Urdu &amp; English languages (4 x 6 feet Panaflexes) are placed &amp; visible at project sites.</li> </ul> |
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|      | <p>m) Pathways and access roads, other local infrastructure (sewerage line, water transporting system/ pipes, rainwater drainage system etc.) damaged due to construction activity at the project site and agricultural land are restored to at least pre-project condition upon the completion of construction works.</p> <p>n) In case of non-compliance with mitigation measures defined in SEMP, Employer has the right to suspend work and withheld payments till the remedial measures will be undertaken. The failure to implement a corrective action plan and to implement it within the required time frame will result in the owner undertaking the works and the cost, plus up to 10% will be recovered from interim payments or the final payment to the Contractor. No extension of time will be allowed to the contractor in this regard.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 13.1 | <p><b>Contractor's Representative</b></p> <p>Text of Subclause is substituted with the following:</p> <p>"13.1.1 If the Contractor's Representative is not named in the Contract, then within 14 days of the Commencement Date, the Contractor shall appoint the Contractor's Representative and shall request the Employer in writing to approve the person so appointed. If the Employer makes no objection to the appointment within 14 days, the Contractor's Representative shall be deemed to have been approved. If the Employer objects to the appointment within 14 days giving the reason therefor, then the Contractor shall appoint a replacement within 14 days of such objection, and the foregoing provisions of this GCC Subclause 13.1.1 shall apply thereto.</p> <p>13.1.2 The Contractor's Representative shall represent and act for the Contractor at all times during the performance of the Contract and shall give to the Project Manager/Engineer all the Contractor's notices, instructions, information, and all other communications under the Contract.</p> <p>All notices, instructions, information, and all other communications given by the Employer or the Project Manager to the Contractor under the Contract shall be given to the Contractor's Representative or, in its absence, its deputy, except as herein otherwise provided.</p> <p>The Contractor shall not revoke the appointment of the Contractor's Representative without the Employer's prior written consent, which shall not be unreasonably withheld. If the Employer consents thereto, the Contractor shall appoint some other person as the Contractor's</p> |

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|      | <p>Representative, pursuant to the procedure set out in GCC Subclause 13.1.1</p> <p>13.1.3 The Contractor's Representative may, subject to the approval of the Employer which shall not be unreasonably withheld, at any time delegate to any person any of the powers, functions and authorities vested in him or her. Any such delegation may be revoked at any time. Any such delegation or revocation shall be subject to a prior notice signed by the Contractor's Representative, and shall specify the powers, functions, and authorities thereby delegated or revoked. No such delegation or revocation shall take effect unless and until a copy thereof has been delivered to the Employer and the Project Manager.</p> <p>Any act or exercise by any person of powers, functions and authorities so delegated to him or her in accordance with this GCC Subclause 13.1.3 shall be deemed to be an act or exercise by the Contractor's Representative.</p> <p>13.1.4 The Contractor's Representative shall be present on the Site during all working hours and shall not be transferred from the Site without the consent of the Project Manager/Engineer. The Contractor's Representative shall be a registered professional engineer as defined in the Pakistan Engineering Council Act 1975 (V of 1976)."</p> |
| 13.2 | <p><b>Objection to Contractor's Employees</b></p> <p><u>Following sentence is added at the end of subclause:</u></p> <p>"The Contractor shall, where required, promptly appoint a replacement thereof."</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 13.3 | <p><u>Subclauses 13.3 and 13.4 are added as follows:</u></p> <p><b><u>Staff of Contractor</u></b></p> <p>A reasonable proportion of the Contractor's superintending staff shall have a working knowledge of the English language. The Contractor shall provide and employ only technical personnel who are skilled and experienced in their respective callings and supervisory staff who are competent to adequately super</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 13.4 | <p><b><u>Employment of Local Personnel</u></b></p> <p>The Contractor shall, to the extent practicable and reasonable, employ staff and labour from sources within Pakistan.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 14.1 | <p><b><u>Contractor's Equipment</u></b></p> <p>Replace the word "or" at the end of Sub-paragraph (a) by the word "and" and</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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|      | insert the following at the end of Sub-paragraph(b): "which shall not be unreasonably withheld."                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 14.2 | <p><b><u>Safety Precautions</u></b></p> <p>At the end of the Sub-Clause the following is added:</p> <p>"In order to provide for the safety, health and welfare of persons, and for prevention of damage of any kind, all operations for the purposes of or in connection with the Contract shall be carried out in compliance with the safety requirements of the Government of Pakistan with such modifications thereto as the Project Manager/Engineer may authorize or direct and the Contractor shall take or cause to be taken such further measures and comply with such further requirements as the Project Manager/Engineer may determine to be reasonably necessary for such purpose.</p> <p>The Contractor shall make, maintain, and submit reports to the Project Manager/Engineer concerning safety, health and welfare of persons and damage to property as the Project Manager/Engineer may from time to time prescribe."</p>                                                                                                                                          |
| 14.3 | <p><b><u>Electricity Water and Gas</u></b></p> <p>The text of Sub-Clause 14.3 is deleted and substituted by the following:</p> <p>"The Contractor shall be responsible for making his own arrangements for the adequate supply of electricity, water and gas required for the effective performance of his obligations under the Contract. Subject to the aforesaid, the Contractor shall be entitled to use for the purposes of the Works such supplies and services as may be available on the Site. The Contractor shall, before the commencement of the work at Site, seek the approval of the Project Manager/Engineer as to his detailed requirements of electricity, water and gas for the entire Contract period. The Contractor shall pay the Employer at the rates/cost incurred by the Employer. The Contractor shall at his own cost provide any apparatus necessary for such use. The contractor will bear the cost of distribution network for electricity, potable water, telephone, gas and their consumption by his own personnel for the purpose of the work."</p> |
| 14.4 | <p><b><u>Employer's Equipment</u></b></p> <p>The text of Sub-Clause 14.4 is deleted and substituted by the following:</p> <p>"The Employer shall, if the Contractor so requests for the execution of the works, operate any available equipment of which details are given in the Preamble to Conditions of Contract. The Contractor shall pay the Employer a mutually agreed price for such use.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

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|      | The Employer shall during such operation retain control of and be responsible for the safe working of the equipment."                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 14.6 | <p><b>Opportunities for Other Contractors</b></p> <p><u>Following paras are added at the end of subclause:</u></p> <p>"The Contractor shall also so arrange to perform its work as to minimize, to the extent possible, interference with the work of other contractors. The Project Manager/Engineer shall determine the resolution of any difference or conflict that may arise between the Contractor and other contractors and the workers of the Employer in regard to their work.</p> <p>The Contractor shall notify the Project Manager/Engineer promptly of any defects in the other Contractors' work that come to its notice, and that could affect the Contractor's work. The Project Manager shall determine the corrective measures, if any, required to rectify the situation after inspection of the Works. Decisions made by the Project Manager/Engineer shall be binding on the Contractor."</p>                                                                                                                                                                                                                                                                                            |
| 14.8 | <p><b>Information for Import Permits and Licenses</b></p> <p><u>The text of subclause is deleted and substituted with following:</u></p> <p>"The Contractor shall acquire and pay for all permits, approvals, and/or licenses from all local, state, or national government authorities or public service undertakings in Pakistan, which such authorities or undertakings require the Contractor to obtain in its name and which are necessary for the performance of the Contract, including, without limitation, visas for the Contractor's and Subcontractor's personnel and entry permits for all imported Contractor's Equipment. The Contractor shall acquire all other permits, approvals, and/or licenses that are not the responsibility of the Employer under GCC Subclause 17.5 hereof and that are necessary for the performance of the Contract.</p> <p>The Contractor shall submit to the Employer in good time such details of all Plant and Contractor's Equipment to be imported into Pakistan for which it requires Employer's assistance and identify as to what assistance of the Employer is required for obtaining by the Contractor of all necessary import permits or licenses."</p> |
| 14.9 | <p><u>The following Subclause GCC 14.9 is added:</u></p> <p><b>Procurement and Transportation</b></p> <p>14.9.1 The Contractor shall procure and transport all materials in an expeditious and orderly manner to the Site. The Contractor shall adequately record the condition of roads, agricultural land and other</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

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|      | <p>infrastructure prior to the start of transporting materials, goods and equipment, and construction.</p> <p>14.9.2 The Contractor shall at its own risk and expense transport all the materials and the Contractor's Equipment to the Site by the mode of transport that the Contractor judges most suitable under all the circumstances.</p> <p>14.9.3 Unless otherwise provided in the Contract, the Contractor shall be entitled to select any safe mode of transport operated by any person to carry the materials and the Contractor's Equipment.</p> <p>14.9.4 Upon dispatch of each shipment of materials and the Contractor's Equipment, the Contractor shall notify the Employer by telex, cable, facsimile, or electronic means, of the description of the materials and of the Contractor's Equipment, the point and means of dispatch, and the estimated time and point of arrival in Pakistan, if applicable, and at the Site. The Contractor shall furnish the Employer with relevant shipping documents to be agreed upon between the parties.</p> <p>14.9.5 The Contractor shall be responsible for obtaining, if necessary, approvals from the authorities for transportation of the materials and the Contractor's Equipment to the Site. The Employer shall use its best endeavors in a timely and expeditious manner to assist the Contractor in obtaining such approvals, if requested by the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any claim for damage to roads, bridges, or any other traffic facilities that may be caused by the transport of the materials and the Contractor's Equipment to the Site.</p> |
| 15.2 | <p><b><u>Compliance with Laws</u></b></p> <p>The Sub-Clause 15.2 is deleted and substituted by the following:</p> <p>"The Contractor shall comply with the laws of the country of manufacture concerning the manufacture of the Plant, and the Laws of Pakistan where the Plant is to be erected. The laws will include all local, state, national, or other laws that affect the performance of the Contract and bind upon the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, damages, claims, fines, penalties, and expenses of whatever nature arising or resulting from the violation of such laws by the Contractor or its personnel, including the Subcontractors and their personnel."</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 16.4 | <p><b><u>Following GCC subclauses 16.4 to 16.6 are added:</u></b></p> <p><b>License/Use of Technical Information</b></p> <p>(a) For the operation and maintenance of the Plant, the Contractor hereby grants</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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|      | <p>a non-exclusive and nontransferable license (without the right to sublicense) to the Employer under the patents, utility models, or other industrial property rights owned by the Contractor or by a third party from whom the Contractor has received the right to grant licenses thereunder, and shall also grant to the Employer a nonexclusive and nontransferable right (without the right to sublicense) to use the know-how and other technical information disclosed to the Employer under the Contract. Nothing contained herein shall be construed as transferring ownership of any patent, utility model, trademark, design, copyright, know-how, or other intellectual property right from the Contractor or any third party to the Employer.</p> <p>(b) The copyright in all drawings, documents, and other materials containing data and information furnished to the Employer by the Contractor herein shall remain vested in the Contractor or, if they are furnished to the Employer directly or through the Contractor by any third party, including suppliers of materials, the copyright in such materials shall remain vested in such third party.</p> |
| 16.5 | <p><b><u>Photographs of Works and Advertisement Prohibited</u></b></p> <p>Except with the prior written authorization of the Employer the Contractor shall not exhibit or permit to be exhibited any photographs or advertisement on the Works. Any authorized exhibition shall be immediately removed if the Employer so requires.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 16.6 | <p><b><u>Training of Employer's/ Engineer's Staff</u></b></p> <p>The Contractor shall provide such facilities for the training of such numbers of Pakistani engineers, engineering students, apprentices and trade apprentices on such sections of the Works at the Site or on the Contractor's premises or Contractor selected plant manufacturer's premises and factories, or wherever else work is in hand, as specified or directed by the Project Manager/Engineer. The Employer shall direct what sums by way of wages and allowances are to be paid by the Contractor to such persons and shall reimburse the Contractor for such sums as are so directed to be paid and are paid. The Contractor shall also provide medical expenses or medical insurance and travelling expenses for trainees if required by the Employer which shall be reimbursed by the Employer.</p> <p>The language of training at the above stated premises shall be English and Urdu.</p>                                                                                                                                                                                                      |
| 17.1 | <p><b><u>Access to and Possession of the Site</u></b></p> <p>GCC Subclause 17.1 is substituted with following:</p> <p>"The Employer shall be responsible for acquiring and providing legal and physical possession of the Site and access thereto, and for providing possession</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

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|      | of and access to all other areas reasonably required for the proper execution of the Contract, including all requisite rights of way. The Employer shall give access to and possession of Site which, however, may not be exclusive to the Contractor."                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 17.4 | <p><b><u>Consents and Way Leaves</u></b></p> <p>The Sub-Clause 17.4 is deleted and substituted by the following:</p> <p>"The Employer shall issue permissions, letters, certificates and provide such other assistance to the Contractor for his obtaining permits-to-work, way leaves and approvals from any other department/authority and right of way from private owners, if required. The Contractor will bear the cost of logistics, fees, etc. for such activities. The Employer, will reimburse the Contractor only the payments made by him in respect of any land compensation for obtaining such way leaves, required for the Works."</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 17.5 | <p><b><u>Import Permits and Licenses</u></b></p> <p>Subclause GCC 17.5 is replaced with following:</p> <p>"The Employer shall acquire and pay for all permits, approvals, and/or licenses from all local, state, or national government authorities, or public service undertakings in Pakistan which (a) such authorities or undertakings require the Employer to obtain in the Employer's name, (b) are necessary for the execution of the Contract, including those required for the performance by both the Contractor and the Employer of their respective obligations under the Contract</p> <p>If requested by the Contractor, the Employer shall use its best endeavors to assist the Contractor in obtaining in a timely and expeditious manner all permits, approvals, and/or licenses necessary for the execution of the Contract from all local, state, or national government authorities, or public service undertakings that such authorities or undertakings require the Contractor or Subcontractors or the personnel of the Contractor or Subcontractors, as the case may be, to obtain."</p> |
| 18.1 | <p><b><u>Engagement of Labour</u></b></p> <p>At the end of the Clause the following is added:</p> <p>"in accordance with the regulations, orders and requirements of the Govt. of Pakistan.</p> <p>The Contractor shall pay rates of wages, and observe conditions of labor, which are not lower than those established for the trade or industry where the work is carried out. If no established rates or conditions are applicable, the Contractor shall pay rates of wages and observe conditions which are not lower than the general level of wages and conditions observed locally by employers whose</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |



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|      | <p>trade or industry is similar to that of the Contractor.</p> <p>The Contractor shall inform the Contractor's personnel about their liability to pay personal income taxes in the Country in respect of such of their salaries, wages, and allowances as are chargeable under the Laws for the time being in force, and the Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such Laws."</p> |
| 18.3 | <p><b>Working Hours</b></p> <p>The last sentence "The extra cost, ..... of the Contractor." of subclause is deleted.</p>                                                                                                                                                                                                                                                                                                                           |
|      | <p><u>Following subclauses GCC 18.5 to GCC 18.16 are added:</u></p>                                                                                                                                                                                                                                                                                                                                                                                |
| 18.5 | <p><b><u>Employment of Persons in the Service of Others</u></b></p> <p>The Contractor shall not recruit or attempt to recruit his staff and labour from amongst the persons in the service of the Employer or the Project Manager/Engineer and vice-versa, unless mutually agreed between the Employer/Project Manager/Engineer and the Contractor.</p>                                                                                            |
| 18.6 | <p><b><u>Alcoholic Liquor or Drugs</u></b></p> <p>The Contractor shall not, otherwise than in accordance with the statutes, Ordinances and Government Regulations or Orders for the time being in force, import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs, or permit or suffer any such importation, sale gift, barter or disposal by his Subcontractors, agents, employees or labour.</p>                         |
| 18.7 | <p><b><u>Arms and Ammunition</u></b></p> <p>The Contractor shall not give, barter or otherwise dispose of to any person or persons, any arms or ammunition of any kind or permit or suffer the same as aforesaid.</p>                                                                                                                                                                                                                              |
| 18.8 | <p><b><u>Festivals and Religious Customs</u></b></p> <p>The Contractor shall in all dealings with his staff and labour have due regard to all recognized festivals, days of rest and religious or other customs.</p>                                                                                                                                                                                                                               |
| 18.9 | <p><b><u>Disorderly Conduct</u></b></p> <p>The Contractor shall at all times take all reasonable precautions to prevent any unlawful riotous or disorderly conduct by or amongst his staff and labour and for the preservation of peace and protection of persons and property in the neighborhood of the Works against the same.</p>                                                                                                              |

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| 18.10   | <b><u>Site Regulations and Safety, Health and Safety, Funeral Arrangements</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 18.10.1 | <p>The Employer and the Contractor shall establish Site regulations setting out the rules to be observed in the execution of the Contract at the Site and shall comply therewith. The Contractor shall prepare and submit to the Employer, with a copy to the Project Manager, proposed Site regulations for the Employer's approval, which approval shall not be unreasonably withheld.</p> <p>Such Site regulations shall include, but shall not be limited to, rules in respect of security, safety of the Works, gate control, sanitation, medical care, and fire prevention.</p> |
| 18.10.2 | <p>The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's personnel. In collaboration with local health authorities, the Contractor shall ensure that medical staff, first aid facilities, sick bay, and ambulance service are available at all times at the Site and at any accommodation for Contractor's and Employer's personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics.</p>                                            |
| 18.10.3 | <p>The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to issue instructions and take protective measures to prevent accidents. Throughout the performance of the Contract, the Contractor shall provide whatever is required by this person to exercise this responsibility and authority.</p>                                                                                                        |
| 18.10.4 | <p>The Contractor shall send to the Project Manager, details of any accident as soon as practicable after its occurrence. The Contractor shall maintain records and make reports concerning health, safety, and welfare of persons, and damage to property, as the Project Manager may reasonably require.</p>                                                                                                                                                                                                                                                                        |
| 18.10.5 | <p>The Contractor shall at all times take the necessary precautions to protect the Contractor's Personnel employed on the Site from insect and pest nuisance, and to reduce their danger to health. The Contractor shall comply with all the regulations of the local health authorities, including use of appropriate insecticide.</p>                                                                                                                                                                                                                                               |
| 18.10.6 | <p>In the event of any outbreak of illness of an epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government, or the local medical or sanitary authorities, for purpose of dealing with and overcoming the same.</p>                                                                                                                                                                                                                                                                                   |
| 18.10.7 | <p>In the event of the death of any of the Contractor's personnel or accompanying members of their families, the Contractor shall be responsible for making the appropriate arrangements for their return</p>                                                                                                                                                                                                                                                                                                                                                                         |

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|       | or burial.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 18.11 | <p><b><u>Reporting of Accidents</u></b></p> <p>The Contractor shall report to the Project Manager/Engineer details of any accident as soon as possible after its occurrence. In the case of any fatality or serious accident, the Contractor shall, in addition to appropriate action required under the law, notify the Project Manager/Engineer immediately by the quickest available means.</p>                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 18.12 | <p><b><u>Compliance by Subcontractors</u></b></p> <p>The Contractor shall be responsible for compliance by his Subcontractors of the foregoing provisions.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 18.13 | <p><b><u>Housing for Labour</u></b></p> <p>Save insofar as the Contract otherwise provides, the Contractor shall provide and maintain such housing accommodation and amenities as he may consider necessary for all his supervisory staff and labour, employed for the purposes of or in connection with the Contract including all fencing, electricity supply, sanitation, cookhouses, fire prevention, water supply and other requirements in connection with such housing accommodation or amenities. On completion of the Contract, these facilities shall be handed over to the Employer or if the Employer so desires, the temporary camps or housing provided by the Contractor shall be removed and the Site reinstated to its original condition, all to the approval of the Project Manager/Engineer.</p> |
| 18.14 | <p><b><u>Supply of Water and Foodstuff</u></b></p> <p>The Contractor shall, so far as is reasonably practicable, having regard to local conditions, provide on the Site, to the satisfaction of the Project Manager/Engineer or his representative, adequate supply of drinking and other water for the use of his staff and labour. The Contractor shall also arrange for the provision of a sufficient supply of suitable food at reasonable prices for the Contractor's Personnel for the purposes of or in connection with the Contract.</p>                                                                                                                                                                                                                                                                     |
| 18.15 | <p><b><u>Prohibition of All Forms of Forced or Compulsory Labor</u></b></p> <p>The contractor shall not employ "forced or compulsory labor" in any form. "Forced or compulsory labor" consists of all work or service, not voluntarily performed, that is extracted from an individual under threat of force or penalty.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 18.16 | <p><b><u>Prohibition of Harmful Child Labor</u></b></p> <p>The Contractor shall not employ any child to perform any work that is</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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|      | economically exploitative, or is likely to be hazardous to, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 19.1 | <p><b><u>Manner of Execution</u></b></p> <p>The following is added at the end of Sub-Clause:</p> <p>"The Contractor shall submit for approval of the Project Manager/Engineer, his detailed method statement(s) for the execution of such items of work as may be desired by the Project Manager/Engineer. Approval of such method statement(s) shall neither relieve the Contractor of his responsibilities under the Contract nor form any basis for claiming additional costs."</p>                                                                                                                                                                                                                                                                    |
|      | <p><b><u>Sub-Clause 19.3 Uncovering Work</u></b></p> <p>The following is added at the end of second paragraph of Sub-Clause 19.3:</p> <p>"In any other case, all costs shall be borne by the Contractor."</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 19.4 | <p><b><u>Use of Pakistani Materials</u></b></p> <p>The following Sub-Clause 19.4 is added:</p> <p>"The Contractor shall so far as may be consistent with the Contract make the maximum use of materials, supplies and equipment indigenous to or produced in Pakistan and services available in Pakistan or operated in Pakistan provided such materials, supplies, equipment and services shall be of required standard."</p>                                                                                                                                                                                                                                                                                                                            |
| 20.1 | <p><b><u>Independent Inspection</u></b></p> <p>GCC Subclause 20.1 is deleted in its entirety.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 20.2 | <p><b><u>Inspection and Testing During Manufacture</u></b></p> <p>Subclause 20.2 is replaced with following:</p> <p>20.2.1 The Contractor shall at its own expense carry out at the place of manufacture and/or on the Site all such tests and/or inspections of the Plant and any part of the Plant as are specified in the Contract.</p> <p>20.2.2 Authorized representatives of Employer i.e.</p> <p>(i) One representative of Director General (Transmission Engineering) NGC and one representative of the independent inspector hired by Contractor pursuant to GCC 20.1 in case the equipment is listed in NGC's Type Test Policy.</p> <p>(ii) Two representatives of Director General (Transmission Engineering) NGC for all other equipment.</p> |

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|        | <p>Shall carry out pre-shipment inspection of the plant/material/equipment at manufacturer's works. All reasonable facilities (laboratory, tools, instruments, machines, samples etc.) as provided in the specifications or followed by trade and industry in general shall have to be offered to the inspectors, by Contractor at his expense for carrying out Testing and Inspection. The Contractor shall fully assist the nominated inspectors in submission of visa application(s) by providing all supporting document on his part and help in attaining visa through necessary correspondence with the embassy.</p>                                                                                                                           |
| 20.2.3 | <p>Two authorized representatives of Director General (Transmission Engineering), shall witness the Type Tests (if applicable in accordance with clause 4, Technical Specifications of Volume-II (Technical Provisions) as per NGC type test policy. The Contractor shall fully assist the nominated inspectors in submission of visa application(s) by providing all supporting document on his part and help in attaining visa through necessary correspondence with the embassy.</p>                                                                                                                                                                                                                                                              |
| 20.2.5 | <p>The cost of witnessing test, pre-shipment inspection or repetition thereof by the representative(s) of Director General (Transmission Engineering) NGC (which shall include visa expense, return air ticket, boarding, lodging etc. as the case may be along with a daily allowance of US\$ 150/day/inspector in case of foreign inspection and Rs. 4000/day/inspector) shall be borne by the Contractor without any additional cost to the Employer. The cost of witnessing of pre-shipment inspection or repetition thereof by representative of independent inspector shall be covered by the Contractor according to agreement/ subcontract between the Contractor and independent inspector without any additional cost to the Employer.</p> |
| 20.2.6 | <p>The Contractor shall keep the Employer and Project Manager informed the progress of manufacturing and notify the Project Manager at least eight (08) weeks in advance, in writing as to when the Plant or any part thereof will be ready for inspection and/or performance of type tests (if applicable in accordance with clause 4, Subsection-2 (Technical Specifications) of Volume-II (Technical Provisions).</p>                                                                                                                                                                                                                                                                                                                             |
| 20.2.7 | <p>The Contractor shall provide the Project Manager with a certified report of the results of any such test and/or inspection. If the Employer or Project Manager or their designated representatives fails to attend the test and/or inspection, or if it is agreed between the parties that such persons shall not do so, then the Contractor may proceed with the test and/or inspection in the absence of such persons, and may provide the Project Manager with a certified report of the results thereof.</p>                                                                                                                                                                                                                                  |
| 20.2.8 | <p>The Project Manager may require the Contractor to carry out any test and/or inspection not required by the Contract, provided that the</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

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|      | <p>Contractor's reasonable costs and expenses incurred in carrying out such test and/or inspection shall be added to the Contract Price. Further, if such test and/or inspection impedes the progress of work on the Works and/or the Contractor's performance of its other obligations under the Contract, due allowance will be made in respect of the Time for Completion and the other obligations so affected.</p> <p>20.2.9 Any inspection and/or witnessing of tests or the waiving of such tests and/or surveillance by the Employer and Project Manager or their two Nos. Representatives shall not relieve the Contractor of its obligations and responsibilities under the Contract regardless of any approval or consent given by the Employer and Project Manager.</p> <p>All work covered by the Contract shall be subject to surveillance, testing and inspection by the representatives of the Employer. The Inspectors may require witnessing any or all the tests to be carried out. For such purpose the Contractor shall provide free access at all times during manufacture, assembly and testing to the premises in which the work is being carried out.</p> <p>20.2.10 If any dispute or difference of opinion shall arise between the parties in connection with or arising out of the test and/or inspection of the Plant or part of the Works that cannot be settled between the parties within a reasonable period of time, it may be settled in accordance with GCC Subclause 50</p> <p>20.2.11 The Contractor shall afford the Employer and the Project Manager, at the Employer's expense, access at any reasonable time to any place where the Plant are being manufactured or the Works are being installed, in order to inspect the progress and the manner of manufacture or installation, provided that the Project Manager shall give the Contractor a reasonable prior notice.</p> |
|      | <u>GCC Subclauses 20.3 and 20.4 are deleted in their entirety.</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 21.1 | <p><b>Rejection</b></p> <p>Last para of subclause is replaced with following:</p> <p>"The tests shall be repeated under the same terms and conditions without any additional cost to the Employer."</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 23.1 | <p><b>Order to Suspend</b></p> <p><u>Following is added at the end of subclause:</u></p> <p>"During such period, the Contractor shall not remove from the Site any Plant, any part of the thereof or any Contractor's Equipment, without the prior written consent of the Employer."</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 24.1 | <b>Cost of Suspension</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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|      | <p>Following is added at the end of second para:</p> <p>“or for the proper execution or for the safety of the Works or Plant unless such necessity results from any act or default of the Project Manager/Engineer or the Employer or in consequence of any of the Employer’s Risks under Sub-Clause 37.2.”</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 24.4 | <p><b><u>Resumption of Work</u></b></p> <p>First paragraph of Sub-Clause 24.4 is deleted and substituted by the following:</p> <p>“If the Contractor chooses not to treat prolonged suspension as an omission or termination under Sub-Clause 24.3, the Employer shall, upon the request of the Contractor, take over the responsibility for protection, storage, security and insurance of the suspended Works and of the Plant which has been delivered to the Site and which is affected by suspension and the risk of loss or damage thereto shall thereupon pass to the Employer.”</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 25.1 | <p><b><u>Time for Completion</u></b></p> <p>The text of Sub-Clause 25.1 is deleted and substituted by the following:</p> <p>“The Works at the place of the project mentioned in the Preamble to Conditions of Contract shall be completed tested and commissioned within the period mentioned in the Preamble to Conditions of Contract.”</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 26.1 | <p><b><u>Extension of Time for Completion</u></b></p> <p>The Existing Text of the provision is deleted and replaced with the following.</p> <p><i>The Contractor shall be entitled subject to provisions of this clause to an extension of the Time for Completion if and to the extent that completion for the purposes of Clause 25.1 is or will be delayed by any of the following causes:</i></p> <ul style="list-style-type: none"> <li><i>i. a Variation (unless an adjustment to the Time for Completion has been agreed)</i></li> <li><i>ii. a cause of delay giving an entitlement to extension of time under a Sub-Clause of these Conditions,</i></li> <li><i>iii. any delay, impediment or prevention caused by or attributable to the Employer, the Employer’s Personnel, or the Employer’s other contractors on the Site.</i></li> </ul> <p><i>If the Contractor considers himself to be entitled to an extension of the Time for Completion, the Contractor shall give notice to the Engineer in accordance with this Clause. The Engineer shall after due consultation with the Employer and the Contractor, determine the amount of such extension and shall notify the Employer and Contractor accordingly. While determining each extension of time under this Clause, the Engineer shall review previous determinations and may increase, but shall not decrease, the total extension of time.</i></p> <p><i>The Engineer shall make his determinations and notify the finalized/approved determination within reasonable time but not later than 90 days after submission of interim/final particulars</i></p> |

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|      | <p><i>by the Contractor in pursuance of this Clause as per prevalent SoPs .</i></p> <p><b><u>Notification Conditions for the Claims under This Clause</u></b></p> <p>Provided that the Engineer is not bound to make any determination unless the Contractor has:-</p> <ul style="list-style-type: none"> <li>(a) within 28 days after such event has first arisen notified the Engineer with a Particulars copy to the Employer, and</li> <li>(b) within 28 days, or such other reasonable time as may be agreed by the Engineer, after such notification submitted to the Engineer detailed particulars of any extension of time to which he may consider himself entitled in order that such submission may be investigated at the time.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 26.3 | <p><b><u>Earlier Completion</u></b></p> <p>A. At the end of Sub-Clause 26.3(a) the following text is added and Clause is re-designated as 26.3.</p> <p>“The extra sum to be paid to the Contractor for Completion of Works prior to the date of Completion established under Sub-Clause 25.1 shall be computed on the basis of the sums mentioned in the Preamble to Conditions of Contract.”</p> <p>B. Sub-Clause 26.3 (b) is deleted.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|      | Subclause GCC 26.4 is added as follows:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 26.4 | <p><b><u>Rate of Progress</u></b></p> <p>If for any reason, which does not entitle the Contractor to an extension of time, the rate of progress of the Works or any Section is at any time, in the opinion of the Project Manager/Engineer, too slow to comply with the Time for Completion, the Project Manager/Engineer shall so notify the Contractor who shall thereupon take such steps as are necessary, subject to the consent of the Project Manager/Engineer, to expedite progress so as to comply with the Time for Completion. The Contractor shall not be entitled to any additional payment for taking such steps. If, as a result of any notice given by the Project Manager/Engineer under this Clause, the Contractor considers that it is necessary to do any work at night or on locally recognized days of rest, he shall be entitled to seek the consent of the Project Manager/Engineer so to do. Provided that if any steps, taken by the Contractor in meeting his obligations under this Sub-Clause, involve the Employer in additional supervision costs, such costs shall, after due consultation with the Employer and the Contractor, be determined by the Project Manager/Engineer and shall be recoverable from the Contractor by the Employer, and may be deducted by the Employer from any moneys due or to become due to the Contractor and the Project Manager/Engineer shall notify the Contractor accordingly, with a copy to the Employer.</p> |



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|      | <p>In case of any delay on account of repeated/inordinate/erroneous submittals of designs/technical data as well as the repeated request for change of manufacturers, the Employer shall recover any additional costs incurred in maintaining design review/approval services for such extended period besides imposition of liquidated damages.</p> <p>In case of Transmission Line Contract, only two (02) manufacturers are allowed to be changed whereas for Substation Contract, upto five (05) manufacturers can be changed by the Contractor during the currency of the contract subject to any valid reasons/refusal letter from original manufacturer. However, evaluation of new proposed manufacturer will be carried out on the criteria applicable in tender document</p> <p>The Contractor shall submit to Engineer and Employer the daily, weekly, monthly progress reports and cash flow projections on the format approved by the Engineer. The monthly reports shall be submitted within 05 days from completion of the respective month.</p> <p>The Contractor shall make available and install [insert appropriate number] number of WEBCAMS alongside necessary storage of at least 06 months and servers for continuous monitoring of site (instant sites in case of T/Lines) activities. The Contractor will provide access to the Engineer and Employer's designate persons. The placing/location/coverage decision for the installation of WEBCAMS will be done with consent of Engineer.</p> <p>[Notes to Procurement Consultant/Design Engineer: The provision has been inserted as Project Management best practice taking que from PMBOK guide-6<sup>th</sup> edition (Project Procurement Management). The availability of these provisions may also be depicted in baseline for Consultancy Supervision Contracts]</p> |
| 27.1 | <p><b><u>Delay in Completion</u></b></p> <p>Sub-Clause 27.1 is deleted and substituted by the following:</p> <p>"If the Contractor fails to deliver the Works, or any part thereof, within the time stated in Sub-Clause 25.1, or fails to complete the whole of the Work, or, if applicable, any Section within the relevant time prescribed by Sub-Clause 25.1, then the Contractor shall pay to the Employer the relevant sum mentioned in Preamble to Conditions of Contract as liquidated damages for such default (which sum shall be the only moneys due from the Contractor for such default) for every day or part of a day which shall elapse between the relevant time for Delivery or Time for Completion and the actual date of delivery at site or the date stated in a Taking-Over Certificate of the whole of the Works or the</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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|       | <p>relevant Section, as the case may be, provided that the aggregate amount of such liquidated damages shall in no event exceed the maximum amount specified as in Preamble to Conditions of Contract</p> <p>The Employer may deduct the amount of such damages from any monies due or to become due to the Contractor. The payment or deduction of such damages shall not relieve the Contractor from his obligation to complete the Works, or from any other of his obligations and liabilities under the Contract.</p> <p>The liquidated damages for each day of delay and the maximum amount of liquidated damages shall be the amounts mentioned in the Preamble to Conditions of Contract.”</p> |
| 28.1  | <p><b>Notice of Tests</b></p> <p>The words “ The Employer” at the start of subclause are deleted and substituted with following:</p> <p>“As soon as the Plant or any part thereof has, in the opinion of the Contractor, been completed operationally and structurally and put in a tight and clean condition as specified in the Special Provisions or Technical Provisions, excluding minor items not materially affecting the operation or safety of the Plant, the Contractor”</p>                                                                                                                                                                                                                |
| 28.4  | The Employer shall not provide any labour, materials, electricity, fuel, water, stores, apparatus and feedstock to Contractor to carry out the Tests.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 28.6  | <p><b>Disagreement as to Result of Tests</b></p> <p>The following sentence is added at the end of subclause.</p> <p>“The parties shall then proceed in accordance with the procedure set out in GCC Clause 50.”</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 28.7  | <p><b><u>Consequences of Failure to Pass Tests on Completion</u></b></p> <p>The words “by arbitration” appearing at the end of the Sub-Clause 28.7€ are deleted and substituted by the words “by the Project Manager/ Engineer”.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 30.4  | <p><b><u>Extension of Defects Liability Period</u></b></p> <p>At the end of 4<sup>th</sup> paragraph of Sub-Clause the following is added: “or a mutually agreed period.”</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 30.5  | <p><b><u>Failure to Remedy Defects</u></b></p> <p>In first line after the words “reasonable time” the following is added: “fixed by the Project Manager/ Engineer”.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 30.11 | The following text is inserted at end of this provision                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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|       | <p>However, the issuance of Defect Liability Certificate can be withheld by the Project Manager/Engineer if Contractor fails to submit completion report along with As built data/ drawings, material reconciliation reports, Operation &amp; Maintenance manuals and Hard and Soft Copies of site records/ data to the Engineer for information and approval prior to expiry of Defect Liability Period.</p>                                                                                                                                            |
| 30.13 | <p>New Sub-Clause 30.13 is added as herein below:</p> <p><b><u>Unfulfilled Obligations</u></b></p> <p>“After the Defects Liability Certificate has been issued, the Contractor and the Employer shall remain liable for the fulfillment of any obligation which remains unperformed at that time. For the purposes of determining the nature and extent of any such obligation, the Contract shall be deemed to remain in force.”</p>                                                                                                                    |
| 31.1  | <p><b><u>Engineer’s Right to Vary</u></b></p> <p>The following is added at the end of second paragraph:</p> <p>“No such variation shall in any way vitiate or invalidate the Contract, but the effect, if any, of all such variations shall be valued in accordance with Clause 31. Provided that where the issue of an instruction to vary the Works is necessitated by some default of or breach of Contract by the Contractor or for which he is responsible, any additional cost attributable to such default shall be borne by the Contractor.”</p> |
| 31.5  | <p><b><u>Record of Costs</u></b></p> <p>The word “Engineer” in 4<sup>th</sup> line of Sub-Clause is deleted and substituted by “Project Manager/ Engineer/ Employer”.</p>                                                                                                                                                                                                                                                                                                                                                                                |
|       | <p>New Sub-Clauses 31.6 is added as given below:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 31.6  | <p><b><u>Value Engineering</u></b></p> <p>The Contractor may, at any time, submit to the Project Manager/Engineer a written proposal which in the Contractor’s opinion will reduce the cost of constructing, maintaining or operating the works, or improve the efficiency or value to the Employer of the completed Works or otherwise be of benefit to the Employer. Any such proposal shall be prepared at the cost of the Contractor. However Employer is not bound to accept such proposal.</p>                                                     |
| 32.1  | <p><b><u>Ownership of Plant</u></b></p> <p><u>Subclause GCC 32.1 is replaced with following:</u></p> <p>“32.1.1 Ownership of the Plant (including spare parts) to be imported into Pakistan shall be transferred to the Employer upon loading on to the</p>                                                                                                                                                                                                                                                                                              |

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|      | <p>mode of transport to be used to convey the Plant from the country of origin to that country.</p> <p>32.1.2 Ownership of the Plant (including spare parts) procured in Pakistan shall be transferred to the Employer when the Plant are brought on to the Site.</p> <p>32.1.3 Ownership of the Contractor's Equipment used by the Contractor and its Subcontractors in connection with the Contract shall remain with the Contractor or its Subcontractors.</p> <p>32.1.4 Ownership of any Plant in excess of the requirements for the Works shall revert to the Contractor upon Completion of the Works or at such earlier time when the Employer and the Contractor agree that the Plant in question are no longer required for the Works.</p> <p>32.1.5 Notwithstanding the transfer of ownership of the Plant, the responsibility for care and custody thereof together with the risk of loss or damage thereto shall remain with the Contractor until Risk Transfer Date of the Works or the part thereof in which such Plant are incorporated."</p>                                                                                                                                                                                                                                                                                         |
| 33.1 | <p><b><u>Terms of Payment</u></b></p> <p>33.1.1 The Employer shall pay the Contractor in the following manner and at the following times, on the basis of the Price Breakdown given in the section on Schedules of Price. Payments will be made in the currencies quoted by the Bidder unless otherwise agreed between the parties. Applications for payment in respect of part deliveries may be made by the Contractor as work proceeds.</p> <p><b>A. Terms of Payment</b></p> <p><b>(i) Plant, Equipment and Spare parts Supplied from Abroad</b></p> <p>In respect of plant and equipment supplied from abroad, the following payments shall be made:</p> <p><b>i. Advance Payment:</b> 10% of the total CIP Amount as an advance payment will be paid through LC upon presentation of following documents;</p> <p>a) Commercial invoice to be submitted within a week of L/C opening</p> <p>b) Acceptance of advance Payment Bank Guarantee issued by applicant (NGC).</p> <p><i>[Note: The process for opening of Letter of Credit and release of advance payment will be completed within 90 days from signing of Contract (provided the timelines on Contractor's part are adhered).]</i></p> <p><b>ii. On Shipment:</b> 79% of the CIP amount, price of goods shall be paid upon shipment and presentation of the following documents;</p> |

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|  | <p>a) Original and three copies of the Supplier's invoice showing Goods description, quantity, unit price and total amount.</p> <p>b) Three original and three copies of the negotiable clean, on board bill of landing marked "Freight prepaid" and three copies of nonnegotiable bill of landing.</p> <p>c) Original and three copies of the Packing list identifying contents of each package.</p> <p>d) Insurance Policy "The supplier must insure the goods in an amount equal to 110% of CIP price of the goods from warehouse to warehouse on all risks basis".</p> <p>e) Manufacturer's or Supplier's warranty certificate.</p> <p>f) Inspection certificate, issued by the nominated inspector(s).</p> <p>g) Certificate of origin issue by the chamber of commerce.</p> <p>h) Certificate that goods are new and not of used or second hand condition.</p> <p>i) Notice to deliver issued by NGC (if applicable).</p> <p>iii. <b>On Delivery:</b> 01% of the LC amount (the difference of CIP &amp; CIF) price of goods shall be paid upon delivery of material at site and upon presentation of the following documents;</p> <p>a) Commercial Invoice.</p> <p>b) Delivery Note signed by the applicant or its representative.</p> <p>iv. <b>On Acceptance:</b> 05% of the total CIP amount as balance payment will be paid through LC upon presentation of the following documents;</p> <p>a) Commercial Invoice.</p> <p>b) Project Completion Certificate issued by NGC.</p> <p>v. <b>On Acceptance:</b> 05% of the total CIP amount as balance payment will be paid through LC upon presentation of the following documents;</p> <p>a) Commercial Invoice.</p> <p>b) Project Operational Acceptance Certificate issued by NGC.</p> <p>(ii) <b>Plant, Equipment and Spare parts Supplied from within the Employer's Country</b></p> <p>In respect of plant and equipment supplied from within the Employer's country, the following payments shall be made:</p> <p>Ten percent (10%) of the total EXW amount as an advance payment against receipt of invoice, and an irrevocable advance payment security for the equivalent amount made out in favor of the</p> |
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|  | <p>Employer.</p> <p>Eighty percent (80%) of the total or pro rata EXW amount within forty-five (45) days after receipt of invoice for Goods upon submission of documents as specified in Clause 33.2 (3) of the Particular Conditions of Contract, duly verified by the Engineer and Employer.</p> <p>Hundred percent (100%) of the total Inland Transportation amount (i.e. specified in Sch-2) will be made upon delivery of the Goods to the Project's site within forty-five (45) days after receipt of invoice for Goods upon submission of documents as specified in Clause 33.2 (5) of the Particular Conditions of Contract, duly verified by the Engineer and Employer.</p> <p>Five percent (5%) of the total or pro rata EXW amount upon issue of the Completion/Taking Over Certificate, within forty-five (45) days after receipt of invoice and Five Percent (5%) upon completion of defect-liability Period.</p> <p>(iii) <b>Design Services</b></p> <p>In respect of design services for both the foreign currency and the local currency portions, the following payments shall be made:</p> <p>Ninety percent (90%) of the total or pro rata value of design services performed by the Contractor as evidenced by the acceptance of design by Project Manager/ Engineer, within forty-five (45) days after receipt of invoice and ten percent (10%) upon completion of defect-liability period.</p> <p>(iv) <b>Civil Works and Installation of Plant &amp; Other Services</b></p> <p>In respect of civil works and installation services, the following payments shall be made:</p> <p>Ten percent (10%) of the total value of civil works and installation services as an advance payment within thirty (30) days against receipt of invoice, and an irrevocable advance payment security for the equivalent amount made out in favor of the Employer.</p> <p>Eighty percent (80%) of the measured value of work performed by the Contractor, as identified in the said Program of Performance, during the preceding month, as evidenced by the Employer's authorization of the Contractor's application, will be made monthly within forty-five (45) days after receipt of invoice.</p> <p>Five percent (5%) of the total or pro rata value of civil works and installation services performed by the Contractor as evidenced by the Employer's authorization of the Contractor's monthly applications, upon issue of the Completion Certificate, within</p> |
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forty-five (45) days after receipt of invoice and five percent (5%) upon completion of defect-liability period.

(v) **Reimbursement of Duties, Indirect Taxes, and other local charges**

For any sum expended by the contractor in respect of custom duties and local indirect taxes shall be paid by the Employer within 45 days against submission of claim supported by documentary evidence acceptable to employer. The reimbursement of taxes will only be made if NGC's WEBOC system is used.

All payments will be subject to withholding taxes as per Income Ordinance, 2001/ International Tax Treaty & Sales Tax Act 1990. Further, payments shall be made only to those entities appearing in Active Taxpayer List (ATL) for both Income Tax & Sales Tax.

**(B) Payment Procedures**

The procedures to be followed in applying for certification and making payments shall be as follows:

**Summary of Procedure**

| Sr. # | Item                                            | Procedure                                     |
|-------|-------------------------------------------------|-----------------------------------------------|
| 1     | Plant & Spare parts from outside Pakistan       | Letter Of Credit/Direct Payment*              |
| 2     | Plant & Spare parts from within Pakistan        | Direct Payment                                |
| 3     | Design services                                 | Letter Of Credit/Direct Payment*              |
| 4     | Civil Works                                     | Direct Payment                                |
| 5     | Installation, Erection, Testing & Commissioning | Direct Payment                                |
| 6     | Custom Duties and taxes (on Imported items)     | Paid by Contractor and reimbursed by Employer |
| 7     | Sales tax (local items & services)              | Paid by Contractor and reimbursed by Employer |
| 8     | Local transportation                            | Direct Payment                                |

\* **Foreign Contractor** shall be paid by the Employer through irrevocable Letter of Credit opened in favour of the Contractor in a bank in its country, upon submission of documents specified herein.

**Local Contractor** shall be paid foreign currency component

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|  | <p>through inland letter of credit opened in favour of contractor in equivalent Pak Rs on parity rate (interbank TT selling) prevailing on the date of Bill of Lading. The date of bill of Lading should fall within the proposed schedule of delivery updated at the time of contract as per committed completion period. For Local currency component, local Contractor shall be paid through direct payment.</p> <p>(i) Charges for opening of Letter of Credit and amendments shall be borne by the Contractor. The currency of LC shall be the same as quoted in the bid.</p> <p>(ii) Irrevocable Letter of Credit will be established by CFO (NGC), 2<sup>nd</sup> Floor, Shaheen Complex, Egerton Road, Lahore within Seventy Five (75) days from the date of signing of Contract in any scheduled bank in Pakistan in favor of Contractor in a designated bank in his country. The timeline for the establishment of L/C will be as under:-</p> <ul style="list-style-type: none"> <li>• Within 15 days from issuance of Notification of Award/Letter of Acceptance, the Contractor will submit the following information to the Chief Financial Officer (NGC), Attention: Deputy Manager (L/C), 2<sup>nd</sup> Floor, Shaheen Complex, Egerton Road, Lahore under intimation to the Procuring Agency: <ul style="list-style-type: none"> <li>a. Signed and Stamped Copy of Notification of Award.</li> <li>b. Name &amp; Complete address of Beneficiary.</li> <li>c. Name &amp; complete address of Beneficiary Bank.</li> <li>d. Beneficiary's Bank Account Number &amp; Swift Code.</li> <li>e. Proforma Invoice in original duly signed/stamped including relevant payment terms. (Draft Proforma Invoice is attached as Form-19)</li> <li>f. Freight Breakup.</li> <li>g. No. of Packages.</li> <li>h. Weight and Measurement of goods.</li> <li>i. Port of Shipment.</li> <li>j. Volume.</li> <li>k. Expected Date of Shipment.</li> <li>l. Origin of Goods.</li> <li>m. Delivery Period.</li> <li>n. Relevant H.S Codes to be incorporated in the L/C</li> <li>o. Insurance Cover (if applicable)</li> </ul> </li> </ul> <p>(any other documents required by the L/C focal person -DM (L/C) NGC)</p> <ul style="list-style-type: none"> <li>• Draft LC from bank will be provided to Procuring Agency and Contractor by LC section within 07 days.</li> <li>• Draft will be got vetted from Contractor within 07 days, otherwise</li> </ul> |
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|  | <p>it will be considered as deemed approved. In this case, LC section will proceed for opening of LC as per Contract Agreement. Any amendment thereof shall be borne by the supplier.</p> <p>(iii) The Contractor shall pay the custom duties and other incidental charges through Manager (Custom Clearance &amp; Logistics) NGC, Karachi. The same shall be reimbursed to the Contractor as per actual.</p> <p>The Contractor will coordinate with Manager (Custom Clearance &amp; Logistics) NGC, Karachi for custom clearance and will be responsible and pay the charges for unloading and loading at sea port, inland transportation and insurance to the site/Employer ware house, storage at site and insurance. For purpose of clearance of material at port, the Contractor shall hire services of any NGC authorized clearing agent (appearing in NGC authorized agents list).</p> <p>(iv) Upon shipment of Plant from outside Pakistan, the contractor shall notify the Employer, Manager (Custom Clearance &amp; Logistics) NGC, Karachi, Pakistan and the Insurance Company by fax/cable the full details of the shipment, including Contract number, description of Goods, quantity, the vessel, the bill of lading number and date, port of loading, date of shipment, port of discharge, etc. The Contractor shall mail the following documents to the Employer and Manager (Custom Clearance &amp; Logistics) NGC, Karachi with a copy to the Insurance Company, in such a manner that the same are received by all concerned at least <b>15 days</b> before arrival of the Plant at the port or place of arrival. The Contractor will be responsible for any consequent expenses due to late receipt of the said documents.</p> <p>a) Copies of the Contractor's invoice showing Goods description, quantity, unit price and total amount.</p> <p>b) Original and four copies of the negotiable clean, on board bill of lading marked "freight prepaid" and four copies of non-negotiable bill of lading.</p> <p>c) Copies of the packing list identifying contents of each package.</p> <p>d) Insurance certificate.</p> <p>e) Manufacturer's or Supplier's Warranty certificate.</p> <p>f) Inspection certificate, issued by the nominated inspection agency and the manufacturer's factory inspection report, alongwith manufacturer's Warranty certificate.</p> |
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|      | <p>g) Certificate of origin.</p> <p>(v) For any sum paid by the Contractor in respect of custom duties and taxes in consequence of importation of Plant, shall be reimbursed by the Employer within the time mentioned in GCC Subclause 33.5 against presentation of acceptable claim supported by documentary evidence in original to the Employer. The expenses against this item shall be reimbursed from the amount of Provisional Sums provided in Schedule of Price No. 5 Grand Summary for this purpose.”</p> <p><b>33.1.2      <u>Retention of Payment</u></b></p> <p>If at any time any payment would fall due for Works or part of Works and, if there shall be any defect in part of such Works in respect of which such payment is proposed, the Employer may retain the whole or any part of such payment. Any sum retained by the Employer pursuant to the provisions of this Clause shall be paid to the Contractor after the said defect is removed.</p> <p><b>33.1.3      <u>Payment Where Taking-Over Certificate Issued for Section or Part of Works</u></b></p> <p>If any section or part of the Works shall be taken-over separately under Clause 29 (Taking-Over) hereof, the payments herein provided for on or after Taking-Over shall be made in respect of the section or part taken-over and reference to the price shall mean such part of the price as shall, in the absence of agreement, be apportioned thereto by the Project Manager/Engineer.</p> <p><b>33.1.4      <u>Extra Payment</u></b></p> <p>No extra payment in respect of overtime, additional materials, or special conditions or hardship shall be claimed by the Contractor unless otherwise provided in the Contract or such payments have been previously authorized in writing by the Project Manager/Engineer or the Employer.</p> <p><b>33.1.5      <u>Breakdown of Lump Sum Items</u></b></p> <p>For the purposes of statements to be submitted in accordance with Sub-Clause 33.1 hereof, the Contractor shall submit to the Project Manager/Engineer, within twenty eight (28) days after the receipt of the Letter of Acceptance, a breakdown for each of the lump sum items contained in the Bid. Such breakdowns shall be subject to the approval of the Project Manager/Engineer.</p> |
| 33.2 | <p><b><u>Method of Application</u></b></p> <p>Sub-Clause 33.2 is deleted and substituted by the following:</p> <p>(1) The Contractor shall submit to the Employer/Project Manager/Engineer</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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|  | <p>ten (10) copies of the Application for Certificate of Payment (invoices) each signed by the Contractor and in such form as the Employer/Project Manager/Engineer may from time to time prescribe. Application shall be accompanied by such invoices, receipts or other documentary evidence as the Engineer/Project Manager may from time to time require.</p> <p>(2) The Application for Certificate of Payment for progress of Work under Schedule of Price No. 4 shall be submitted after end of each month accompanying also a statement signed by the Contractor in the form acceptable to Employer or in such other form as the Engineer may from time to time prescribe showing the amounts to which the Contractor may consider himself to be entitled upto the end of the month in respect of:</p> <ul style="list-style-type: none"> <li>i. The permanent work executed.</li> <li>ii. Payment of account of lump sum item in the Price Schedule not included under head (i) above.</li> </ul> <p>(3) The Applications for Certificate of Payment for supply of Goods (Schedule of Price Nos. 1 &amp; 2) shall be submitted on the delivery of any Goods and shall also be accompanied by the following documents:</p> <ul style="list-style-type: none"> <li>a) Shipping Documents comprising of <ul style="list-style-type: none"> <li>i) Payment/Commercial Invoice</li> <li>ii) Clean on board Bill of Lading or airway bill issued by the freight forwarder (for imported Goods only)</li> <li>iii) Delivery Note/ Acknowledgement of the material receipt at site or at Employer designated Warehouses in case of Spare Parts</li> <li>iv) Packing list</li> <li>v) Certificate or Policy of Freight Insurance from Ex- factory to the Project Site or to Employer designated Warehouses in case of Spare Parts, of the portion of the Goods for which Certificate of Payment is requested</li> </ul> </li> <li>b) Certificate that the Goods complies with the Specifications</li> <li>c) Certificate of origin, issued by the Contractor</li> <li>d) Warranty Certificate</li> <li>e) Pre-shipment Inspection certificate/Inspection certificate or letter of waiver, issued by the Engineer.</li> <li>f) Any other document as considered necessary by the Engineer</li> </ul> <p>(4) The Application for Certificate of Payment shall state the amount claimed and shall set forth in detail, in the order of the Price Schedule, particulars of the Work executed up to the date named in the Application and subsequent to the period covered by the last preceding certificate, if any.</p> <p>(5) Any payment claims for Foreign Exchange part under Clause GCC 47.1 will be paid through direct payment procedure (Crossed Cheque) in equivalent PKR as per exchange rate applicable on date of payment.</p> |
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| 33.5 | <p><b><u>Payment</u></b></p> <p>Sub-Clause 33.5 is deleted and substituted by the following:</p> <p>“The amount due to the Contractor under any Interim Payment Certificate issued by the Project Manager/Engineer pursuant to this Clause, or to any other term of the Contract, shall, subject to Clause 27, be paid by the Employer to the Contractor within the period mentioned in Preamble to Conditions of Contract after such Interim Payment Certificate has been jointly verified by Employer and Contractor, or, in the case of the Final Certificate (referred to in Sub-Clause 33.10) within the period mentioned in Preamble to Conditions of Contract after such Final Payment Certificate has been jointly verified by Employer and Contractor.</p> <p>Deduction shall be made from the net amounts payable to the Contractor of any sum(s) in accordance with the prevalent Federal and/or Provincial laws, provided that no such deduction shall be made from those payments in respect of which the Contractor has obtained exemption under the Law.”</p>                                                                                                                                                                                                                                                                                                      |
| 33.6 | <p><b><u>Delayed Payment</u></b></p> <p>GCC Subclause 33.6 is deleted in its entirety.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 33.8 | <p><b><u>Payment by Measurement</u></b></p> <p>Actual quantities of civil works shall be finalized upon completion of final substation layout/orientation, and approval of civil works drawings.</p> <p><b><u>Work to be measured</u></b></p> <p>The Employer / Project Manager, shall, except as otherwise stated, ascertain and determine by measurement the value of the work done in accordance with the Contract and the Contractor shall be paid that value in accordance with this Clause. The Employer / Project Manager shall, when he requires any part of the Work to be measured, give reasonable notice to the Contractor, who shall:</p> <ul style="list-style-type: none"> <li>(a) forthwith attend or send a qualified representative to assist the Employer / Project Manager in making such measurement, and supply all particulars required by the Employer/ Project Manager</li> <li>(b) Supply all particulars required by the Employer/ Project Manager</li> </ul> <p>Should the Contractor not attend, or neglect or omit to send such representative, then the measurement made by the Employer/ Project Manager or approved by him shall be taken to be the correct measurement of such part of the Work. For the purpose of measuring such Work as are to be measured by records (including video records from WEBCAMS) and drawings, the Employer/</p> |

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|  | <p>Project Manager shall prepare records and drawings as the work proceeds and the Contractor, as and when called upon to do so in writing, shall, within fourteen (14) days, attend to examine and agree such records and drawings with the Employer/ Project Manager and shall sign the same when so agreed. If the Contractor does not attend to examine and agree such records and drawings, they shall be taken to be correct. If, after examination of such records and drawings, the Contractor does not agree the same or does not sign the same as agreed, they shall nevertheless be taken to be correct, unless the Contractor, within fourteen (14) days of such examination, lodges with the Employer/ Project Manager notice of the respect in which such records and drawings are claimed by him to be incorrect. On receipt of such notice, the Employer/ Project Manager shall review the records and drawings and either confirm or vary them.</p> <p><b><u>Method of Measurement</u></b></p> <p>The Work shall be measured net, notwithstanding any general or local custom, except where otherwise provided for the Contract.</p>                                                                                                                                                                                                                                                                 |
|  | <p><b><u>Sub-Clause 33.12 Withholding of Payment</u></b></p> <p>New Sub-Clause 33.12 is added as given below:</p> <p>If the Works or any parts thereof are not being carried out to the Project Manager/Engineer's satisfaction and in order to protect the Employer from loss on account of:</p> <ul style="list-style-type: none"> <li>(a) defective work not rectified</li> <li>(b) claims filed against the Contractor</li> <li>(c) failure of the Contractor to make payments due for Plant procured or labour employed by him</li> <li>(d) damage to any other contractor employed by the Employer</li> <li>(e) Contractor's non-compliance with the Contract</li> <li>(f) any Government dues recoverable from the Contractor if notified by the Government</li> <li>(g) Any other reason as deemed necessary by the Employer, for substantiation of invoice.</li> </ul> <p>The Project Manager/Engineer may notify withholding of such payments or part thereof as may, in his opinion, be related to the aforesaid reasons/ grounds. When the reasons/grounds for withholding the payment are removed by the Contractor, the Project Manager/Engineer shall upon being satisfied to that effect issue Certificate of Payment in respect of withheld amounts without markup and penalty.</p> <p>In addition, the Employer/Engineer reserves right to withhold Contractor's payment on following accounts.</p> |

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|       | <p>a) Notwithstanding the terms of Clause 33.1 or any other Clause of the Contract, no amount will be certified by the Engineer for payment/paid by Employer until the Performance Security/ Advance Payment Security, if required under the Contract, has been provided by the Contractor, approved by the Employer and is valid for the required duration stated in the Contract.</p> <p>b) Employer reserves the right to withhold the payments in case of Contractor's non-compliance with reporting requirements under Clause-26.4 and insurance requirements under Clause 43 of Conditions of Contract.</p> <p>c) If there is any ambiguity in the payment/claim or Interim Payment Certificate, the Employer may withheld the payment to such extent and may process the remaining amount. In such case, the withheld amount may be included in the next Payment Certificate alongwith clarification for ambiguity pointed out by Employer.</p> <p>d) In case of Contractor's non-compliance with the laws/regulations of the tax authorities' (Federal/Provincial), the Employer reserves the right to withhold the payments for ensuring the necessary compliance.</p> <p>e) In case the Engineer determines that the Contractor do not possess sufficient T&amp;P as per requirements of works/tender documents, He has right to withhold the payments.</p> <p>Any delay in payments due to aforementioned provisions do not give any right to Contractor for Remedies under Clause 26.1 and 33.7.</p> |
|       | <u>Subclauses GCC 33.13 and GCC 33.14 are added as follows:</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 33.13 | No payment made by the Employer herein shall be deemed to constitute acceptance by the Employer of the Works or any part(s) thereof.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 33.14 | <p><b>Payments Due from Contractor for non- compliance</b></p> <p>Employer may, without prejudice to any other method of recovery, deduct the amount due from any money is his hand due to or which may become due to the Contractor or recover same through the Performance Security as per the provisions of the contract. . Such deduction shall not relieve the Contractor from his obligations to complete the Work in accordance with the Contract to the satisfaction of the Employer.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

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| 35.2 | <p><b><u>Currency Restrictions</u></b></p> <p>The text of Sub-Clause 35.2 is deleted and substituted by the following:</p> <p>“Any required foreign currency transactions shall be met by the Contractor at his cost from his own resources.”</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 35.3 | <p><b><u>Rates of Exchange</u></b></p> <p>The text of Sub-Clause 35.3 is deleted and substituted by the following:</p> <p>“Any import, if required and approved by the Employer shall also be paid in local currency with exchange rate for the period as notified by the National Bank of Pakistan.”</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 36.4 | <p><b><u>Payment against Provisional Sums</u></b></p> <p>Sub-Clause 36.4 is deleted and substituted by the following:</p> <p>“Provisional Sum if any will be expended on the direction of the Engineer through Variation Orders which would be valued in accordance with the provisions of Clause 31 Conditions of Contract.”</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 37.2 | <p><b><u>Employer's Risks</u></b></p> <p>The text of Sub-Clause 37.2 is deleted and substituted by the following:</p> <p>“The Employer's Risks are:</p> <ul style="list-style-type: none"> <li>(a) (Insofar as they relate to Pakistan) war and hostilities (whether war be declared or not), invasion, act of foreign enemies</li> <li>(b) (Insofar as they relate to Pakistan) rebellion, revolution, insurrection, military or usurped power or civil war</li> <li>(c) ionizing radiation or contamination by radioactivity from any nuclear fuel, radio-active toxic explosives or other hazardous properties of any explosive nuclear assembly or nuclear components thereof</li> <li>(d) pressure waves caused by aircraft travelling at sonic or supersonic speed</li> <li>(e) (Insofar as they relate to Pakistan) riot, commotion or disorder, unless solely restricted to the employees of the Contractor or of his Subcontractors</li> <li>(f) use or occupation of the Work or any part thereof by the Employer</li> </ul> |

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|      | <p>(g) fault, error, defect or omission in the design of any part of the Works by the Engineer, Employer or those for whom the Employer is responsible for which the Contractor has disclaimed responsibility in writing within a reasonable time after the receipt of such design</p> <p>(h) the use or occupation of the Site by the Works or any part thereof, or for the purposes of the Contract: or interference, whether temporary or permanent with any right of way, light, air or water or with any easement, way leaves or right of a similar nature which is the inevitable result of the construction of the Works in accordance with the Contract</p> <p>(i) the right of the Employer to construct the Works or any part thereof on, over, under, in or through any land</p> <p>(j) damage (other than that resulting from the Contractor's method of construction) which is the inevitable result of the construction of the Works in accordance with the Contract</p> <p>(k) the act, neglect or omission or breach of contract or of statutory duty of the Engineer, the Employer or other contractors engaged by the Employer or of their respective employees or agents."</p> |
| 39.2 | <p><b><u>Loss or Damage Before Risk Transfer Date</u></b></p> <p>The words "by arbitration under Clause 50" are deleted and substituted by the words "by the Project Manager/ Engineer".</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 39.4 | <p>New Sub-Clause 39.4 is added as given below:</p> <p><b><u>Duty to Minimize Delay</u></b></p> <p>Each Party shall at all times use all reasonable endeavors to minimize any delay in the Performance of the Contract as a result of Risks.</p> <p>The Contractor shall give notice to the Employer and vice versa the Employer shall give notice to the Contractor in case of foreseeable delay by the Risks.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 40.1 | <p><b><u>Contractor's Liability</u></b></p> <p>The text of Sub-Clause 40.1 is deleted and substituted by the following:</p> <p>40.1.1 Except as provided under Sub-Clause 41.1, the Contractor shall be liable for and shall indemnify the Employer against all losses, expenses and claims in respect of any loss of or damage to physical</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |



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|      | <p>property (other than the Works), death or personal injury occurring before the issue of the last Defects Liability Certificate to the extent caused by:</p> <p>(a) defective design, material or workmanship of the Contractor, or</p> <p>(b) negligence or breach of statutory duty of the Contractor, his Subcontractors or their respective employees and agents.</p> <p>40.1.2 If any proceedings are brought or any claim is made against the Employer that might subject the Contractor to liability under GCC Subclause 40.1.1, the Employer shall promptly give the Contractor a notice thereof and the Contractor may at its own expense and in the Employer's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim. If the Contractor fails to notify the Employer within 28 days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Employer shall be free to conduct the same on its own behalf. Unless the Contractor has so failed to notify the Employer within the 28-day period, the Employer shall make no admission that may be prejudicial to the defense of any such proceedings or claim. The Employer shall, at the Contractor's request, afford all available assistance to the Contractor in conducting such proceedings or claim, and shall be reimbursed by the Contractor for all reasonable expenses incurred in so doing.</p> |
| 40.2 | <p><b><u>Employer's Liability</u></b></p> <p>The text of Sub-Clause 40.2 from the words "or of death or personal injury" to the end of the Sub-Clause, is deleted and substituted by the following:</p> <p>"..... (other than the Works) or of death or personal injury to the extent caused by any of the Employer's Risks listed in paragraphs (f), (g), (h), (i), (j), and (k) of Sub-Clause 37.2 but not otherwise."</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 42.1 | <p><b><u>Limitations of Liability</u></b></p> <p><u>Following Subclause 42.1 € is added at the end of GCC 42.1:</u></p> <p>"(c) in case of criminal negligence or willful misconduct."</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 42.2 | <p><b><u>Maximum Liability</u></b></p> <p>the words "the sum stated in the Preamble to Conditions of Contract or if no such sum is stated" appearing in 2<sup>nd</sup> line of Sub-Clause are deleted.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 42.6 | <p><b><u>Foreseen Damage</u></b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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|        | Sub-Clause 42.6 is deleted in its entirety.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|        | <p><u>Subclause 43.0 is added under the heading “Insurance” as follows:</u></p> <p>43.0.1 To the extent specified herein, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurances set forth below in the sums and with the deductibles and other conditions specified herein. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, who should not unreasonably withhold such approval.</p> <p>43.0.2 The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to this clause, except for the Third Party Liability, Employees, and Employer’s Liability Insurances, and the Contractor’s Subcontractors shall be named as co-insureds under all insurance policies taken out by the Contractor pursuant to this Clause except for the Marine Insurance of Plant and Employees. All insurer’s rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies</p> <p>43.0.3 The Contractor shall ensure that, where applicable, its Subcontractor(s) shall take out and maintain in effect adequate insurance policies for their personnel and vehicles and for work executed by them under the Contract, unless such Subcontractors are covered by the policies taken out by the Contractor.</p> |
| 43.1.1 | <p><u>The following further Sub-Clauses are 43.1.1, 43.1.2 and 43.1.3 are added:</u></p> <p><b><u>Marine Insurance of Plant</u></b></p> <p>(1) The Contractor shall in the joint names of the Contractor and the Employer, obtain Marine Cargo All Risks Insurance to cover loss or damage to the Plant or part thereof during transport.</p> <p>(2) The insurance for each consignment of Plant or part thereof shall attach from the time the Plant or part thereof leave the warehouse or place of storage and terminate after ninety (90) days on its completion of unloading at the Site or until insurance survey whichever occurs first. Upon arrival of each consignment at the Site, the Contractor shall, immediately arrange insurance survey by the insurance company.</p> <p>(3) The sum insured for imported Plant or part thereof shall be for its full replacement value at the Site i.e. 100 % CIP value at the Site for each consignment of the Plant or part thereof plus not less than 30 % of CIP value at the Site to cover any additional costs resulting from loss or</p>                                                                                                                                                                                                                                                                                                                                                                                                                        |

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|        | <p>damage thereof.</p> <p>(4) The Insurance Policy for imported Plant etc. shall be on “All Risks” basis and shall not be limited to the attachment/endorsement of following clauses:</p> <ul style="list-style-type: none"> <li>(a) Institute Cargo Clauses (A)</li> <li>(b) Institute War Clauses (Cargo)</li> <li>(c) Institute Strikes Clauses (Cargo)</li> <li>(d) Institute Cargo Clauses (Air) excluding sending by Post</li> <li>(e) Institute War Clauses (Air Cargo) excluding sending by Post.</li> <li>(f) Institute Strikes Clauses (Air Cargo)</li> <li>(g) Special Replacement Clauses (Air)</li> <li>(h) Institute Theft, Pilferage and Non-delivery Clauses</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 43.1.2 | <p><b><u>Erection/Construction All Risks Insurance</u></b></p> <p>(1) The Contractor shall insure the Works or part thereof in the joint names of the Contractor and the Employer.</p> <ul style="list-style-type: none"> <li>a. from the date following the completion of the first unloading at the Site of the Plant or part thereof and other materials (to be used for construction or erection) and from commencement of Works at Site until the Risk Transfer Date against any loss or damage caused by any of the Contractor’s risks and any other risks specified in Sub-Clause 43.1.(a) above and</li> <li>b. during the Defects Liability Period against any loss or damage which is caused either: <ul style="list-style-type: none"> <li>(i) by the Contractor in completing any outstanding work or complying with his obligations under Clause 30, or</li> <li>(ii) by any of the Contractor’s risks and any other risks specified in Sub-Clause 43.1(a) above, which occurred prior to the Risk Transfer Date.</li> </ul> </li> </ul> <p>(2) The sum insured shall be the full replacement value at the Site, which includes:</p> <ul style="list-style-type: none"> <li>(a) (i) FOB value of imported Plant to be erected</li> </ul> |

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|        | <p>(ii) Ex-factory value of Indigenous Plant to be erected, if any</p> <p>(b) freight and insurance including local transport</p> <p>(c) customs duties and taxes etc.</p> <p>(d) cost of erection</p> <p>(e) cost of civil engineering work including escalation</p> <p>(f) clearance of debris, maximum @ 5 % of minimum amount of Third Party Liability Insurance</p> <p>Plus 30% to cover any additional costs resulting from loss or damage thereof.</p>                                                                |
| 43.1.3 | <p><b><u>General</u></b></p> <p>Should a loss be sustained, the Contractor shall replace or repair any loss or damage at his own cost and complete the Works in accordance with the Contract as soon as possible after occurrence of such loss or damages, without waiting for the settlement of the insurance claim."</p>                                                                                                                                                                                                   |
| 43.2   | <p><b><u>Contractor's Equipment</u></b></p> <p>Sub-Clause 43.2 is deleted and substituted by the following:</p> <p>"The Contractor shall insure the Contractor's Equipment for its full replacement value while on the Site against all loss or damage caused by any of the Contractor's Risks."</p>                                                                                                                                                                                                                         |
| 43.7   | <p><b><u>Remedies on the Contractor's Failure to Insure</u></b></p> <p>In 3<sup>rd</sup> line after the word, "purpose", the expressions- "and reasonable costs including the man-hours costs of Employer's Personnel" are added.</p>                                                                                                                                                                                                                                                                                        |
| 43.9   | <p>New Sub-Clauses 43.9 to 43.12 are added as follows:</p> <p><b><u>Currency of Insurance</u></b></p> <p>"All policies of Insurance of the Plant shall provide for payment of indemnity to be made in such amounts as will allow making good of loss of or damage to the whole or any part of the Works preferably PKR."</p>                                                                                                                                                                                                 |
| 43.10  | <p><b><u>Contractor to Notify</u></b></p> <p>"It shall be the duty of the Contractor to notify the insurers of any such insurances referred to above of any matter or event which by the terms of such insurances are required to be so notified. All formalities in connection with insurance survey(s) shall be the sole responsibility of the Contractor. The Contractor shall indemnify and keep indemnified Employer against all loss, claims, demands, proceedings, costs, charges and expenses whatsoever arising</p> |

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|       | <p>out of or resulting from any default by the Contractor in complying with the requirements of this Sub-Clause whether as a result of the avoidance of any such insurance or otherwise.</p> <p>In case of any insurance claim, the Contractor shall pursue the insurance claim if any, till such time final settlement of such insurance claims is effected.”</p>                                                                                                                                                               |
| 43.11 | <p><b><u>Procurement of Insurance Policies</u></b></p> <p>The Contractor shall procure and submit the insurance cover before Date of Commencement. Further, in case of delay, the Employer reserves the right to procure the insurance policies at risk and cost of the Contractor.</p> <p>In case of loss incurred during absence of insurance cover, the Contractor shall be fully responsible to indemnify the Employer from any such event as per sums which would have otherwise been recoverable from insurance cover.</p> |
| 43.12 | <p><b><u>Insurance Company</u></b></p> <p>All insurances shall be affected with either National Insurance Company of Pakistan or any other insurance company operating in Pakistan and acceptable to the Employer.</p>                                                                                                                                                                                                                                                                                                           |
| 44.1  | <p><b><u>Force Majeure</u></b></p> <p><u>The words “and which are unavoidable notwithstanding the reasonable care of the party affected,”</u> are added in the first line after the word “the parties”.</p> <p>Text in sub-para (b) is deleted and para (c) and (d) are re-numbered as (b) and (c).</p>                                                                                                                                                                                                                          |
| 44.6  | <p><b><u>Damage Caused by Force Majeure</u></b></p> <p>At the end of the Sub-Clause 44.6 the following is added:</p> <p>“However the Contractor shall put up his claim to the Employer / Engineer with full details and justification.”</p>                                                                                                                                                                                                                                                                                      |
| 44.8  | <p><b><u>Payment on Termination for Force Majeure</u></b></p> <p>Text in sub-para (c) is deleted and para (d) and (e) are re-numbered as (c) and (d).</p> <p>New Sub-para € shall be added as follows:</p> <p>In calculating any monies due from the Employer to the Contractor, account shall be taken of any sum previously paid by the Employer to the Contractor under the Contract, including any advance payment paid pursuant to clause 33.1 (Terms of payment) of the contract agreement</p>                             |

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| 44.10  | <p><b><u>Force Majeure Affecting Engineer's Duties</u></b></p> <p>Sub-Clause 44.10 is deleted in its entirety.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 45.2   | <p><b><u>Contractor's Default</u></b></p> <p><u>Text of subclause is numbered as sub-para 45.2.1 and the following sub-para 45.2.2 is added:</u></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 45.2.2 | <p>Upon receipt of the notice of termination under GCC Subclauses 45.2.1 or 42.2.2, the Contractor shall, either immediately or upon such date as is specified in the notice of termination,</p> <ul style="list-style-type: none"> <li>(a) cease all further work, except for such work as the Employer may specify in the notice of termination for the sole purpose of protecting that part of the Works already executed, or any work required to leave the Site in a clean and safe condition;</li> <li>(b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) below;</li> <li>(c) deliver to the Employer the parts of the Works executed by the Contractor up to the date of termination;</li> <li>(d) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Works and to the Plant as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors; and</li> <li>(e) deliver to the Employer all drawings, specifications and other documents prepared by the Contractor or its Subcontractors as of the date of termination in connection with the Works.</li> </ul> <p>The Employer or such other contractor may use for such completion any Contractor's Equipment which is upon the Site as he or they may think proper, and the Employer shall pay the Contractor a reasonable compensation for such use.</p> |
| 45.4   | <p><b><u>Payment after Termination</u></b></p> <p>The text of subclause is replaced with following:</p> <p>"The Employer shall not be liable to make any further payments to the Contractor until the Works have been completed. When the Works are so complete, the Project Manager/Engineer shall certify the total cost of such completion of Works.</p> <p>The Employer may recover the extra cost of such completion, as certified by the Project Manager/Engineer, from any sums otherwise due and payable to the Contractor and/or by disposing of the Contractor's Equipment and stores taken over by the Employer under this Clause or as otherwise provided by law. If</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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|      | <p>there is no such extra cost the Employer shall pay any balance due to the Contractor.”</p> <p>In calculating extra cost of such completion, account shall be taken of any sum previously paid by the Employer to the Contractor under the Contract, including any advance payment paid pursuant to clause 33.1 (Terms of payment) of the contract agreement.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|      | <p><u>New Sub-Clause 45.6 is added as follows:</u></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 45.6 | <p><b><u>Integrity Pact</u></b></p> <p>If the Contractor, or any of his Subcontractors, agents or servants is found to have violated or involved in violation of the Integrity Pact signed by the Contractor as Schedule-J to his Bid, then the Employer shall be entitled to:</p> <ul style="list-style-type: none"> <li>(a) recover from the Contractor an amount equivalent to ten times the sum of any commission, gratification, bribe, finder’s fee or kickback given by the Contractor or any of his Subcontractors, agents or servants;</li> <li>(b) terminate the Contract; and</li> <li>(c) recover from the Contractor any loss or damage to the Employer as a result of such termination or of any other corrupt business practices of the Contractor or any of his Subcontractors, agents or servants.</li> </ul> <p>The termination under Sub-Para (b) of this Sub-Clause shall proceed in the manner prescribed under Sub-Clauses 45.2 to 45.5 and the payment under Sub-Clause 45.4 shall be made after having deducted the amounts due to the Employer under Sub-Para (a) and (c) of this Sub-Clause.</p> |
| 46.1 | <p><b><u>Employer’s Default</u></b></p> <p>The comma and the word “or” at the end of paragraph (d) of Sub-Clause 46.1 are deleted and substituted by period (.) Paragraph € of Sub-Clause 46.1 is deleted.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 46.3 | <p><b><u>Payment on Termination for Employer’s Default</u></b></p> <p>The words “including loss of profit” in the second paragraph of Sub-Clause 46.3 are deleted.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 47.1 | <p><u>The title and text of subclause are deleted and substituted with following:</u></p> <p>The formula/ guidelines issued by Pakistan Engineering Council (PEC) in May 2022 and or any latest version issued by PEC shall be applicable. The indices and the factors for price adjustment shall be decided by the Engineer for each type of work as per PEC guidelines for each type/nature of goods/equipment/consulting and non-consulting services etc.</p> <p>Contract prices for items not covered/addressed by PEC guidelines shall be</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

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|      | <p>adjustable as per formula given in Appendix-F to PC.</p> <p>If the currency in which Contract Price is expressed is different from the currency of the country of origin of the materials indices, a correction factor shall correspond to the ratio of exchange rates between two currencies on the date for adjustment and base date as defined above.</p> <p><u>Any price adjustment claims against the subject Clause will be paid to the EPC Contractor in Pakistan in equivalent Pak Rupees on the date of payment in Pakistan.</u></p>                                                      |
| 47.2 | <p>Following clause 47.2 is added and existing clause 47.2 is re-numbered as 47.3.</p> <p>(The formula/guidelines issued by Pakistan Engineering Council (PEC) in May 2022 and or any latest version issued by PEC shall be applicable. The indices and the factors for price adjustment shall be decided by the Engineer for each type of work as per PEC guidelines for each type/nature of goods/equipment/consulting and non-consulting services etc.)</p> <p>Contract prices for items not covered/addressed by PEC guidelines shall be adjustable as per formula given in Appendix-F to PC.</p> |
| 48.1 | <p><b><u>Customs and Import Duties</u></b></p> <p>The Contractor shall pay all customs, import duties and taxes in consequence of the importation of the plant and Employer will reimburse it on actual basis.</p>                                                                                                                                                                                                                                                                                                                                                                                    |
| 48.3 | <p>Following Sub-Clauses 48.3 to 48.5 are added:</p> <p><b><u>Port Charges and Port Congestion</u></b></p> <p>The Contractor shall be deemed to have obtained all the information regarding facilities and charges, in respect of port clearance, loading and unloading, storage, transportation, congestion and confirmed the requirements thereof at his own responsibility and all such costs and charges are deemed to be included in the rates and prices of the Schedule of Prices.</p>                                                                                                         |
| 48.4 | <p>If any tax exemptions, reductions, allowances, or privileges may be available to the Contractor in Pakistan, the Employer shall use its best endeavors to enable the Contractor to benefit from any such tax savings to the maximum allowable extent.</p>                                                                                                                                                                                                                                                                                                                                          |
| 48.5 | <p>For the purpose of the Contract, it is agreed that the Contract Price specified in the Contract Agreement is based on the taxes, duties, levies, and charges prevailing at the date 28 days prior to the date of bid submission in Pakistan (hereinafter called "Tax" in this GCC Subclause 48.5). If any rates of Tax are increased or decreased, a new Tax is introduced, an existing Tax is abolished, or</p>                                                                                                                                                                                   |



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|  | any change in interpretation or application of any Tax occurs in the course of the performance of Contract, which was or will be assessed on the Contractor, Subcontractors, or their employees in connection with performance of the Contract, an equitable adjustment of the Contract Price shall be made to fully take into account any such change by addition to the Contract Price or deduction therefrom, as the case may be, in accordance with GCC Clause 47.2 hereof.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|  | <p><u>Sub-Clause 49.1 Notice to Contractor</u></p> <p>The following is added at the end of Sub-Clause 49.1:</p> <p>“For the purposes of Sub-Clause 49.1 the Contractor shall, immediately after receipt of Letter of Acceptance, intimate in writing to the Employer and the Engineer by registered post, the address of his principal place of business or any change in such address during the period of the Contract.”</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|  | <p><u>Sub-Clause 50 Disputes &amp; Arbitration</u></p> <p>Clause 50 is deleted and in its place the following Sub-Clauses 50.1 to 50.5 are inserted:</p> <p>50.1 If a dispute of any kind whatsoever arises between the Employer and the Contractor in connection with, or arising out of, the Contract or the execution of the Works, whether during the execution of the Works or after their completion and whether before or after repudiation or other termination of the Contract, including any dispute as to any opinion, instruction, determination, certificate or valuation of the Project Manager/Engineer, the matter in dispute shall, in the first place, be referred in writing to the Project Manager/Engineer, with a copy to the other party. Such reference shall state that it is made pursuant to this Clause. No later than the fifty sixth (56) day after the day on which he received such reference, the Project Manager/Engineer shall give notice of his decision to the Employer and the Contractor. Such decision shall state that it is made pursuant to this Clause.</p> <p>Unless the Contract has already been repudiated or terminated, the Contractor shall, in every case, continue to proceed with the Work with all due diligence, and the Contractor and the Employer shall give effect forthwith to every such decision of the Project Manager/Engineer unless and until the same shall be revised, as hereinafter provided in an amicable settlement or in an arbitral award.</p> <p>In any case where the Conditions of Contract provide that the decision of the Project Manager/Engineer is to be final and</p> |

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|      | <p>conclusive, such decision shall not be referable to arbitration under this Clause nor shall the same be questioned in any other form of proceedings whatsoever.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 50.2 | <p>If either the Employer or the Contractor be dissatisfied with a decision of the Project Manager/Engineer or if the Project Manager/Engineer fails to give notice of his decision on or before the fifty sixth (56) day after the day on which he received the reference, then either the Employer or the Contractor may, on or before the twenty eighth (28) days after the day on which the said period of fifty six (56) days expired, as the case may be, give notice to the other party to commence arbitration, as hereinafter provided, as to the matter in dispute. Such notice shall establish the entitlement of the party giving the same to commence arbitration, as hereinafter provided, as to such dispute and, subject to Sub-Clause 50.5, no arbitration in respect thereof may be commenced unless such notice is given.</p> <p>If the Project Manager/Engineer has given notice of his decision as to a matter in dispute to the Employer and the Contractor and no notification of intention to commence arbitration as to such dispute has been given by either the Employer or the Contractor on or before the twenty eighth (28) day after the day on which the parties received notice as to such decision from the Project Manager/Engineer the said decision shall become final and binding upon the Employer and the Contractor.</p> |
| 50.3 | <p>Where notice of intention to commence arbitration as to a dispute has been given in accordance with Sub-Clause 50.2, arbitration of such dispute shall not be commenced unless an attempt has first been made by the parties to settle such dispute amicably through mutual negotiation within ninety (90) days from the date of notification of Project Manager/Engineer's decision.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 50.4 | <p>Any dispute in respect of which:</p> <p>(a) the decision, if any, of the Project Manager/Engineer has not become final and binding pursuant to Sub-Clause 50.1 and</p> <p>(b) amicable settlement has not been started/reached within the period stated in Sub-Clause 50.3</p> <p>shall be finally settled, unless otherwise specified in the Contract, under the Rules of Pakistan Arbitration Act, 1940 (Act No. X of 1940) and Rules made thereunder as amended, by one or more arbitrators appointed under such Rules.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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|                  | <p>The said arbitrator(s) shall have full power to open up, review and revise any decision, opinion, instruction, determination, certificate or valuation of the Project Manager/Engineer for the purpose of obtaining said decision pursuant to Sub-Clause 50.1. No such decision shall disqualify the Project Manager/Engineer from being called as a witness and giving evidence before the arbitrator(s) on any matter whatsoever relevant to the dispute.</p> <p>The venue of arbitration proceedings shall be the place in Pakistan as mentioned in the Preamble to Conditions of Contract.</p> <p>50.5 Where neither the Employer nor the Contractor has given notice of intention to commence arbitration of a dispute within the period stated in Sub-Clause 50.1 or 50.2 and the related decision has become final and binding, either party may, if the other party fails to comply with such decision, and without prejudice to any other rights it may have, refer the failure to arbitration in accordance with Sub-Clause 50.4. The provisions of Sub-Clauses 50.1 to 50.2 shall not apply to any such reference."</p> |
|                  | <p><u>Following clauses 52 to 56 are added:</u></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <p><b>52</b></p> | <p><b>Liens</b></p> <p>Each contractor, for himself and for any persons directly or indirectly responsible to him, and for his or their material, equipment and employees, and for all other persons performing any labor or furnishing any labor or material for any/or all of the Work covered by his Contract, will be required to release or waive, to the full extent permitted by law, all mechanical and other liens, for or on account of the Work done or equipment and material furnished hereunder and the improvements or structures herein same may be incorporated, and the land to which they are appurtenant shall at all times be free and clear of all such liens</p>                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <p><b>53</b></p> | <p><b>Taxes and Duties</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <p>53.1</p>      | <p>Except as otherwise specifically provided in the Contract, the Contractor shall bear and pay all taxes, duties, levies, and charges assessed on the Contractor, its Subcontractors, or their employees by all municipal, state, or national government authorities in connection with the Works in and outside of Pakistan. If Contractor is joint venture, it may authorize one partner to bear taxes, duties, levies and charges assessed on its behalf provided that the liability of the Contractor shall remain binding on it.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <p>53.2</p>      | <p>Notwithstanding GCC Sub-Clause 53.1 above, the Employer shall reimburse to the Contractor, all customs and import duties as well as other local taxes like, e.g., a value added tax (VAT), imposed by the law of Pakistan on the Plant</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

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|      | <p>specified in Schedule of Price No. 1 and that are to be incorporated into the Works on actual basis (without overhead and profits) within forty five (45) days against presentation of acceptable claim submitted to the Employer, supported by documentary evidence, from the Provisional Sums provided in the Schedules of Price.</p> <p>General Sales tax, Provincial sales Tax and all other taxes payable by the Contractor in Pakistan on the Plant specified in Schedule of Price No. 2, 3 &amp; 4 that are to be incorporated into the Works shall be reimbursed by the Employer on actual basis (without overhead and profits) within forty five (45) days against presentation of acceptable claim submitted to the Employer, supported by documentary evidence, from the Provisional Sums provided in the Schedule of Price, provided that such reimbursements shall be subject to Withholding as per rules mentioned in respective federal and provincial laws of Employer's country and provided further that the contractor is registered with relevant Tax Authority(ies) and Employer can claim input from relevant Tax Authority(ies).</p> <p>The reimbursement of taxes will only be made if Employer's WEBOC system is used.</p> |
| 53.3 | <p>If any tax exemptions, reductions, allowances, or privileges may be available to the Contractor in Pakistan, the Employer shall use its best endeavors to enable the Contractor to benefit from any such tax savings to the maximum allowable extent. Further, any Tax Treatise will be considered between Employer's country and Contractor's country (if applicable).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 53.4 | <p>For the purpose of the Contract, it is agreed that the Contract Price specified in Contract Agreement is based on the taxes, duties, levies, and charges prevailing at the date 28 days prior to the date of bid submission in Pakistan (hereinafter called "Tax" in this GCC Subclause 53.4). If any rates of Tax are increased or decreased, a new Tax is introduced, an existing Tax is abolished, or any change in interpretation or application of any Tax occurs in the course of the performance of Contract, which was or will be assessed on the Contractor, Subcontractors, or their employees in connection with performance of the Contract, an equitable adjustment of the Contract Price shall be made to fully take into account any such change by addition to the Contract Price or deduction therefrom, as the case may be, in accordance with GCC Clause 47.2 hereof.</p>                                                                                                                                                                                                                                                                                                                                                        |
| 53.5 | <p><b>Tax Provisions in Subcontracts</b></p> <p>Provisions to the like effect as those contained in this Clause shall be incorporated in Subcontracts.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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| 54  | <p><b>Liability of the Contractor</b></p> <p>The Contractor or his Subcontractors or assigns shall follow strictly, all relevant labour laws including the Workmen's Compensation Act and the Employer shall be fully indemnified for all claims, damages etc. arising out of any dispute between the Contractor, his Subcontractors or permitted assigns and the labour employed by them.</p>                                                                                                                                                                                                                               |
| 55. | <p><b>Joint and Several Liability</b></p> <p>If the Contractor is a joint venture of two or more persons, all such persons shall be jointly and severally bound to the Employer for the fulfilment of the terms of the Contract and shall designate one of such persons to act as leader with authority to bind the joint venture. The composition or the constitution of the joint venture shall not be altered without the prior consent of the Employer.</p>                                                                                                                                                              |
| 56. | <p><b>Details to be Confidential</b></p> <p>The Contractor shall treat the details of the Contract as private and confidential, save in so far as may be necessary for the purposes thereof, and shall not publish or disclose the same or any particulars thereof in any trade or technical paper or elsewhere without the prior consent in writing of the Employer or the Project Manager/Engineer. If any dispute arises as to the necessity of any publication or disclosure for the purpose of the Contract, the same shall be referred to the decision of the Project Manager/Engineer whose award shall be final.</p> |

## Appendix F - Price Adjustment

### Price Adjustment Formula for Schedule No. 1 - Plant (including Mandatory Spare Parts) Supplied from abroad and Schedule No. 2 Plant (including Mandatory Spare Parts) Supplied from within Employer's Country

Prices payable to the Contractor, in accordance with the Contract, shall be subject to adjustment during performance of the Contract to reflect changes in the cost of material components, in accordance with the following formula:

The Contract Price shall be adjusted for the local/foreign currency prices of only the following material components stated in Schedule No.1 - Plant (including Mandatory Spare Parts Supplied from Abroad) and Schedule No. 2 - Plant (including Mandatory Spare Parts Supplied from within the Employer's Country) of the Price Schedules for any increase or decrease in the costs:

- a) Rate of Steel for Steel Lattice Towers including Stubs, EHS Shield Wire, Steel Core of ACSR conductor and steel part of Alumoweld OPGW
- b) Rate of Aluminum of ACSR conductor and Aluminum part of OPGW

No increase in the price of each of the above mentioned components will be allowed beyond the scheduled delivery/shipment period of respective Plant if the price increase is because of reasons attributable to the Contractor. The escalation for each component shall be according to the scheduled completion of that item provided however that the extension is granted pursuant to GCC Clause 40. For the avoidance of doubt, the price adjustment regarding supply of Plant received later than the scheduled period, shall continue to be paid at the revised rate of the constituent prevailing on the date of its scheduled delivery. The Employer will, however, be entitled to any price decrease occurring during such period of delays. Each claim shall be supported by documentary evidences to the satisfaction of the Project Manager and the Employer.

The increase or decrease in the amount payable by Employer to the Contractor shall be calculated on the basis of the following formula:

$$P_1 = P_o \times \left\{ a + b \left( \frac{S_1}{S_o} \right) + c \left( \frac{A_1}{A_o} \right) \right\}$$

Where

P<sub>o</sub> = Contract Base Price

P<sub>1</sub> = Revised adjusted Contract Price

a = Fixed portion 30%

b = Steel component

- 70% for towers
- 05% for ACSR conductor

- 70% for EHS shield wire
- 55% for OPGW

c = Aluminum component

- 65% for ACSR conductor
- 15% for OPGW

So = Base rate of steel Rebar (US \$ per Metric Ton) prevailing twenty eight (28) days prior to the date of Bid Opening based on London Metal Exchange (LME) cash (official) rate applicable for all grades of steel or Pakistan Steel Mills (PSM) Billet rate (whichever is applicable).

S1 = Revised rate of Steel Rebar (US \$ per Metric Ton) prevailing sixty (60) days prior to the date of shipment/delivery by the manufacturer, based on LME cash (official) rate applicable for all grades of Steel or Pakistan Steel Mill (PSM) Billet rate (whichever is applicable).

Ao = Base rate of Aluminum (US \$ per Metric Ton) prevailing twenty eight (28) days prior to the date of Bid Opening based on LME cash (official) rate.

A1 = Revised rate of Aluminum (US \$ per Metric Ton) prevailing sixty (60) days prior to the date of shipment/delivery by the manufacturer.

### **Conditions Applicable to Price Adjustment**

The base date shall be the date 28 days prior to the deadline for submission of the Bid.

The following conditions shall apply:

- If the currency in which the Contract Price is expressed is different from the currency of the country of origin of the materials rates, a correction factor will be applied to avoid incorrect adjustments of the Contract Price. The correction factor shall correspond to the ratio of exchange rates (composite TT&OD) published/ authorized by State Bank of Pakistan between the two currencies on the date for adjustment and base date as defined above and per below formula:

$$\text{Correction Factor} = Z_1 / Z_0,$$

Where,

$Z_1$  = No. of units of Currency of Contract Price which is equivalent to One (01) US Dollar (currency of material indices) on the Date of Adjustment,

$Z_0$  = No. of units of Currency of Contract Price which is equivalent to One (01) US Dollar (currency of material indices) on the Base Date.

- No price adjustment shall be payable on the portion of the Contract price paid to the Contractor as an advance payment.
- Price adjustment shall be applied only if the resulting increase or decrease is more than two percent (2%) of the amount of respective payment invoice calculated at the rates entered in the Price Schedules.

### **Price Adjustment Formula for Price Schedule No. 4 - Installation & other Services [Items C, D, E, F and Installation Services for Additional Work]**

Prices payable to the Contractor, in accordance with the Contract, shall be subject to adjustment during performance of the Contract to reflect changes in the cost of labor and material components, in accordance with the following formula:

The Contract Price shall be adjusted for the local currency prices of the works stated in Schedule 4 -Installation & Services [Items D, E, F, H and Installation Services for Additional Work] of the Price Schedules for any increase or decrease in the costs of the following:

- a) Rate of wages of skilled or unskilled labor.
- b) Petrol and Diesel Fuel
- c) Cement
- d) Reinforcing Steel Bar

No increase in the price of each of the above mentioned components will be allowed beyond the scheduled completion period of Foundation, Installation (Erection & Stringing) works including installation services for additional works if the price increase is because of reasons attributable to the Contractor. The escalation for each component shall be according to the scheduled completion of that item provided however that the extension is granted pursuant to GCC Clause 40. For the avoidance of doubt, the price adjustment regarding work carried out later than the scheduled period, shall continue to be paid at the revised rate of the constituent prevailing on the date of its scheduled completion. The Employer will however, be entitled to any price decrease occurring during such period of delays. For each claim the Contractor shall submit invoice from each source of supply.

The increase or decrease in the amount payable by Employer to the Contractor shall be calculated on the basis of the following formula:

For Foundation Works:

$$A1 = A/100 \left( 30 + 20 \frac{UL1}{UL} + 14 \frac{L1}{L} + 5 \frac{P1}{P} + 11 \frac{D1}{D} + 15 \frac{S1}{S} + 5 \frac{C1}{C} - \right)$$

For Installation Works (Erection & Stringing):

$$A1 = A/100 \left( 30 + 26 \frac{UL1}{UL} + 14 \frac{L1}{L} + 10 \frac{P1}{P} + 20 \frac{D1}{D} \right)$$

Where

A1 = Revised amount for payment.



- A = is the amount payable to the Contractor at the rates entered in Price Schedules, for the work executed after the date of change in the rates or prices of labour or materials mentioned in this section.
- UL = is the basic minimum daily wage rate for unskilled labor (in PKR) as stated in Table 7.11 (Intercity Consumer Prices) for Ludewala City of Monthly Bulletin of Statistics, Statistics Division, Pakistan Bureau of Statistics (PBS), prevailing twenty eight (28) days prior to the date of Bid opening.
- UL1 = is the revised minimum daily wage rate for unskilled labour (in PKR) as stated in Table 7.11 (Intercity Consumer Prices) for Ludewala City of Monthly Bulletin of Statistics, Statistics Division, Pakistan Bureau of Statistics (PBS), prevailing twenty eight (28) days prior to the start of the execution month.
- L = is the basic minimum daily wage rate for skilled labour (mason) (in PKR) as stated in Table 7.11 (Intercity Consumer Prices) for Ludewala City of Monthly Bulletin of Statistics, Statistics Division, Pakistan Bureau of Statistics (PBS), prevailing twenty eight (28) days prior to the date of Bid opening.
- L1 = is the revised minimum daily wage rate for skilled labour (mason) (in PKR) as stated in Table 7.11 (Intercity Consumer Prices) for Ludewala City of Monthly Bulletin of Statistics, Statistics Division, Pakistan Bureau of Statistics (PBS), prevailing twenty eight (28) days prior to start of the execution month.
- P = is the basic rate of Altron Premium (PKR per liter) as notified by Pakistan State Oil (PSO), prevailing twenty eight (28) days prior to the date of Bid opening.
- P1 = is the revised rate of Altron Premium (PKR per liter) as notified by Pakistan State Oil (PSO), prevailing twenty eight (28) days prior to start of the execution month.
- D = is the basic rate of Action + Diesel (PKR per liter) as notified by Pakistan State Oil (PSO), prevailing twenty eight (28) days prior to the date of Bid opening.
- D1 = is the revised rate of Action + Diesel (PKR per liter) as notified by Pakistan State Oil (PSO) Limited, prevailing twenty eight (28) days prior to start of the execution month.
- S = is the basic rate of Iron Bar (M.S. Bar) ½ inch (PKR per TON), as stated in Table 7.11 (Intercity Consumer Prices) for Ludewala City of Monthly Bulletin of Statistics, Statistics Division, Pakistan Bureau of Statistics (PBS), prevailing twenty eight (28) days prior to the date of Bid opening.
- S1 = is the revised rate of Iron Bar (M.S Bar) ½ inch (PKR per TON), as stated in Table 7.11 (Intercity Consumer Prices) for Ludewala City of Monthly Bulletin of Statistics, Statistics Division, Pakistan Bureau of Statistics (PBS), prevailing twenty eight (28) days prior to start of the execution month.
- C = is the basic rate of Cement (Local) (PKR per bag), as stated in Table 7.11 (Intercity Consumer Prices) for Ludewala City of Monthly Bulletin of Statistics, Statistics Division, Pakistan Bureau of Statistics (PBS), prevailing twenty eight (28) days prior to the date of Bid opening.

C1 = is the revised rate of Cement (Local) (PKR per bag), as stated in Table 7.11 (Intercity Consumer Prices) for Ludewala City of Monthly Bulletin of Statistics, Statistics Division, Pakistan Bureau of Statistics (PBS), prevailing twenty eight (28) days prior to start of the execution month.

30 = is the fixed percentage coefficient

In determining the amount of any increase or decrease to the Contract Price pursuant to this section, no account shall be taken of any fluctuation as a result of Government orders or otherwise in the cost of benefits i.e. bonus, gratuity, education, group insurance, paid holidays, casual leaves, workmen compensation etc. Any increase or decrease in the price of materials which have not been used on the project during that month shall not be considered in the adjustment of the Contract Price, and the ratio will be taken as one (1). If at any time the current indices are not available, provisional indices as determined by the Project Manager will be used subject to subsequent correction of the amounts paid to the Contractor when the current indices become available.

The value of any revised rates or prices shall be supported by documentary evidences to the satisfaction of the Project Manager and the Employer.

No price adjustment shall be payable on the portion of the Contract Price paid to the Contractor as an Advance Payment.

Price Escalation / Adjustment shall be applied only if the resulting increase or decrease is more than two percent (2%) of the amount of respective payment invoice calculated at the rates entered in the schedule of prices.

## **STANDARD FORMS**

Standard Forms include the following:

- Form of Contract Agreement
- Form of Performance Security  
(Bank Guarantee)
- Form of Bank Guarantee/Bond for Advance Payment
- Indemnity Bond For Secured Advance

(Note: Standard Forms provided in this document for securities are to be issued by a bank. In case the bidder chooses to issue a bond for accompanying his bid or performance of contract or receipt of advance, the relevant format shall be tailored accordingly without changing the spirit of the Forms of securities).

**FORM OF CONTRACT AGREEMENT**

THIS CONTRACT AGREEMENT (hereinafter called the "Agreement") made on the \_\_\_\_\_ day of \_\_\_\_\_ (month) 20\_\_\_\_ between \_\_\_\_\_ (hereafter called the "Employer") of the one part and \_\_\_\_\_ (hereafter called the "Contractor") of the other part.

WHEREAS the Employer is desirous that certain Works, viz \_\_\_\_\_ should be executed by the Contractor and has accepted a Bid by the Contractor for the execution and completion of such Works and the remedying of any defects therein.

NOW this Agreement witnessed as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents after incorporating addenda, if any except those parts relating to Instructions to Bidders shall be deemed to form and be read and construed as part of this Agreement, viz:
  - (a) The Contract Agreement
  - (b) Notification of Award (NOA)
  - (c) The Letter of Acceptance
  - (d) The completed Form of Bid
  - (e) The Priced Schedule of Prices with Preamble
  - (f) The Preamble to Conditions of Contract
  - (g) The Particular Conditions of Contract
  - (h) The General Conditions of Contract
  - (i) The completed Schedules to Bid
  - (j) The Specifications
  - (k) The Drawings
3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy defects therein in conformity and in all respects with the provisions of the Contract.
4. The Employer hereby covenants to pay the Contractor, in consideration of the execution and completion of the Works as per provisions of the Contract, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS WHEREOF the parties hereto have caused this Contract Agreement to be executed on the day, month and year first before written in accordance with their respective laws.

Signature of the Contactor

\_\_\_\_\_  
(Seal)

Signature of the Employer

\_\_\_\_\_  
(Seal)

Signed, Sealed and Delivered in the presence of:

Witness:

\_\_\_\_\_

(Name, Title and Address)

Witness:

\_\_\_\_\_

(Name, Title and Address)

**FORM OF PERFORMANCE SECURITY  
(Bank Guarantee)**

Guarantee No. \_\_\_\_\_

Executed on \_\_\_\_\_

Expiry date \_\_\_\_\_

[Letter by the Guarantor to the Employer]

Name of Guarantor (Bank) with  
address: \_\_\_\_\_Name of Principal (Contractor) with  
address: \_\_\_\_\_\_\_\_\_\_  
Penal Sum of Security (express in words and  
figures) \_\_\_\_\_\_\_\_\_\_  
Letter of Acceptance No. \_\_\_\_\_ Dated \_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bidding Documents and above said Letter of Acceptance (hereinafter called the Documents) and at the request of the said Principal we, the Guarantor above named, are held and firmly bound unto the \_\_\_\_\_ (hereinafter called the Employer) in the penal sum of the amount stated above for the payment of which sum well and truly to be made to the said Employer, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has accepted the Employer's above said Letter of Acceptance for \_\_\_\_\_ (Name of Contract) for the \_\_\_\_\_ (Name of Project).

NOW THEREFORE, if the Principal (Contractor) shall well and truly perform and fulfill all the undertakings, covenants, terms and conditions of the said Documents during the original terms of the said Documents and any extensions thereof that may be granted by the Employer, with or without notice to the Guarantor, which notice is, hereby, waived and shall also well and truly perform and fulfill all the undertakings, covenants terms and conditions of the Contract and of any and all modifications of said Documents that may hereafter be made, notice of which modifications to the Guarantor being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue till all requirements of Clause 30, Defects after Taking Over, of Conditions of Contract are fulfilled.

Our total liability under this Guarantee is limited to the sum stated above and it is a condition of any liability attaching to us under this Guarantee that the claim for payment in writing shall be received by us within the validity period of this

Guarantee, failing which we shall be discharged of our liability, if any, under this Guarantee.

We, \_\_\_\_\_ (the Guarantor), waiving all objections and defences under the Contract, do hereby irrevocably and independently guarantee to pay to the Employer without delay upon the Employer's first written demand without cavil or arguments and without requiring the Employer to prove or to show grounds or reasons for such demand any sum or sums up to the amount stated above, against the Employer's written declaration that the Principal has refused or failed to perform the obligations under the Contract which payment will be effected by the Guarantor to Employer's designated Bank & Account Number.

PROVIDED ALSO THAT the Employer shall be the sole and final judge for deciding whether the Principal (Contractor) has duly performed his obligations under the Contract or has defaulted in fulfilling said obligations and the Guarantor shall pay without objection any sum or sums up to the amount stated above upon first written demand from the Employer forthwith and without any reference to the Principal or any other person.

IN WITNESS WHEREOF, the above-bounden Guarantor has executed this Instrument under its seal on the date indicated above, the name and corporate seal of the Guarantor being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

|                            |                            |
|----------------------------|----------------------------|
|                            | _____<br>Guarantor (Bank)  |
| Witness:                   |                            |
| 1. _____                   | Signature _____            |
| _____                      | Name _____                 |
| Corporate Secretary (Seal) | Title _____                |
| 2. _____                   |                            |
| _____                      | _____                      |
| Name, Title & Address      | Corporate Guarantor (Seal) |

**FORM OF BANK GUARANTEE FOR ADVANCE PAYMENT**

Guarantee No. \_\_\_\_\_  
Executed on \_\_\_\_\_  
Expiry date \_\_\_\_\_

WHEREAS the \_\_\_\_\_ (hereinafter called the Employer) has entered into a Contract for \_\_\_\_\_

\_\_\_\_\_ (Particulars of Contract), with

\_\_\_\_\_ (hereinafter called the Contractor).

AND WHEREAS the Employer has agreed to advance to the Contractor, at the Contractor's request, an amount of \_\_\_\_\_ (Rs. \_\_\_\_\_) which amount shall be advanced to the Contractor as per provisions of the Contract.

AND WHEREAS the Employer has asked the Contractor to furnish Guarantee to secure advance payment for performance of his obligations under the said Contract.

AND WHEREAS \_\_\_\_\_ (Bank) (hereinafter called the Guarantor) at the request of the Contractor and in consideration of the Employer agreeing to make the above advance to the Contractor, has agreed to furnish the said Guarantee.

NOW THEREFORE the Guarantor hereby guarantees that the Contractor shall use the advance for the purpose of above mentioned Contract and if he fails, and commits default in fulfillment of any of his obligations for which the advance payment is made, the Guarantor shall be liable to the Employer for payment not exceeding the aforementioned amount.

Notice in writing of any default, of which the Employer shall be the sole and final judge, as aforesaid, on the part of the Contractor, shall be given by the Employer to the Guarantor, and on such first written demand payment shall be made by the Guarantor of all sums then due under this Guarantee without any reference to the Contractor and without any objection.

This guarantee shall come into force as soon as the advance payment has been credited to the account of the Contractor.

This guarantee shall expire not later than \_\_\_\_\_ by which date we must have received any claims by registered letter, telegram, telex or telefax.



It is understood that you will return this Guarantee to us on expiry or after settlement of the total amount to be claimed hereunder.

Witness:

1. \_\_\_\_\_

\_\_\_\_\_  
Corporate Secretary (Seal)

2. \_\_\_\_\_

\_\_\_\_\_  
Name, Title & Address

\_\_\_\_\_  
Guarantor (Bank)

Signature \_\_\_\_\_

Name \_\_\_\_\_

Title \_\_\_\_\_

\_\_\_\_\_  
Corporate Guarantor (Seal)

## INDEMNITY BOND FOR SECURED ADVANCE AGAINST MATERIALS BROUGHT AT SITE

(ON RS.40 NONJUDICIAL STAMP PAPER)

This Deed of Indemnity is issued by M/s. \_\_\_\_\_  
 \_\_\_\_\_ (Name of the Contractor) in favour  
 of M/s. \_\_\_\_\_ (Name of the Employer).

**Whereas** \_\_\_\_\_ (hereinafter called the Employer) has agreed to pay the Secured Advance against the cost of material through any Bank or like agency by any other method by virtue of the terms of the contract existing between the parties. The details of the material and their price for which secured advance is being sought for the period \_\_\_\_\_ till consumption of the material is as under :-

- |          |              |           |             |
|----------|--------------|-----------|-------------|
| 1. _____ | at Rs. _____ | per _____ | = Rs. _____ |
| 2. _____ | at Rs. _____ | per _____ | = Rs. _____ |
| 3. _____ | at Rs. _____ | per _____ | = Rs. _____ |
| 4. _____ | at Rs. _____ | per _____ | = Rs. _____ |

### THEREFORE THIS DEED OF INDEMNITY WITNESSETH AS FOLLOWS:

I/We \_\_\_\_\_ of M/s. \_\_\_\_\_ do hereby indemnify M/s \_\_\_\_\_ for all losses due to thefts, arson, pilferage, loss due to flood and inundation, shortage, deterioration and depreciation etc. through any act of Man or God or slump in the Market of any or all the materials financed or paid by the Employer on our request for financing payment against material.

I/We \_\_\_\_\_ shall indemnify \_\_\_\_\_ against any or all claims, action damages arising out of or resulting to the said material.

I/We \_\_\_\_\_ further declare that we will faithfully abide by the above declaration and solemnly affirm that we will not remove, sell, pilferage any of the materials against which M/s \_\_\_\_\_ has paid us such a secured advance and will not pledge the same with any Bank, Finance Corporation, Firm, Company, Individual or the like agency or create any change whereon in any from what so ever.

I/We \_\_\_\_\_ do hereby also declare that in the event of my/our infringement of the declaration made above \_\_\_\_\_ will be entitled to forfeit all such material and also proceed against me/us according to the relevant clause pertaining to breach of contract and further invoke the power or seek any remedies secured of \_\_\_\_\_ under the contract Agreement signed with us or otherwise available under law.

Place \_\_\_\_\_ Dated \_\_\_\_\_

Contractor \_\_\_\_\_

## SECTION 8

### SPECIAL PROVISIONS

#### 1. SCOPE OF WORK

The scope of work includes design, manufacture, insurance to Site(s), delivery to wharf at port of Karachi, unloading and loading at Karachi, transportation to the transmission line site, unloading and storage at site, installation, testing and commissioning of Plant and design and construction of associated civil works for 500 kV Transmission Lines for Phase-1 of C5 Power Evacuation Scheme as listed in the Price Schedules.

All materials, tools, equipment and services, necessary for the reliable and safe operation of the transmission line shall be included in the Bids.

The scope of work includes the Procurement of Plant - Design, Manufacture, Supply, Installation, Testing and Commissioning of 500 kV Transmission Lines for Phase-1 of C5 Power Evacuation Scheme, as per Volume – II, Technical Provisions of these Bidding Documents.

The Lines shall be of ACSR “Drake” conductor per phase for 500 kV having one overhead aluminum clad steel shield wire and one OPGW in Single circuit lines, whereas OPGW on both peaks for Double circuit transmission lines.

Tentative routes, alongwith Plan & Profile for the above-mentioned double circuit transmission lines have been worked out and included in Volume-III of the tender documents for bidding purpose. The routes for Single Circuit lines (as in Lot-VII, VIII, IX & X) are expected to fall in the vicinity of and parallel to the corresponding Double Circuit lines. The finalized routes shall be provided to the successful bidder(s) after the award of contract(s). The project will be executed on EPC basis i.e., the contractor will be responsible for Design, Manufacturing, Supply and Installation of all equipment.

The scope in lots as per attached KMZ route/ structure lists is divided as below:

| Lot  | Starting Location/<br>Tower No.                                                                                                                                                                        | Ending Location/<br>Tower No. | Reference<br>Structure List |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------|
| I    | Gantry at Ludewala<br>End                                                                                                                                                                              | 145                           | ‘X’                         |
| II   | 145 (excluding tower)                                                                                                                                                                                  | Gantry at Fsd. West End       | ‘X’                         |
| III  | Gantry at C5 End                                                                                                                                                                                       | 80                            | ‘Y’                         |
| IV   | 80 (excluding tower)                                                                                                                                                                                   | 171                           | ‘Y’                         |
| V    | 1 (excluding tower)                                                                                                                                                                                    | 84                            | ‘Z’                         |
| VI   | 84 (excluding tower)                                                                                                                                                                                   | Gantry at Ludewala<br>End     | ‘Z’                         |
| VII  | The routes for Lots VII, VIII, IX, and X are expected to run in the vicinity of and generally parallel to the corresponding routes of the Double Circuit transmission lines under Lots III, IV, V, and |                               |                             |
| VIII |                                                                                                                                                                                                        |                               |                             |
| IX   |                                                                                                                                                                                                        |                               |                             |

|   |                                                                                                                          |
|---|--------------------------------------------------------------------------------------------------------------------------|
| X | VI, respectively. The finalized routes shall be provided to the successful bidder(s) after the award of the Contract(s). |
|---|--------------------------------------------------------------------------------------------------------------------------|

**Notes:**

1. The tower/location numbers given above are as per the attached Structure Lists and should be read for reference only.
2. The supply and erection of the end tower for each lot shall be the responsibility of the Contractor assigned to that lot. However, stringing on either side of the end tower shall be carried out by the respective Contractor of each adjoining lot.

**2. GENERAL**

- 2.1 All design, equipment, material & workmanship shall comply with & tested in accordance with requirements of this specification and the Technical Specifications in Volume-II of Bidding Documents. Equipment or parts which are not covered by these Specifications, shall comply with rules, codes & regulations of International Electro technical Commission or approved National Standardizing bodies.
- 2.2 The general intent of these specifications is to require the supply of equipment and materials equal or superior to those actually described herein. Unless otherwise stated, reference to the brand or manufacture, if made is only for the sake of comparison as to type, design, character or quality of the equipment and materials desired and shall not be interpreted as eliminating other equipment and materials of equal performance quality and durability.
- 2.3 All questions arising as to the acceptability or otherwise of the equipment and materials offered shall be decided by the Engineer whose decision shall be final.
- 2.4 The contract shall be executed in strict conformity with the specifications and/or drawings given or mentioned in this section and the supplier shall do no `Work` without proper specifications, instructions and/or drawings.
- 2.5 All the goods, the quantities of which are defined in Schedule of Prices for main equipment, shall be of the material in accordance with the Technical Specifications in Volume-II of Bidding Documents.
- 2.6 Wherever reference is made in the Technical Specifications to specific standards and codes to be met by the goods and materials to be furnished or tested, the provisions of the latest current edition or revision of the relevant standards or codes in effect shall apply, unless otherwise expressly stated in the Contract. Where such standards and codes are national or relates to a particular country or region, other authoritative standards that ensure substantial equivalence to the standards and codes specified will be acceptable.
- 2.7 Goods and material specified in the Technical Specification must comply with

standards cited or other recognized standards, which ensure an equal or higher quality than the standards mentioned.

### **3. UNITS OF MEASUREMENT**

- 3.1 All dimensions and units given by the Bidder in the Bid with its associated drawings and the Approval Drawings as submitted by the Contractor shall be in metric system and all reference to weights, measurements and quantities shall be metric units.

### **4. DRAWINGS**

The Bidders/Supplier are required to submit drawings of its offered equipment during different stages of the tender/contract. Following are various categories of the drawings referred in this document:

#### **i) Specification Drawings**

The specification drawings are given in Volume-III of the bidding Documents indicating general/tentative requirements of the goods/equipment for the bidders to prepare their bids.

#### **ii) Bid Drawings**

The bid drawings are the drawings prepared by the Bidder for bidding purposes, and shall be part of his Bid.

#### **iii) Drawings for Approval**

These drawings are the drawings submitted by the Supplier/Contractor for the purpose of acquiring approval of the Engineer to have “Approved drawings” for equipment manufacturing.

#### **iv) Approved Drawings**

These are the drawings approved by the Engineer and the manufacturing of goods/equipment shall be carried out in accordance with the Approved drawings & data. The specification drawings and Supplier’s bid drawings shall not be used for manufacturing of Goods unless specific instructions for such use are given by the Engineer.

#### **v) As-Built Drawings**

The Supplier/Contractor shall submit as-built drawings/data to the Engineer as detailed in clause 4.1.2 below, which shall incorporate all changes made in the equipment during contract execution.

#### **4.1 DRAWINGS & OTHER DATA TO BE FURNISHED BY THE SUPPLIER**

##### **4.1.1 Drawings/data for Approval & Approved Drawings**

###### **A. General:**

The Supplier shall submit detailed drawings/Specific Plant Data for approval by the Engineer in accordance with provisions of Contract and the additional requirements specified in the respective Clauses hereof. The drawings/data shall be complete in all respects, shall have been reviewed and checked by the Supplier and shall be submitted in due time and in logical order to facilitate proper coordination.

If any errors, omissions or discrepancies are found in the figures, specifications and/or drawings or, if any feature shall appear to the supplier to be indefinite or unclear, the same shall be referred to the Engineer whose written explanation and/or clarification shall be obtained before proceeding with the work.

The Supplier shall allow one (01) month for the Engineer's approval of drawings in his schedule of work and in the time allowed for completion of the contract. Extra time required for approval of drawings due to deficiencies in design or errors in submitted drawings shall be the responsibility of the supplier and no extension in time will be allowed on this account.

The sequence of submission of all drawings shall be such that all information is available for checking each drawing when it is received.

All drawings and documents furnished by the Supplier in accordance with the Contract shall become the property of the Purchaser.

All approved drawings/data shall form part of the Contract. If revisions are required after a drawing/data has been approved, the Supplier shall furnish for approval additional copies specified for the initial submission, prior to such revision(s).

Approval by the Engineer does not relieve the Supplier of his responsibility to do the work in accordance with the Contract.

The Supplier shall be responsible for any discrepancies, errors or omissions in any drawings or other particulars supplied by him whether such drawings or particulars have been approved by the Engineer or not.

###### **B. Format for submission of drawings/data for approval:**

All drawings shall be in English language and all dimensions shall be in Metric System. Symbols shall be in accordance with IEC standards. All drawings shall be clearly marked "National Grid Company of Pakistan Limited (NGC) - (specify item name) \_\_\_\_\_ for construction of 500 kV Transmission Lines for Phase-1 of C5 Power Evacuation Scheme". All drawings/data submitted for approval shall conform to ISO paper sizes A0 or A4.

All drawings submitted for approval shall be provided with a blank white space, approximately 90 mm in height by 120 mm in width, near the lower right-hand corner to be used for notations by the Engineer.

Drawings for approval, shall be distributed through international couriers to addresses and in number as specified in Sub-Clause 4.1.3 hereof.

**C. Drawings & Specific Plant Data to be submitted for Engineer's Approval:**

The Supplier shall submit the following drawings and Specific Plant Data in hard copy as well as soft copy (in pdf & AutoCAD formats) within fifteen (15) days after issuance of Notification of Award for approval of the Engineer, together with overall and handling weights and dimensions of the Goods to be provided under the Contract.

Manufacturer's design engineer shall visit the Engineer during review & approval of specific plant data/technical data & drawings and it shall be arranged by the Supplier.

**(1) Steel Towers**

- (i) Tower single line diagram indicating dimensions (height, width) of overall tower & its parts (basic body, leg & body extensions, cross-arms, tower peaks etc.) and also indicating outline of tower insulator strings & their position on tower and arrangement of circuits on tower.
- (ii) Tower outline drawings showing sizes of members and the detail drawings for the assembly and fabrication of different parts of towers i.e. basic tower body, body extension & leg extensions including gusset plates, bolts and associated hardware etc.
- (iii) Tower 3D Drawings with all tower components including those that mate with hardware/accessories.
- (iv) List of angle sizes used for each tower type & properties of angle sizes.
- (v) Bill of required tower material shall indicate quantity and

information related to size of angles and tower hardware, material type, unit and total weight of black section and weight after galvanization.

- (vi) Specific Plant Data sheets.
- (vii) Complete set of all type test/prototype test reports (even if carried out in earlier contract)
- (viii) Test Programme indicating arrangement & details of all tests to be carried out and their tentative schedule.
- (ix) Packing details.
- (x) Any other information and drawing which may be required by the Engineer or the Supplier understand that it will be deemed necessary for smooth execution of project.

**(2) Conductor, Shield Wire and OPGW along with associated equipment**

Detail drawings of reels and Specific Plant Data, test program indicating arrangement & details of all tests to be carried out and their tentative schedule, complete set of all type test reports (even if carried out in earlier contract), packing details/drawings and other drawings/data required to be submitted in accordance with the Specifications and any other information which may be required by the Engineer or information which the Supplier understands that it will be deemed necessary for smooth execution of project.

**(3) Accessories**

Dimensional drawings of accessories, Specific Plant Data sheets, packing details/drawings, test programme indicating details of all tests to be carried out, their tentative schedule, type test reports and any other information which may be required by the Engineer or the information which Supplier understand that it will be deemed necessary for smooth execution of project.

**(4) Insulators Hardware Strings**

Dimensioned drawings of insulator hardware strings, detail drawings of insulators hardware assemblies & components drawings, 3D drawings of hardware assemblies & components, Specific Plant Data sheets, packing details/drawings, test programme indicating details of all tests to be carried out, their tentative schedule, complete set of all



type test reports of insulator hardware strings (even if carried out in earlier contract) and any other information which may be required by the Engineer or information which the Supplier deems necessary for smooth execution of project.

The submitted drawing of insulator hardware assemblies must indicate below information:

- a. Drawing number and revision
- b. Date of issue
- c. Scale
- d. Type and/or Catalogue number
- e. Principal dimensions with manufacturing Tolerances
- f. Skirt spacing with tolerances
- g. Surface area of top and bottom porcelain body (separately)
- h. Electrical and Mechanical (E&M) strength and Electromechanical Failing Load
- i. Tension proof load
- j. Impact Strength
- k. Electrical Data
  - Dry Power Frequency withstand voltage (kV)
  - Wet Power Frequency withstand voltage (kV)
  - Dry Lightning Impulse withstand voltage (kV)
  - Minimum Power Frequency Puncture Voltage (kV)
  - Critical impulse flashover-Positive
  - Critical impulse flashover-Negative
  - Power Frequency electric arc voltage (s/kA)
  - Radio influence voltage 1 MHz ( $\mu\text{V}$ )
- l. Minimum Creepage Distance with positive tolerance
- m. Minimum dry arcing distance with positive tolerance
- n. Height of porcelain shell (measured from base of porcelain cap to bottom of outermost rib)
- o. Metal hardware component standard and grade
- p. Net Weight of insulator unit
- q. Zinc Coating Thickness on ferrous (cap & pin/Tongue & clevis) parts
- r. Cap & pin/Tongue & Clevis Material
- s. List of material
- t. Connecting length with tolerance
- u. Material of disc (porcelain/glass)
- v. Colour of porcelain body & RTV Coating, if applied
- w. All Markings

**(5) Spacer Dampers and Stockbridge Vibration Dampers**

Dimensioned drawings of the dampers, 3D drawing of dampers, Specific Plant Data sheets, packing details/drawings, installation instructions, spacing data, test programme indicating details of all tests to be carried out, their tentative schedule, complete set of all type test reports (even if carried out in earlier contract) and any other information which may be required by the Engineer or the information which information which Supplier understand that it will be deemed

necessary for smooth execution of project.

**D. Process of Approval of Drawings/Data**

- (1) All changes/corrections will be made on the relevant submitted drawings/data and will be marked "APPROVED", "APPROVED EXCEPT AS NOTED" or "RETURNED FOR CORRECTION" by the Engineer. One print will be returned to the Supplier. The other shall be retained by the Engineer for his own use and for the use of Purchaser and shall serve as the Master Copy and shall prevail in case of any doubt or discrepancy subsequently arising.
- (2) If the drawing/data is returned to the Supplier stamped "APPROVED" he may immediately proceed with manufacturing of Goods. Any drawing/data marked "APPROVED" by the Engineer shall be known as an "Approved Drawing".
- (3) If the drawing/data is returned to the Supplier stamped "APPROVED EXCEPT AS NOTED" he may proceed with the manufacturing of Goods taking into account the corrections and comments noted on the drawing/data. The Supplier shall revise the drawings/data as required and resubmit them in the same routine as before for record purposes.
- (4) If the drawing/data is returned to the Supplier stamped "RETURNED FOR CORRECTION" he shall not proceed with the manufacturing of Goods but shall make the changes and corrections or prepare new drawings/data and resubmit the revised drawing/data to the Engineer for approval at no change in price or Delivery & Completion Schedule. Resubmitted prints and calculations will be subject to the same routine as stated before. Time required for such revisions and re-submittals of drawings/data or calculations will not entitle the Supplier to any extension in Contractual Completion time.
- (5) If the Supplier does not agree with exceptions taken by the Engineer, the Supplier shall state in his letter of re-submittal his reasons for not complying with the Engineer's exceptions. Revision number and date and description of change shall be shown on all drawings or calculations revised.

**E. Manufacturing Prior to Engineer's approval of Drawings/data**

Any manufacturing/fabrication of Goods done prior to the approval of drawings & data shall be at the Supplier's risk. The Engineer shall have the right to reject the said Goods if not conforming to required specifications and drawings or to request additional details and to require the Supplier to make any change(s) which are necessary to conform to the provisions and intent of

these Specifications and such changes shall be made without additional cost to Purchaser. The approval of the drawings & data by the Engineer shall not be construed as a complete check but will indicate only that the detailing is satisfactory. Approval by the Engineer of the Supplier's drawings & data shall not be held to relieve the Supplier of his obligations to meet all the requirements of these Specifications or the responsibility for the correctness of the Supplier's drawings & data or for correct fit and use of assembled Goods furnished by the Supplier.

#### **4.1.2 As-Built Data, Drawings & Documents**

The Supplier shall submit as built drawings, specific works data and documents on DVD/Pen Drive, as detailed below, within five (05) days after issuance of Inspection Certificate (IC) to Director General (Transmission Engineering), NGC.

##### **(1) Steel Towers**

- (i) As built single line diagram of towers and tower outline drawings & accessories showing sizes of members & detail drawings for assembly (in PDF format & AutoCAD format)
- (ii) As built detailed tower fabrication drawings (in PDF format & AutoCAD format)
- (iii) 3D drawings of all tower parts & components that mate with hardware/accessories, clearly indicating all relevant dimensions (in PDF format & AutoCAD format).
- (iv) As built detailed Bill of quantities (BOQ) for each tower and its accessories. This should include quantity and information related to size of angles and tower hardware, material type, unit and total weight of bare section and weight after galvanization.
- (v) As Built list of angle sizes used for each type of tower and properties of angle sizes.
- (vi) Specific Plant Data sheets.
- (vii) Detail drawing/data of tower platform and its installation details.
- (viii) Complete set of factory acceptance test reports.
- (ix) Complete set of all type test/prototype test reports (even if carried out in earlier contract)
- (x) Packing Lists
- (xi) Any other information and drawing which may be required by the Engineer.

##### **(2) Conductor, Shield Wire and OPGW along with associated equipment**

- (i) As built detailed drawings of Reels (in PDF format & AutoCAD)

- (ii) 3D drawings of all parts of reels that mate with tensioner/puller equipment (in PDF format & AutoCAD format).
- (iii) Specific Plant Data sheets.
- (iv) Complete set of factory acceptance test reports.
- (v) Complete set of all type test reports (even if carried out in earlier contracts)
- (vi) Packing Lists
- (vii) Any other information and drawing which may be required by the Engineer.

(3) **Accessories**

Dimensional drawings of accessories, Specific Plant Data sheets, packing details/drawings etc.

(4) **Insulator Hardware Assemblies**

- (i) Detailed outline drawings of hardware assemblies and detailed hardware component drawings (in PDF format & AutoCAD format)
- (ii) Detailed drawings of insulators (in PDF format & AutoCAD format)
- (iii) 3D drawings of hardware assemblies and components (in PDF format & AutoCAD format).
- (iv) Detailed Bill of quantities (BOQ)
- (v) Specific Plant Data sheets.
- (vi) Complete set of factory acceptance test reports.
- (vii) Complete set of all type test reports (even if carried out in earlier contract)
- (viii) Packing Lists
- (ix) Any other information & drawing which may be required by the Engineer.

(5) **Spacer Dampers and Stockbridge Vibration Dampers**

- (i) Detailed drawings of dampers (in PDF format & AutoCAD format)
- (ii) Vibration studies and damper placement charts
- (iii) 3D drawings of dampers (in PDF format & AutoCAD format).
- (iv) Detailed Bill of quantities (BOQ)
- (v) Specific Plant Data sheets.
- (vi) Complete set of factory acceptance test reports.
- (vii) Complete set of all type test reports (even if carried out in earlier contract)
- (viii) Packing Lists

- (ix) Any other information and drawing which may be required by the Engineer

#### 4.1.3 Distribution of Drawings and Documents

The drawings and documents shall be submitted to the Engineer within the time given in the Contract or within such reasonable time as the Engineer may require, and in the number as specified hereunder:

| Documents                                                                    | Engineer       |                | Purchase<br>r/<br>Project<br>Director | Total |
|------------------------------------------------------------------------------|----------------|----------------|---------------------------------------|-------|
|                                                                              | Head<br>Office | Site<br>Office |                                       |       |
| Drawings for approval                                                        | 3              | -              | 1                                     | 4     |
| Approved Drawings                                                            | 2              | 2              | 1                                     | 5     |
| Schedules, specifications<br>and other documents/data                        | 2              | 1              | 1                                     | 4     |
| Record (As-Built) Drawings<br>and Data                                       | 2              | -              | 4                                     | 6     |
| Reproducible transparency<br>Record (As-Built) Drawings                      | 1              | -              | 1                                     | 2     |
| Record (As-Built) Drawings<br>on pen drive/DVD/CD in pdf<br>& AutoCAD format | 1              | -              | 1                                     | 2     |
| Codes and standards                                                          | 1              | -              | 1                                     | 2     |
| Manufacturing progress<br>information                                        | 2              | 1              | 2                                     | 5     |
| Insurance Certificates                                                       | 1              | 1              | 2                                     | 4     |
| Receiving reports                                                            | 1              | 1              | 2                                     | 4     |
| Damage reports                                                               | 1              | 1              | 2                                     | 4     |
| Correspondence with Purchaser                                                | 1              | 1              | 1                                     | 3     |
| Correspondence with Head office<br>of Engineer                               | 1              | 1              | 1                                     | 3     |

## **5. STANDARDS AND TYPICAL DESIGN**

### **5.1 General**

The Specifications cite or imply International Standards and typical design for Goods. Other equivalent standards and typical designs are equally acceptable provided that they in no way detract from the quality, safety, operationability of the Goods furnished. However, when standards or typical design other than those cited or implied are offered by a bidder, he shall set forth in his Contract the alternative standards proposed so that a direct comparison can be made before Contract Award. Each specific difference from the Specifications shall be clearly indicated by the bidder. If no alternatives are set forth by the bidder, it will be assumed that offered Goods will be in accordance with the International Standards and typical design as cited or implied in the Specifications.

Where the documents provide requirements for manufacturing by specifying a standard such as, for example, one of the international standard organizations which have its origin in one country, it is not the intention to restrict the requirements solely to that standard and that country. Other standards, including standards of other countries will be accepted provided the requirements thereof in the sole opinion of the Engineer are at least equal to the requirements of the standards specified. The bidder may propose an equivalent standard other than that specified, in which case he shall submit the proposed standard and all other information required by the Engineer and shall submit written demonstration that his proposed standard is equivalent or superior to the one specified herein. The submission must be made in English language. Moreover, the bidder shall also supply copy of the latest revision of the standards used in his bid.

### **5.2 Applicable Standards and Codes**

- (1) All Goods and design shall be generally in accordance with latest revision of the standards specified in the Technical Provisions except where specifically directed otherwise. If these Specifications conflict with any or all the standards stated in the Technical Provisions, these Specifications shall have precedence and shall govern.
- (2) In case deviation from the above standards is minor, approval of the Engineer may be given to use other national standards prevalent in the country of manufacture. No departure from the standards specified will be considered after the Contract has been awarded unless specific authorization is requested in writing from the Engineer.

## **6. PORT OF ENTRY AND DISEMBARKATION**

The Supplier would have the option to use either Karachi Port or Port Muhammad Bin Qasim or both or any other seaport in Pakistan as the port(s) of entry and disembarkation, at his own risk and costs. For the purpose of clarification, the term "Wharf at the Port of Karachi" wherever used throughout this document shall mean:

- (a) Wharf at the Port of Karachi, and/or
- (b) Wharf at the Port of Muhammad Bin Qasim

## **7. PACKING AND MARKING**

As discussed in Section-IV Clause 23.2: Part-II: Particular Conditions of Contract.

## **8. TRANSPORTATION OF GOODS**

### **8.1 General**

The Supplier outside from the Purchaser's country shall transport the Goods from its place of manufacture or origin to the Purchaser's port and insurance thereof from its place of manufacturer up to **NGC Store Jamshoro** and shall be solely responsible for selection of routes and carriers, and expediting in order that all shipments are safely and expeditiously transported and arrived at Karachi Sea Port.

### **8.2 Shipping**

The shipment of all the consignments relating to Goods shall be arranged by the Supplier through vessels owned or chartered by the Pakistan National Shipping Corporation (PNSC). In case PNSC is not available to transport the Goods within the time period(s) specified in the Contract, the Supplier after obtaining Non-Availability Certificate (NAC) from PNSC may arrange for such transportation on other ocean carriers except those carrying Israeli Flag. For working out a proper schedule to match the completion of delivery, the Supplier will keep a continuous liaison with the Agent of the respective shipping line within the country of origin.

## **9 SHOP INSPECTION AND ORDERS FOR GOODS**

### **9.1 Inspection**

Unless otherwise authorized by the Engineer no Goods shall be shipped from its point of original manufacture or final shop assembly before it has been inspected and approved by the Engineer.

### **9.2 Goods Orders**

The Supplier shall, if requested, provide the Engineer with unpriced copies of the Supplier's purchase orders for Goods or approved sub-Contracted supply at the time any such orders are placed. The Supplier shall also provide the Engineer with any other relevant information requested to ensure proper expediting and scheduling of the deliveries.

### **9.3 Acceptance of Materials**

The approval by the Engineer of any Goods prior to shipment shall in no way relieve the Supplier of any of his responsibilities for meeting all of the requirements of the Specifications and shall not prevent subsequent rejection if such Goods are later found to be defective or not conforming to the Specifications.

## **10. SCHEDULE AND MEETINGS**

### **10.1 Schedule**

- (1) The Supplier shall manufacture & supply the Goods in accordance with the dates/periods specified in Schedule - C to Bid. The Supplier shall regularly review the Schedule and notify the Engineer promptly of any revisions which in his view may be required from time to time.
- (2) Each group of Goods shall be completely delivered. The Supplier shall keep the Engineer informed of the progress of the Contract and notify the Engineer approximately six (06) weeks in advance, in writing, as to when the Goods will be ready for inspection and for shipping and shall supply lists covering each consignment in sufficient detail to enable the Engineer to check the contents of the packages.
- (3) In preparing the Delivery and Completion Schedule, the Supplier shall fully take into account the requirements (and possibilities) for ocean (or air) freight. Progress of all shipments shall be continuously monitored and the Supplier shall provide staff or agents to expedite all shipments to ensure compliance with the approved Delivery Schedule.

### **10.2 Meetings**

- (1) Soon after the date of Award of Contract, the Engineer will, with the approval of Purchaser require a meeting with Purchaser and the Supplier at WAPDA House, Lahore to discuss scheduling of drawings & data, manufacture, testing & inspection, scheduled sequences of delivery and other similar problems which may be pertinent to the completion of the Project.
- (2) From time to time during the execution of the Contract, the Engineer



may call meetings as deemed necessary for the purpose of progress monitoring and proper execution of the Contract.

- (3) As required by the Engineer, responsible representatives of the Supplier shall attend such meetings.
- (4) All expenses incurred by the Supplier for attending such meetings shall be borne by the Supplier and shall not be reimbursable.

## **11. LANGUAGE**

- 11.1 All correspondence, literature, drawings, name plates, diagrams, applicable data, equipment details, instructions and maintenance books and manuals, spare parts, books and descriptive data shall be in the English language.

## **12. TYPE TESTS**

- 12.1 All equipment being supplied shall conform to type test as per technical specification and shall be subject to routine tests in accordance with requirements stipulated under respective sections. Purchaser reserves the right to witness any or all the type tests as per NGC latest type test policy attached herewith in **Annexure-B**.
- 12.2 The reports for all type tests as per technical specification shall be furnished by the Contractor along with equipment/material drawings. The type tests conducted earlier should have been conducted in any of the STL labs.
- 12.3 The type test reports submitted shall be of the tests conducted within last 15 (fifteen) years prior to the date of bid opening. In case the type test reports are of the test conducted earlier than 15 (fifteen) years prior to the date of bid opening, the contractor shall repeat these test(s) as per NGC latest type test policy attached herewith in **Annexure-B**.
- 12.4 In the event of any discrepancy in the type test reports i.e., any test report not acceptable due to any design/manufacturing changes (including substitution of components) or due to non-compliance with the requirement stipulated in the Technical Specification or any/all additional type tests not carried out, same shall be carried out without additional cost implication to the Purchaser as per NGC latest type test policy attached herewith in **Annexure-B**.
- 12.5 These type test charges would be considered in bid evaluation. In case Bidder does not indicate charges for any of the type tests, it will be presumed that the particular test has been offered free of charge. Further, in case any Bidder indicates that he shall not carry out a particular test; or any test which is required to be carried out as per SP-13.4 above, his offer shall be considered incomplete and liable to be rejected.

- 12.6 The type testing, in case of award, will be arranged as per NGC latest type test policy attached herewith in **Annexure-B** in accordance with the provisions of the bidding document without affecting the stipulated delivery schedule.
- 12.7 Failure to provide type test certificates with the bid may not result in bid rejection. The Purchaser can ask for test results after bid opening as deemed necessary.





## **ANNEXURE – A**

### **SOP FOR BLACKLISTING OF CONTRACTORS**



## **NATIONAL TRANSMISSION & DESPATCH CO. LTD**

**Company Secretary**

No. NTDC/CS/ 191-207

Dated: 27 - 02 - 2019

### **NOTIFICATION**

#### **Approval for revision of SoP for Blacklisting**

Ref: This office notification No.NTDC/CS/1728-42 dated 25.07.2017.

The Board of Directors National Transmission & Despatch Company Limited (NTDC) in its 150<sup>th</sup> meeting held on 25.02.2019 against agenda item No.10 has unanimously resolved and approved the revised/amended SoP for Blacklisting.

  
Ijaz Ahmad  
Company Secretary

#### **Copy to:**

1. Managing Director.
2. Dy. Managing Director (AD&M).
3. Dy. Managing Director (P&E).
4. All General Managers.
5. Chief Financial Officer.
6. Chief Law Officer.
7. Chief Internal Auditor.
8. Chief Information System.

A copy of the revised SoP for Blacklisting is enclosed.



## **NATIONAL TRANSMISSION & DESPATCH CO. LTD**

**Company Secretary**

No. NTDC/CS/ 444-60

Dated: 29 - 03 - 2019

### **CORRIGENDUM**

#### **Approval for revision of SoP for Blacklisting**

In continuation to this office Notification No.NTDC/CS/191-207 dated 27.02.2019 on the subject matter, the designation of Chief Engineer (Reliability Assessment) being a committee member in Chapter No.3 under Clause 3.1 at page # 7 of the approved revised/amended SoP for Blacklisting may be read as 'Chief Engineer (Reliability Compliance)'.

#### **Note:**

- All other contents of the notification will remain intact.

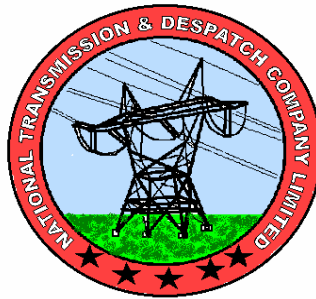
**Ijaz Ahmad**

**Company Secretary**

#### **Copy to:**

1. Managing Director.
2. Dy. Managing Director (AD&M).
3. Dy. Managing Director (P&E).
4. All General Managers.
5. Chief Financial Officer.
6. Chief Law Officer.
7. Chief Internal Auditor.
8. Chief Information System.

# **NATIONAL TRANSMISSION AND DESPATCH COMPANY LIMITED (NTDC)**



## **REVISED SOP FOR BLACKLISTING**

**(As on 25.02.2019)**



# Table of Contents

|                                                                                                                                                                                                              |    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| CHAPTER NO.1.....                                                                                                                                                                                            | 3  |
| 1.1 INTRODUCTION .....                                                                                                                                                                                       | 3  |
| 1.2 EXTENT OF APPLICATION.....                                                                                                                                                                               | 3  |
| CHAPTER NO. 2.....                                                                                                                                                                                           | 5  |
| 2. REASONS OF BLACKLISTING .....                                                                                                                                                                             | 5  |
| CHAPTER NO. 3.....                                                                                                                                                                                           | 7  |
| 3. FORMULATION OF “NTDC’S RIGHTS PROTECTION<br>COMMITTEE” .....                                                                                                                                              | 7  |
| CHAPTER NO. 4.....                                                                                                                                                                                           | 8  |
| 4.1 PROCEDURE FOR BLACKLISTING .....                                                                                                                                                                         | 8  |
| 4.2 INITIATION OF AN ACTION.....                                                                                                                                                                             | 8  |
| 4.3 DECISION.....                                                                                                                                                                                            | 8  |
| 4.4 COMMUNICATION OF DECISION .....                                                                                                                                                                          | 9  |
| 4.5 PERIOD OF DEBARMENT FOR BLACKLISTED FIRMS .....                                                                                                                                                          | 9  |
| Note: All the penalties given herein above will be in addition to the<br>consequences already agreed by the parties in the contract or any other<br>document and other remedies provided under the law. .... |    |
| 4.6 ACTION AFTER FIRMS ARE PLACED ON BLACKLISTING ....                                                                                                                                                       | 9  |
| 4.7 EFFECTIVENESS.....                                                                                                                                                                                       | 10 |
| APPENDIX-1 .....                                                                                                                                                                                             | 11 |
| APPENDIX-2 .....                                                                                                                                                                                             | 13 |
| REFERENCES .....                                                                                                                                                                                             |    |

# CHAPTER NO.1

## 1.1 INTRODUCTION

The main objectives of any procurement process are transparency, economy, fairness and efficiency so that value for money is achieved.

Blacklisting is one of the most effective tools used in the struggle against inefficiencies and corruption in connection with public procurement. In addition, it serves as a major deterrent against any material breach of contract and further ensures the timely execution of projects by holding delinquent persons accountable.

Rule-19 “Blacklisting of suppliers and contractors” of the Public Procurement Rules, 2004 (hereinafter “**PPRA Rules**”) stipulates that;

*“The procuring agencies shall specify a mechanism and manner to permanently or temporarily bar, from participating in their respective procurement proceedings, suppliers and contractors who either consistently fail to provide satisfactory performances or are found to be indulging in corrupt or fraudulent practices. Such barring action shall be duly publicized and communicated to the Authority: Provided that any supplier or contractor who is to be blacklisted shall be accorded adequate opportunity of being heard.”*

In the light of the Clause above, this SOP has been drafted for procurements made by NTDC.

Any capitalised terms and abbreviations used in this SOP which are not defined herein shall have the meanings given to them in Public Procurement Regulatory Authority Ordinance, 2002 (hereinafter “**PPRA Ordinance**”) and PPRA Rules.

## 1.2 EXTENT OF APPLICATION

- i. The procedure shall be applicable and remain in force, along with any amendments thereto, within NTDC until any clear instructions or guidelines are imparted by the Government through PPRA, PEC, or any other competent forum.
- ii. The procedure shall also be applicable on the pre-qualified firms.
- iii. The procedure shall be applicable on any “Person”, which for the purposes of this SOP shall *interalia* include suppliers, bidders, contractors, consultants, firms, individuals, and organizations transacting business with NTDC.
- iv. Wherever any provision of this SOP shall be in conflict with provisions of any applicable guidelines of donor agencies, or any other applicable Statute / Law or Rule enforced at the time in Pakistan, the provisions of such applicable guidelines, laws, or rules shall prevail.

- v. This SOP shall become a part of the future Bidding Documents and the person(s) will submit an Undertaking along-with his bid that he has read and accepts the provisions of this SOP. Non-submission of an Undertaking may result in rejection of his bid. The said Undertaking will subsequently become part of the Contract Agreement as well.

## CHAPTER NO. 2

### 2. REASONS OF BLACKLISTING

2.1 The causes and reasons to be taken into consideration for Debarment / Blacklisting of any person are given as under:

#### 2.1.1 Pre- Award Stage:

The following shall be considered, *interalia*, the causes / reasons for initiating proceedings under this SOP at the Pre-Award Stage:

- i. Indulging in Corrupt, Fraudulent as well as Collusive practices.
- ii. Submission of false and spurious documents, making false statements, making frivolous complaints and allegations to gain undue advantage.
- iii. Commission of embezzlement, criminal breach of trust, theft, cheating, forgery, bribery, falsification or destruction of records, receiving stolen property, false use of trademark, securing fraudulent registration, giving false evidence, furnishing of false information of serious nature.
- iv. Submission of false bid security or infringement of documents to get undue monetary or any other benefit.
- v. Breach of confidentiality of evaluation process as mentioned in Appendix-1 based on illegal access or in any way to get undue benefit or to provide benefit or to frustrate the bidding/evaluation process. This will also include attempts to sabotage the bidding process directly or indirectly.

#### 2.1.2 Post- Award Stage:

The following shall be considered, *interalia*, the causes / reasons for initiating proceedings under this SOP at the Post-Award Stage:-

- i. Extraordinary delay in signing or refusal to accept the Notification of Award and/or the contract without any cogent reason.
- ii. Misconduct, i.e., failure to proceed with the signed contract, withdrawal of commitments, quoting an unreasonably and unfairly low financial offer and subsequently withdrawing such an offer, frustrating the evaluation/bidding process and not responding to written communication in a reasonable time.
- iii. Causes mentioned in Clause 2.1.1 (i, ii & iii) above.
- iv. Submission of fake / frivolous or mutilated Performance Guarantee or Advance Payment Guarantee etc.

- v. Non-satisfactory performance as mentioned in Appendix-2 during the execution of the contract.
- vi. Non-performance or Breach of provisions / clauses of the contract agreements.
- vii. Notwithstanding the warranty/defect liability period, any defect in a product, equipment, plant, facility or services rendered that may subsequently surface during field operations within 5 years of its commissioning.
- viii. Failure to honour obligations within warranty period or defect liability period as defined in the contract.

### **2.1.3 Other Causes**

- i. The person is blacklisted by any Government department in Pakistan, or it is established that the firm is involved in any kind of corruption or corrupt practices anywhere in the world.
- ii. Violations of provisions / instructions set down in the Bidding Documents.
- iii. Any attempt / activity to malign or bring NTDC into disrepute and harm its interest(s).
- iv. Person(s) blacklisted by International Financial Institutions (donor agencies) will be liable to be blacklisted after receipt of confirmation from the donor agencies without any further proceeding.
- v. Any other cause deemed just and appropriate by NTDC in the given circumstances.

### **Note:**

- (1) If above mentioned causes occur either on part of the principal bidder or the local agent, both shall be considered for blacklisting / debarment.
- (2) The authorization of the foreign bidder to local agent shall contain his complete particulars including the name of the company, name of the owner, National Tax number (NTN), CNIC (Computerized National Identity Card) No. etc. In case, the said information is found to be missing, even after calling for the same within a reasonable time, the authority letter shall not be accepted.
- (3) The Bidding Documents shall be issued against original authority letter or in case of scanned copy, the email of the foreign bidder shall be enclosed. However, at the time of bidding, the original authority letter shall be attached with the bid. In the absence of the same, the bid shall be rejected.

## CHAPTER NO. 3

### 3. FORMULATION OF “NTDC’S RIGHTS PROTECTION COMMITTEE”

**3.1** A permanent Committee namely “NTDC’s Rights Protection Committee (**RPC or Committee**)” comprising of the following members shall examine the justification of the reasons given by the Project Authority prior to blacklisting / debarment of any firm/supplier/contractor/ individual.

- |                                                    |          |
|----------------------------------------------------|----------|
| • General Manager (Performance Assessment) NTDC    | Convener |
| • Chief Engineer (Reliability Compliance) NTDC     | Member   |
| • Representative of the Chief Law Officer’s Office | Member   |

Depending upon the nature of the case, the Committee may consult or appoint / nominate additional members from within NTDC with the approval of Managing Director (NTDC), provided that the Committee consists of an odd number of individuals as per spirit of Rule 48(1) of the PPRA Rules. Independence of any additional members shall be ensured while making the selection of such additional members. Furthermore, the aforementioned RPC shall also be authorized to seek external expert advice as and when required.

## **CHAPTER NO. 4**

### **4.1 PROCEDURE FOR BLACKLISTING**

Upon receipt of or obtaining information and/or knowledge that any person(s) is involved in practices mentioned in Chapter-2 earlier, the concerned Project Authority / formation shall promptly formulate its recommendations and submit through MD NTDC to NTDC RPC along with its findings, details of charges and documentary evidences to initiate proceedings under this SOP.

### **4.2 INITIATION OF AN ACTION**

- (i) Within a period of 15 days after receiving the recommendations of Blacklisting / Debarment from the concerned Project Authority, the Convener of the Committee shall issue a Show Cause Notice (“**Notice**”) thereby informing the Person about the alleged charges and shall provide an opportunity to the defend said charges within a time period of 15 (fifteen) days.
- (ii) The person(s) shall be accorded adequate opportunity of hearing in order to defend the charges within the given timelines.
- (iii) The Notice to the Person shall be sent at the mailing/postal address as provided under the Contract or any other address provided by way of subsequent written communication by the Person. The non-receipt of the Notice due to incorrect / change in mailing address without any written communication shall not be attributable to NTDC. In case of non-receipt of any reply from the accused person within the formulated time, but not less than the time given in 4.2 (i) above, the Committee shall have the right to proceed on Ex-parte basis.

### **4.3 DECISION**

- i. The committee shall hold an independent inquiry/investigation as the case may be, and, which may include site visits and interviews with the parties concerned. The Committee shall complete the entire inquiry/investigation, preferably within a period of 30 days after receipt of response from the person against whom proceedings under this SOP have been initiated and shall present the report to the MD NTDC.

- ii. If required, the Committee may report the case to an appropriate law enforcement agency depending upon the nature of the case for detailed investigations with the prior approval of Managing Director (NTDC).
- iii. The person against whom proceedings have been initiated under this SOP shall not proceed for arbitration/litigation during the proceedings for blacklisting.

#### **4.4 COMMUNICATION OF DECISION**

After recommendation for blacklisting by “NTDC’s Rights Protection Committee (RPC)”, the person concerned shall be informed within 10 days of such decision. The decision of the Committee will be notified on NTDC’s and PPRA’s websites and shall also be conveyed to Pakistan Engineering Council. Blacklisting of firms shall also be conveyed by circular to other Government Departments. All other relevant procuring agencies including PEPCO, DISCOs, and WAPDA, etc., will also be informed simultaneously.

#### **4.5 PERIOD OF DEBARMENT FOR BLACKLISTED FIRMS**

- (i) The Blacklisting on the grounds and reasons specified herein above in Chapter No. 2 shall be for a reasonable specified period of time and as a general rule of prudence, the period may not exceed three years, except in cases where debarment/blacklisting has been done by any other government department or an International Financial Institution (Donor Agency).
- (ii) In case the person has been blacklisted by the government department or the International Financial Institution (donor agency), the period of blacklisting/debarment shall be for a maximum period of 3 years or the time period for which the concerned government department/International Financial Institution (Donor Agency) debarred the contractor (whichever is higher).

#### **4.6 ACTION AFTER PERSONS ARE PLACED ON BLACKLISTING LIST.**

- i. The decision of blacklisting will be immediately circulated to all concerned as mentioned at Clause 4.4 above.
- ii. In case of a contract already awarded to a person which has been blacklisted and termination is either not possible or not feasible, the concerned Project Authority may proceed in this case to complete the contract with the approval of Competent Authority.
- iii. The blacklisted person shall stand disqualified from bidding from the date of decision against them. Any pending bids shall also stand rejected. If a contract has



already been awarded to person, it shall be voidable at the option of NTDC as per 4.6 (ii) above.

- iv. A separate register or data base will be maintained for blacklisted firms indicating reasons and period.

#### **4.7 EFFECTIVENESS**

These guidelines / SOP or any amendments thereof shall take effect immediately after its approval from Board of Directors of NTDC.

## **APPENDIX-1**

### **PROCESS TO DEAL WITH FRIVOLOUS COMPLAINTS**

It has been frequently observed that after opening of tenders, the bidders start to influence the evaluation process. Such attempts result in delay in finalizing of award of contract and cause financial loss to the National exchequer. The evaluation process is confidential till publication of award of contract process.

Provision of guidelines of international donor agencies and PPRA provides sufficient opportunity to bidders for redressal of their grievances. Hence, the attempts made by the bidders during evaluation process or thereafter to influence the contract award decisions fall under the definition of corrupt and fraudulent practices. Therefore, during bidding stage, the following mechanism shall be adopted in case of receipt of any frivolous complaint from the bidder.

- i. Anonymous complaints shall not be entertained.
- ii. The Procuring Agency reserves the right to call for an affidavit from the complainant verifying the truthfulness and correctness of the contents of the complaint.
- iii. The notice of displeasure and explanation will be immediately sent to those persons who lodge frivolous complaint(s) during the evaluation process.
  - iii (a) If the person itself or through its agent or any third party does not refrain from making frivolous complaints in the same tender or any other tender, an official warning will be sent and their case may be sent to “NTDC’s Rights Protection Committee” which may analyse the situation and suggest action including the rejection of the bid of the complainant. However, Project Authority may reject the bid even in first instance depending upon nature of the case or provision of the Bidding Documents.
  - iii (b) If the same person itself or through its agent or any third party lodges a frivolous complaint in another tender floating in parallel before decision of the Grievance Committee, its bid will straight forwardly be rejected by the project authority. It may also be debarred to participate in the next tender for a minimum period of six months under intimation to the Grievance Committee and MD NTDC.
- iv. In order to monitor the record of the persons, a data base will be maintained at NTDC’s website and the offices of the project authorities regarding such persons who consistently lodge frivolous complaints during the evaluation process by making clandestine access to confidential record and hamper the award of contract process.

**NOTE: It is clarified that the process provided above in Appendix 1 is to discourage anonymous and frivolous complaints only, and does not bar any person feeling aggrieved by any act of the procuring agency from lodging a genuine complaint/grievance as provided under Rule 48 of the PPRA Rules, 2004.**

## APPENDIX-2

### **GUIDELINES FOR EVALUATION OF PERFORMANCE OF CONTRACTORS**

- i. After signing of the contract, the Project authority (or the Consultant / Engineer) must monitor and evaluate the Contractor's performance, that is, whether the Contractor is fulfilling his obligations based on the terms of the contract and plans that were developed and agreed upon with the Project authority at the time of signing of contract or during kick-off meetings..
- ii. Though the performance evaluation of any person is an on-going process, which takes place throughout the duration of the contract and also during the Defect Liability / Warranty Period, nevertheless, a person's Performance Evaluation Report may be prepared for the consumption and benefit of the procuring agency or for any other purpose at the completion of the project, as the case may be.
- iii. The performance evaluation report shall be prepared for all contracts of more than Rs. 100 million. When based on the Evaluation Report, the performance of a person is non-satisfactory, the procuring agency may initiate the case for blacklisting of the person in accordance with the terms of this SOP. For the avoidance of doubt, consistent failure to provide satisfactory performance shall also include performances in a single or multiple contracts executed or being executed by the same person, as the case may be.
- iv. In case of any extra-ordinary delay in performance of a single contract of vital and critical importance, the procuring agency shall have the right to initiate proceedings under this SOP and/or avail any other remedy provided under the law which may *interalia* include: termination of the contract, recovery of losses, debarring the person from participation in future tenders. The procuring agency shall be the sole judge to determine the projects of vital or critical importance.
- v. In case of ordinary delay in performance in 2 consecutive contracts within a period of 3 years, the procuring agency shall have the right to initiate proceedings under this SOP and/or avail any other remedy provided under the law which may *interalia* include: termination of the contract, recovery of losses, debarring the person from participation in future tenders.
- vi. The proceedings under this SOP shall not prejudice any other rights and/or remedies available to the procuring agency under the contract documents and/or any other law in force.

**ANNEXURE-B**

**NGC TYPE TEST POLICY**



## **NATIONAL TRANSMISSION & DESPATCH CO. LTD**

**Company Secretary**

No. NTDC/CS/ 2730-35

Dated: 03 - 02 - 2023

### **NOTIFICATION**

#### **Approval of revised NTDC type test policy**

The Board of Directors of National Transmission & Despatch Company Limited (NTDC) in its 240<sup>th</sup> meeting held on 20.01.2023 against additional agenda item No. 01 has resolved and approved the revised NTDC type test policy (Annex-A).

  
**Azhar Saleem**  
Company Secretary

**Copy to:**

1. Managing Director
2. All Deputy Managing Directors
3. Chief Financial Officer
4. General Manager (D&E)

## Type Test Requirements of NTDC (Revised Policy)

### 1 Foreword

- 1.1 This type test policy will come into effect at once and shall replace the existing type test policy which was issued in 2019.
- 1.2 This policy shall be applicable to:
- All Future Procurement
  - All ongoing Tenders
  - Only for those Contracts where approval of equipment/material is not accorded.
- 1.3 This policy consists of the following:
- Policy Document
  - Part-I contains the list of approved/STL member laboratories.
  - Part-II deals with the type testing of Grid Station Equipment.
  - Part-III deals with the type testing of Transmission Line Equipment.
- 1.4 Technical Committee of BOD may issue any amendment to this policy as and when required.

### 2 Type Test Policy

- 2.1 The bidder shall offer type tested equipment or if the equipment is not previously type tested, the type tests shall be carried out in line with relevant IEC/other international applicable standard as mentioned in the policy.
- 2.2 The type test policy covers the scope as given in Part-II and III of this policy. However, the equipment which are not mentioned in this type test policy shall be tested as per relevant NTDC specifications.
- 2.3 The Type Test reports shall remain valid unless and until.
- Voltage class has changed
  - Short Circuit level has changed <sup>1</sup>
  - The applicable standards have changed.
  - The design/construction has changed.
  - Manufacturing Facility has changed.

<sup>1</sup> If all other conditions mentioned under Clause 2.3 (i, iii, iv & v) are not violated, the dielectric tests shall be considered acceptable.

- 2.4 The Test Report shall include complete identification of the equipment and other necessary information as mentioned in the relevant IEC/ other international applicable standard along with drawings stamped by the concerned laboratory.
- 2.5 The following provisions have been made in this Policy with respect to bidding process:
- i. The Bidder shall submit an unconditional Undertaking, duly signed and stamped by bidder and supported by manufacturer(s) accordingly in technical bid, that in case of award of contract if submitted type test reports are not according to NTDC type test policy, he will carry out type tests as per NTDC Type Test Policy within the quoted Bid price and without affecting the delivery/ completion period as mentioned in the Bidding Documents. In case of failure to submit an Undertaking of type tests as per NTDC type test policy along with the bid or in response to post bid clarification:
    - a. In supply contract, bid shall be rejected.
    - b. In EPC contract, such manufacturer shall not be accepted, and bidder will be bound to replace the same with acceptable manufacturer. In case of noncompliance, the bid shall be rejected.
  - ii. within 07 days from approval of technical data/ drawings, the contractor shall submit schedule of type testing from laboratory.
  - iii. After award of contract, the bidder shall be required to perform requisite type tests before delivery of equipment without affecting the delivery/completion period as mentioned in the Bidding Document within the quoted bid price. In case of delay or non-compliance of the said requirement, NTDC reserves the right to cancel the contract agreement including encashment of performance guarantee and initiate the process for blacklisting as per NTDC SOP for blacklisting.

**Note:**

- a) For the purpose of type testing, latest IEC/ other applicable international standard as mentioned in the policy shall be applicable.
- b) For service conditions of material/equipment covered in this policy, the relevant NTDC specification shall be applicable.
- c) The manufacturers may avail this opportunity for carrying out type tests as per NTDC Policy. NTDC can also nominate its inspectors upon request provided that all such costs shall be borne by the manufacturer.
- d) NTDC reserves the right to change all or any parts of the type test policy at any time in the best interest of company.
- e) For test grouping, sampling and sequence for the type testing, the procedure/method mentioned in IEC/any other relevant international standard shall be applicable.
- f) For type test reports from ISO/IEC 17025 certified laboratories, as permitted in part II & III of the policy, in case of ambiguity in the independent status of the laboratory, the reports shall be acceptable upon providing the certificate from the manufacturer that the laboratory is independent from the manufacturer and offering extended warranty twice of the original.





- g) In case of contradiction between NTDC specification & this type test policy, this policy shall prevail.

Abdul Haq  
Manager (Tech), HV&SC Lab, Rawat  
(Member)

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Azhar Iqbal  
Manager(MP&M) NTDC  
(Member)

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Anees Ahmad  
Chief Engineer (T/L Design) NTDC  
(Member)

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Taqi-ud-din  
Chief Engineer (P&C) NTDC  
(Member)

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Shahid Shafi Sial  
Chief Engineer (SS Design) NTDC  
(Convener)

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## Part-I

### (List of Approved/STL member Laboratories)

1. All STL member Laboratories and their subsidiaries/affiliates mentioned on their website  
[www.stl-liaison.org/web/03\\_members.php](http://www.stl-liaison.org/web/03_members.php)
2. Kinectrics Laboratory  
800 Kipling Ave. Etobicoke, ON M8Z 5G5,  
Canada
3. Politecnico Di Milano  
Piazza Leonardo da Vinci, 32, 20133 Milan  
Italy
4. EGU HV Laboratory A.S  
Podnikatelska 267 190 11 Prague 9, Bechovice  
Czech Republic
5. High Voltage and Short Circuit (HV&SC) Laboratory  
Rawat, Islamabad, Pakistan
6. IREQ, Canada
7. CRIEPI, JAPAN
8. TUV Labs, Italy



## Part-II

### Grid Station Equipment

1. This part contains the type testing requirements relating to the Grid Station Equipment.
2. The Equipment / material covered under this policy is mentioned hereunder:
  - a. Circuit Breaker
  - b. Disconnecter
  - c. Inductive Voltage Transformer/Capacitive Voltage Transformer/CCVT
  - d. Current Transformer
  - e. Bushings (Transformers, Shunt Reactors & SF<sub>6</sub> to Air (GIS))
  - f. Gas Insulated Switchgear (GIS)
  - g. Surge Arrester
  - h. Post Insulators
  - i. Hardware (Connectors and Strings assemblies)
3. The type test to be performed on the above equipment from **Laboratories as per Part-I** of this policy are mentioned below:

| Sr. # | Equipment Name                                                                | Test to be performed                                                                                                                                                                                                                                |
|-------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 01    | <b>Circuit Breaker</b><br>(IEC 62271-100)                                     | i. Dielectric Tests<br>ii. Temperature-rise Tests<br>iii. Short-time withstand current and peak withstand current tests<br>iv. Short circuit current making and breaking tests                                                                      |
| 02    | <b>Disconnectors, Earth Switch and Fast Earth Switch</b><br>(IEC 62271-102)   | i. Dielectric Tests<br>ii. Continuous Current Tests<br>iii. Short-time withstand current and peak withstand current tests                                                                                                                           |
| 03a   | <b>Inductive Voltage Transformer (IVT)</b><br>(IEC 61869-1 & 61869-3)         | i. Temperature-rise test<br>ii. Impulse voltage withstand test on primary terminals<br>iii. Wet test for outdoor type transformers<br>iv. Chopped impulse voltage withstand test on primary terminals<br>v. Short circuit withstand capability test |
| 03b   | <b>Capacitive Voltage Transformer (CVT) / CCVT</b><br>(IEC 61869-1 & 61869-5) | i. Temperature-rise test<br>ii. Chopped impulse test<br>iii. Impulse voltage withstand test on primary terminals<br>iv. Wet test for outdoor type transformers<br>v. Short circuit withstand capability test                                        |
| 04    | <b>Current Transformer (CT)</b><br>(IEC 61869-1 & 61869-2)                    | i. Temperature-rise test<br>ii. Impulse voltage withstand test on primary terminals<br>iii. Wet test for outdoor type transformers<br>vi. Chopped impulse voltage withstand test on primary terminals<br>vii. Short-time current tests              |

| Sr. # | Equipment Name                                                                                              | Test to be performed                                                                                                                                                                                                                                                                                                                                                                                         |
|-------|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 05    | <b>Bushings (Transformer, Shunt Reactor, SF<sub>6</sub> to Air(GIS)) (IEC 60137)</b>                        | i. Wet power-frequency voltage withstand test<br>ii. Long duration power frequency voltage withstand test (Ur≥170kV)<br>iii. Lightning impulse voltage withstand test.<br>iv. Wet switching impulse voltage withstand test ((Ur≥300kV)<br>v. Temperature rise test.<br>vi. Verification of thermal short-time current withstand (if required)                                                                |
| 06    | <b>Gas Insulated Switchgear (GIS) (IEC 62271-203)</b>                                                       | i. Tests to verify the insulation level of the equipment and dielectric tests on auxiliary circuits<br>ii. Tests to prove the temperature rise of any part of the equipment and measurement of the resistance of the main circuit<br>iii. Tests to prove the rated peak and the rated short-time withstand current<br>iv. Tests to verify the making and breaking capacity of the included switching devices |
| 09a   | <b>Connectors (NEMA CC1 &amp; ANSI 119.4)</b>                                                               | i. Heat cycle Test<br>ii. RIV and Corona Tests                                                                                                                                                                                                                                                                                                                                                               |
| 09b   | <b>String Assemblies (Tension and Suspensions) (NTDC spec P-Draft and relevant international standards)</b> | i. Heat Cycle Test (Only for Tension clamp of Tension Assembly if its current carrying device)<br>ii. Corona Test                                                                                                                                                                                                                                                                                            |

4. All other type tests not mentioned in point-3 above but are required as per relevant IEC/international standard, may be performed as under:

| Sr. # | Equipment Name                                           | Test to be performed                                                                              | Requirement                                                                                                                                           |
|-------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| 01    | <b>Circuit Breaker</b>                                   | All other type tests not mentioned in point-3 above but are required as per IEC 62271-100         | i. Any Independent laboratory accredited by ISO/IEC 17025<br>ii. Any laboratory as per Part-I<br>iii. Inspection reports issued by any STL Laboratory |
| 02    | <b>Disconnectors, Earth Switch and Fast Earth Switch</b> | All other type tests not mentioned in point-3 above but are required as per IEC 62271-102         |                                                                                                                                                       |
| 03a   | <b>Inductive Voltage Transformer (IVT)</b>               | All other type tests not mentioned in point-3 above but are required as per IEC 61869-1 & 61869-3 |                                                                                                                                                       |
| 03b   | <b>Capacitive Voltage Transformer (CVT) / CCVT</b>       | All other type tests not mentioned in point-3 above but are required as per IEC 61869-1 & 61869-5 |                                                                                                                                                       |
| 04    | <b>Current Transformer (CT)</b>                          | All other type tests not mentioned in point-3 above but are required as per IEC 61869-1 & 61869-2 |                                                                                                                                                       |

| Sr. # | Equipment Name                                                                            | Test to be performed                                                                         | Requirement |
|-------|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-------------|
| 05    | <b>Bushings <sup>2</sup></b><br>(Transformer, Shunt Reactor, SF <sub>6</sub> to Air(GIS)) | All other type tests not mentioned in point-3 above but are required as per IEC 60137        |             |
| 06    | <b>Gas Insulated Switchgear (GIS)<sup>3</sup></b>                                         | All other type tests not mentioned in point-3 above but are required as per IEC 62271-203    |             |
| 07    | <b>Surge Arrester</b>                                                                     | All type tests as per IEC 60099-4                                                            |             |
| 08    | <b>Post Insulators (PI)</b>                                                               | All type tests as per IEC 60168 & 60273.                                                     |             |
| 09a   | <b>Connectors</b>                                                                         | All other type tests not mentioned in point-3 above but are required as per List in Annex-A. |             |
| 09b   | <b>String Assemblies</b>                                                                  | All other type tests not mentioned in point-3 above but are required as per List in Annex-A. |             |

**Note:** In case some tests are categorized as special test in the IEC/relevant international standard while the same are mentioned under type tests in NTDC relevant specification, the same may be performed as per requirement mentioned above.

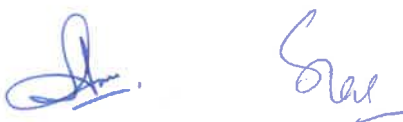
5. If the offered Circuit Breaker or Disconnecter has different continuous current rating than that of the type tested one, then only Temperature rise / continuous current test shall be re-performed from either of the following, provided that the type test reports do not violate the criteria as mentioned under clause 2(3) of this policy:
  - i. Any Independent laboratory accredited by ISO/IEC 17025
  - ii. Any laboratory as per Part-I
  - iii. Inspection report issued by any STL Laboratory
6. If the offered instrument transformer (IVT, CVT/CCVT or CT) has different ratio, VA burden, type of cores (protection & metering) or number of cores from the type tested one<sup>4</sup>, then only Temperature rise and accuracy tests shall be re-performed from either of the following, provided that the type test reports do not violate the criteria mentioned under Clause 2.3 of this policy:
  - i. Any Independent laboratory accredited by ISO/IEC 17025
  - ii. Any laboratory as per Part-I

<sup>2</sup> Transformer, Shunt Reactor and SF<sub>6</sub> Bushings shall either be from M/s Trench Hefley (France/ Switzerland); M/s Passoni & Villa Italy; M/s F&G Germany & M/s ABB Sweden which have proven performance in NTDC system or pre-type tested bushings from an equivalent manufacturer duly tested in accordance with this policy.

<sup>3</sup> Apart from the tests mentioned in IEC for GIS, the following major equipment of GIS shall be type tested in accordance with relevant IEC standards and this policy:

- a) Instrument Transformer Switch
- b) Circuit Breaker
- c) Disconnecter, Earthing Switch and Fast Earthing

<sup>4</sup> The number of cores for the type tested current transformer shall be higher or equal than the offered current transformer.





- iii. Inspection reports issued by any STL Laboratory
7. Chief Engineer (SS Design) NTDC shall be sole judge for the interpretation / applicability for this policy relating to the equipment / material mentioned under Part-II.
8. Chief Engineer (SS Design) NTDC may issue any clarification as and when required relating to Part-II of this policy.

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### Part-III Transmission Line Equipment

1. This part contains the type testing requirements relating to the Transmission Line Equipment.
2. The Equipment / material covered under this policy is mentioned hereunder:
  - a. Conductor
  - b. Hardware and accessories
  - c. Spacer dampers
  - d. Stock Bridge Vibration Dampers
  - e. Insulators (Toughened Glass/Porcelain/Non-Ceramic Composite)
  - f. RTV Coating Material
  - g. OPGW
  - h. FOC
3. Chief Engineer (TL Design) NTDC shall be the sole judge for the interpretation / applicability for this policy relating to the equipment / material mentioned under Part-III.
4. Chief Engineer (TL Design) NTDC may issue any clarification as and when required relating to Part-III of this policy.
5. The type tests to be performed on the above equipment from **Labs as per Part-I** of this policy, or otherwise as mentioned against each test, are given in table below:
6. Visual examination, dimensional check and material verification, etc. of the samples to be tested shall be carried out and made part of test report before conducting each of the type test.

| S. # | Equipment Name                         | Tests to be performed |                                                            | Relevant Standard                                                                                                | Testing Labs                                                                                                                                         |
|------|----------------------------------------|-----------------------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | <b>Conductor</b>                       | i.                    | Stress – Strain Test/Stress – Strain Curves                | NTDC Specification & relevant IEC/ any other International Standards mentioned in NTDC Specification. IEC 61089. | a. Any lab as mentioned in Part-I;<br>b. Any Independent lab accredited by ISO/IEC 17025;<br>c. Tests at manufacturer's Lab under witness of STL Lab |
|      |                                        | ii.                   | Joints in Aluminum Alloy/Aluminum Wires                    |                                                                                                                  |                                                                                                                                                      |
|      |                                        | iii.                  | Ultimate Tensile Strength and Longitudinal Smoothness Test |                                                                                                                  |                                                                                                                                                      |
| 2    | <b>Porcelain/ Glass Disc Insulator</b> | i.                    | Dry Power Frequency Withstand Voltage Test                 | NTDC Specification & relevant IEC/ any other International Standards mentioned in                                | a. Any lab as mentioned in Part-I.                                                                                                                   |
|      |                                        | ii.                   | Wet Power Frequency Withstand Voltage Test                 |                                                                                                                  |                                                                                                                                                      |
|      |                                        | iii.                  | Dry Lightning Impulse Withstand Voltage Test               |                                                                                                                  |                                                                                                                                                      |



| S. # | Equipment Name                        | Tests to be performed |                                                                                                                                                                                                                                                                                                                   | Relevant Standard                                                                                                                                | Testing Labs                                                                                                                                         |
|------|---------------------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |                                       | iv.                   | Radio Interference Voltage (RIV) test                                                                                                                                                                                                                                                                             | NTDC Specification. IEC 60383, IEC 60437, IEC 61211, IEC 61467, IEC 60507                                                                        | a. Any lab as mentioned in Part-I.<br>b. Any Independent lab accredited by ISO/IEC 17025;<br>c. Tests at manufacturer's Lab under witness of STL Lab |
|      |                                       | v.                    | Thermal-Mechanical Performance test                                                                                                                                                                                                                                                                               |                                                                                                                                                  |                                                                                                                                                      |
|      |                                       | vi.                   | Steep Wave Front Impulse test                                                                                                                                                                                                                                                                                     |                                                                                                                                                  |                                                                                                                                                      |
|      |                                       | vii.                  | Power Arc test (Short String)                                                                                                                                                                                                                                                                                     |                                                                                                                                                  |                                                                                                                                                      |
|      |                                       | viii.                 | Combined Mechanical and Electrical Strength Test                                                                                                                                                                                                                                                                  |                                                                                                                                                  |                                                                                                                                                      |
|      |                                       | ix.                   | Residual Strength test                                                                                                                                                                                                                                                                                            |                                                                                                                                                  |                                                                                                                                                      |
|      |                                       | x.                    | Impact test                                                                                                                                                                                                                                                                                                       |                                                                                                                                                  |                                                                                                                                                      |
|      |                                       | xi.                   | Artificial Pollution Performance test                                                                                                                                                                                                                                                                             |                                                                                                                                                  |                                                                                                                                                      |
| 3    | Non-Ceramic Composite Insulator Units | i.                    | <b>Tests on interfaces and connections of end fittings:</b><br>a) Sudden load release pre-stressing<br>b) Thermal-mechanical pre-stressing<br>c) Water immersion pre-stressing<br>d) Verification tests<br>i. Visual Examination<br>ii. Steep-front impulse voltage test<br>iii. Dry power-frequency voltage test | NTDC Specification & relevant IEC/ any other International Standards mentioned in NTDC Specification. IEC 61109, IEC 62217, IEC 61467, IEC 60507 | a. Any lab as mentioned in Part-I                                                                                                                    |
|      |                                       | ii.                   | <b>Tests on shed and housing material:</b><br>a) Accelerated weathering test<br>b) Tracking and erosion test<br>c) Artificial Pollution test<br>d) Flammability test<br>e) Hardness test                                                                                                                          |                                                                                                                                                  | a. Any lab as mentioned in Part-I                                                                                                                    |
|      |                                       | iii.                  | <b>Tests on core material:</b><br>i. Dye penetration test                                                                                                                                                                                                                                                         |                                                                                                                                                  | a. Any lab as mentioned in Part-I;<br>b. Any Independent lab accredited by ISO/IEC 17025;<br>c. Tests at manufacturer's                              |
|      |                                       |                       |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                  |                                                                                                                                                      |
|      |                                       |                       |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                  |                                                                                                                                                      |



| S. # | Equipment Name                                                                                              | Tests to be performed |                                                                                                                                                                                                                                                   | Relevant Standard                                                                                                                                             | Testing Labs                                                                                  |
|------|-------------------------------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
|      |                                                                                                             |                       |                                                                                                                                                                                                                                                   |                                                                                                                                                               | Lab under witness of STL Lab                                                                  |
|      |                                                                                                             |                       | ii. Water diffusion test                                                                                                                                                                                                                          |                                                                                                                                                               |                                                                                               |
|      |                                                                                                             | iv.                   | <b>Assembled core-load time test:</b><br>a) Determination of the average failing load of the core of the assembled insulator<br>b) Verification of the 96 h withstand load<br>c) Control of the slope of the strength-time curve of the insulator |                                                                                                                                                               | a. Any lab as mentioned in Part-I;<br>b. Tests at manufacturer's Lab under witness of STL Lab |
|      |                                                                                                             | v.                    | Damage limit proof test and test of the tightness of the interface between end fittings and insulator housing                                                                                                                                     |                                                                                                                                                               |                                                                                               |
|      |                                                                                                             | vi.                   | High pressure water withstand test                                                                                                                                                                                                                |                                                                                                                                                               |                                                                                               |
|      |                                                                                                             | vii.                  | Brittle fracture resistance test                                                                                                                                                                                                                  |                                                                                                                                                               |                                                                                               |
|      |                                                                                                             | viii.                 | Torsional load test                                                                                                                                                                                                                               |                                                                                                                                                               |                                                                                               |
|      |                                                                                                             | ix.                   | Grading device test                                                                                                                                                                                                                               |                                                                                                                                                               |                                                                                               |
|      |                                                                                                             | x.                    | Recovery of hydrophobicity test                                                                                                                                                                                                                   |                                                                                                                                                               |                                                                                               |
|      |                                                                                                             | xi.                   | Artificial Pollution Performance Test                                                                                                                                                                                                             |                                                                                                                                                               |                                                                                               |
| 4    | Complete Hardware String with fittings including insulators for Composite /Porcelain/ Glass Disc Insulators | i.                    | Wet Power Frequency test                                                                                                                                                                                                                          | NTDC Specification & relevant IEC/ any other International Standards mentioned in NTDC Specification. IEC 60383, IEC 60060-1, IEC 61109, IEC 61467, IEC 61284 | a. Any lab as mentioned in Part-I;                                                            |
|      |                                                                                                             | ii.                   | Dry Lightning Impulse Withstand Voltage test                                                                                                                                                                                                      |                                                                                                                                                               |                                                                                               |
|      |                                                                                                             | iii.                  | Wet Switching Impulse Withstand Voltage test (for voltages $\geq 500\text{kV}$ )                                                                                                                                                                  |                                                                                                                                                               |                                                                                               |
|      |                                                                                                             | iv.                   | Power Arc test                                                                                                                                                                                                                                    |                                                                                                                                                               |                                                                                               |
|      |                                                                                                             | v.                    | Corona and RIV test                                                                                                                                                                                                                               |                                                                                                                                                               |                                                                                               |
|      |                                                                                                             | vi.                   | Voltage Distribution Test                                                                                                                                                                                                                         |                                                                                                                                                               |                                                                                               |
|      |                                                                                                             | vii.                  | Mechanical Strength test                                                                                                                                                                                                                          |                                                                                                                                                               |                                                                                               |
| 5    | Conductor/ OPGW/ Shield wire Hardware & Accessories                                                         | i.                    | Heat Cycle test                                                                                                                                                                                                                                   | NTDC Specification & relevant IEC/ any other International Standards mentioned in                                                                             | a. Any lab as mentioned in Part-I;                                                            |
|      |                                                                                                             | ii.                   | Magnetic Loss test                                                                                                                                                                                                                                |                                                                                                                                                               |                                                                                               |
|      |                                                                                                             | iii.                  | Fault Current Test                                                                                                                                                                                                                                |                                                                                                                                                               |                                                                                               |
|      |                                                                                                             | iv.                   | Corona & RIV Test                                                                                                                                                                                                                                 |                                                                                                                                                               |                                                                                               |
|      |                                                                                                             | v.                    | Power Arc Test                                                                                                                                                                                                                                    |                                                                                                                                                               |                                                                                               |
|      |                                                                                                             | vi.                   | Galvanization test                                                                                                                                                                                                                                |                                                                                                                                                               |                                                                                               |

| S. # | Equipment Name                     | Tests to be performed |                                                                         | Relevant Standard                                                                                                                                   | Testing Labs                                            |
|------|------------------------------------|-----------------------|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
|      |                                    | vii.                  | Resistance to Conductor/OPGW/ Shield wire Slippage test                 | NTDC Specification. IEC 61284                                                                                                                       | a. Any lab as mentioned in Part-I;                      |
|      |                                    | viii.                 | Mechanical test on complete string                                      |                                                                                                                                                     | b. Any Independent lab accredited by ISO/IEC 17025;     |
|      |                                    | ix.                   | Tensile Tests on individual hardware items                              |                                                                                                                                                     | c. Tests at manufacturer's Lab under witness of STL Lab |
| 6    | RTV Coating Material               | i.                    | Inclined Plane Tracking & Erosion Test                                  | NTDC Specification & relevant IEC/ any other International Standards mentioned in NTDC Specification. IEC 60587, IEC 61109, IEC 60507, IEC TS 62073 | a. Any lab as mentioned in Part-I                       |
|      |                                    | ii.                   | Accelerated Weathering Test (1000 Hours)                                |                                                                                                                                                     |                                                         |
|      |                                    | iii.                  | Hydrophobicity Recovery by Corona Test Method                           |                                                                                                                                                     |                                                         |
|      |                                    | iv.                   | Dry Arc Resistance                                                      |                                                                                                                                                     |                                                         |
|      |                                    | v.                    | Dielectric Strength Test                                                |                                                                                                                                                     |                                                         |
|      |                                    | vi.                   | Volume & Surface Resistivity Test                                       |                                                                                                                                                     | a. Any lab as mentioned in Part-I;                      |
|      |                                    | vii.                  | Dissipation Factor Test                                                 |                                                                                                                                                     | b. Any Independent lab accredited by ISO/IEC 17025;     |
|      |                                    | viii.                 | Artificial Pollution Test by Salt Fog Method                            |                                                                                                                                                     | c. Tests at manufacturer's Lab under witness of STL Lab |
|      |                                    | ix.                   | Angle of Hydrophobicity                                                 |                                                                                                                                                     |                                                         |
| 7    | Spacer Damper (Twin, Triple, Quad) | i.                    | Corona & RIV Test                                                       | NTDC Specification & relevant IEC/ any other International Standards mentioned in NTDC Specification. IEC 61854                                     | a. Any lab as mentioned in Part-I;                      |
|      |                                    | ii.                   | Simulated Short Circuit Current Test                                    |                                                                                                                                                     |                                                         |
|      |                                    | iii.                  | Flexibility Test                                                        |                                                                                                                                                     |                                                         |
|      |                                    | iv.                   | Energy Absorbing Test                                                   |                                                                                                                                                     |                                                         |
|      |                                    | v.                    | Simulated Oscillation Fatigue Test                                      |                                                                                                                                                     |                                                         |
|      |                                    | vi.                   | Conical Fatigue Test                                                    |                                                                                                                                                     |                                                         |
|      |                                    | vii.                  | Characterization of Elastic and Damping Properties                      |                                                                                                                                                     |                                                         |
|      |                                    | viii.                 | Damping studies/ verification of vibration behavior by Computer Program |                                                                                                                                                     |                                                         |
|      |                                    | ix.                   | Galvanization                                                           |                                                                                                                                                     |                                                         |
|      |                                    | x.                    | Clamp Slippage Test<br>• Longitudinal Slip<br>• Torsional Slip          |                                                                                                                                                     | a. Any lab as mentioned in Part-I;                      |




| S. # | Equipment Name                                                   | Tests to be performed |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Relevant Standard                                                                                               | Testing Labs                                                                                                                                                                                   |
|------|------------------------------------------------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |                                                                  | xi.                   | Bolt Torque Test                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                 | b. Any Independent lab accredited by ISO/IEC 17025;<br>c. Tests at manufacturer's Lab under witness of STL Lab                                                                                 |
|      |                                                                  | xii.                  | Electrical Resistance Test                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                 |                                                                                                                                                                                                |
|      |                                                                  | xiii.                 | <b>Elastomer Tests:</b><br>a) Temperature endurance test<br>b) Temperature sensitivity test<br>c) Specific Gravity and Density Test<br>d) Shore A Hardness Test<br>e) Electrical Resistance Test<br>f) Ultraviolet Resistance Test<br>g) Ozone Resistance Test<br>h) Tension and Elongation Test<br>i) Tear Resistance Test<br>j) Compression Set at 70h, 20°C-100°C-0°C<br>k) Rebound Resilience at 20°C-100°C-0°C<br>l) Air-Oven Deterioration Test 72h, 70°C<br>m) Deterioration in Oils 72h, 70°C<br>n) Water Immersion Test<br>o) Abrasion test |                                                                                                                 | a. Any lab as mentioned in Part-I;<br><br>a. Any lab as mentioned in Part-I;<br>b. Any Independent lab accredited by ISO/IEC 17025;<br>c. Tests at manufacturer's Lab under witness of STL Lab |
| 8    | Stockbridge Vibration Damper (for Conductor, Shield wire & OPGW) | i.                    | Corona & RIV Test ( <i>only on SB Vibration Dampers for HV conductor</i> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | NTDC Specification & relevant IEC/ any other International Standards mentioned in NTDC Specification. IEC 61897 | a. Any lab as mentioned in Part-I;                                                                                                                                                             |
|      |                                                                  | ii.                   | Damper Performance Tests, which include the below:<br>a. Damper Characteristic Test<br>b. Damper Effectiveness Evaluation<br>c. Verification of Vibration Behavior by Computer Program / Damping Studies                                                                                                                                                                                                                                                                                                                                             |                                                                                                                 |                                                                                                                                                                                                |
|      |                                                                  | iii.                  | Vertical Fatigue Test                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                 |                                                                                                                                                                                                |
|      |                                                                  | iv.                   | Galvanization                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                 |                                                                                                                                                                                                |
|      |                                                                  | v.                    | Clamp Slippage Test                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                 |                                                                                                                                                                                                |




| S. # | Equipment Name                   | Tests to be performed |                                               | Relevant Standard                          | Testing Labs                                                                                                                                         |
|------|----------------------------------|-----------------------|-----------------------------------------------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |                                  | vi.                   | Bolt Torque Test                              |                                            | a. Any lab as mentioned in Part-I;<br>b. Any Independent lab accredited by ISO/IEC 17025;<br>c. Tests at manufacturer's Lab under witness of STL Lab |
|      |                                  | vii.                  | Attachment of Weights to Messenger Cable Test |                                            |                                                                                                                                                      |
|      |                                  | viii.                 | Attachment of Clamp to Messenger Cable Test   |                                            |                                                                                                                                                      |
| 9    | OPGW (Optical Fiber Ground Wire) | i.                    | Performance Tests                             | IEEE-1138-2009 or Equivalent IEC Standards | a. Any lab as mentioned in Part-I;<br>b. Any Independent lab accredited by ISO/IEC 17025;<br>c. Tests at manufacturer's Lab under witness of STL Lab |
|      |                                  | ii.                   | Electrical tests                              |                                            |                                                                                                                                                      |
|      |                                  | iii.                  | Mechanical tests                              |                                            |                                                                                                                                                      |
|      |                                  | iv.                   | Environment test                              |                                            |                                                                                                                                                      |
| 10   | FOC (Fiber Optic Cable)          | i.                    | Performance Test                              | IEEE-1138-2009                             | a. Any lab as mentioned in Part-I;<br>b. Any Independent lab accredited by ISO/IEC 17025;<br>c. Tests at manufacturer's Lab under witness of STL Lab |
|      |                                  | ii.                   | Electrical tests                              | ITU-TG 652 D                               |                                                                                                                                                      |
|      |                                  | iii.                  | Mechanical tests                              | ASTM B398 B398 M, B415                     |                                                                                                                                                      |
|      |                                  | iv.                   | Environment test                              | or Equivalent IEC Standards                |                                                                                                                                                      |

-----End of Document-----




## Annex-A

### Type Tests for Grid Station Hardware

#### 1. Connectors (NEMA CC1 & ANSI 119.4)

- i. Heat cycle Test
- ii. RIV and Corona Tests
- iii. Mechanical Composition Test
- iv. Tensile Strength Test
- v. Elongation Test
- vi. Brinell Hardness Test
- vii. Cantilever Test
- viii. Corrosion Test
- ix. Mechanical Oscillation Test (*applicable on multi-angular connectors only*)
- x. Electrical Resistance Test
- xi. Temperature Rise Test
- xii. Tightening Torque Test

#### 2. String Assemblies (Tension and Suspensions)

(NTDC spec P-Draft and relevant international standards)

- iii. Heat Cycle Test (Only for Tension clamp of Tension Assembly if its current carrying device)
- iv. Corona Test
- v. Mechanical Test
- vi. Resistance to Conductor Slippage Test
- vii. Resistance Test (only for Tension clamp of Tension Assembly)

