Invitation for Bids

INVITATION FOR BIDS

Date: June 04, 2026
Bid Reference No.: TLC-18(R)-2026

1. National Grid Company of Pakistan (NGC) (Formerly NTDC) "the Employer", intends to get the Works done for **Contract No. TLC-18(R)-2026** through NGC own resources. The Scope of Works is construction and completion of Civil Works, Erection, Stringing, Testing & Commissioning of 500kV D/C Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station, using ACSR "Bunting" Conductor **Lot-I: 500kV Double Circuit Quad Bundle Transmission Line from Tower No. 01 Near Sangal to Tower No. 69 Near Potha Sharif (23.5 km)**

2. The Employer invites sealed bids from eligible firms or persons licensed by the Pakistan Engineering Council in the appropriate category for the above scope of Works. National Competitive Bidding (NCB) will be conducted in accordance with PEC Single Stage-Two Envelope (SSTE) procedure.

3. Bidders may obtain further information from, inspect at and acquire the Bidding Documents from the office of the Employer, at:

Chief Engineer (MP&M), NGC,
8th Floor, Shaheen Complex,
Egerton Road, Lahore-Pakistan
Telephone No. 92-42-99202597
Fax No. 92-42-99202173
E-mail address: cempm@ntdc.com.pk

4. A complete set of Bidding Documents may be purchased by an interested Bidder on submission of a written application to the above office upon payment of a non-refundable fee of 5000 from Office of CE (MP&M).The method of payment will be by bank draft from any scheduled bank in Pakistan in favor of CE (MP&M) NGC, 8th Floor - Shaheen Complex, Egerton Road, Lahore for TLC-18(R)-2026.

5. The bidder as a main contractor (as single entity or as JV partner or approved subcontractor) must have substantially completed construction contract(s) comprising of detailed survey, sub-soil investigations, construction of tower conventional foundations, erection of towers, stringing, testing & commissioning of following:

Lot-I:

- One (1) 500kV or higher voltage or three (3) 220kV or higher bundled transmission lines of at least **11.75km** strung by controlled tension method during last ten (10) years.

*If the Bidder has executed these contract(s) as a JV partner, he shall have carried out all the activities mentioned here before.

* For purpose of this clause, the experience shall be evidenced through Completion

Certificates/Taking over Certificates etc. showing substantial completion of works.

i) Such transmission lines must have been operating successfully for at least two (02) years prior to deadline for submission of bids.

ii) In case the bid is submitted by a joint venture under this bidding process, lead partners shall meet the above experience criteria.

iii) Each JV partner other than the lead partner must have completed as a main contractor, JV partner or approved sub-contractor construction contract(s) comprising of detailed survey, sub-soil investigations, construction of tower conventional foundations, erection of towers, stringing, testing & commissioning of 220kV or higher voltage bundled transmission lines of at least **5.875km** strung by controlled tension method during last ten (10) years.

iv) The Bidder shall submit with the Bid evidence in this regard including inter alia copies (with English translation) of the contract agreement(s), substantial completion certificate(s) and Defects Liability Certificate, duly notarized, for the contract(s).

v) The bidder shall have his own tension / stringing equipment along with associated T&P and critical equipment as per requirement of the project duly supported with documentary evidence/catalogues/drawings for undertaking such like works in good working condition. Alternatively, if not so, the bidder will identify the confirmed source of the said machinery, T&P etc. along with documentary evidence/catalogues/drawings and shall provide necessary guarantee/surety that he will arrange the said equipment in good working condition through its own resources prior to start of stringing activity. The aforementioned documentary evidence shall be submitted with the bid.

vi) **Special Criteria**
The bidder or his proposed subcontractor shall have experience of normal piling or piling in river crossing during the last (05) five years.

6. All bids must be accompanied by a Bid Security in the amount specified for respective Lot in the Bidding Data in the format of bank guarantee on bid security form provided or in the form of deposit at call or from a Scheduled Bank in Pakistan in favor of Employer.

7. The bids must be delivered to the above office on or before **July 1, 2026** at 11:00 am. Bids will be opened at 11:30 am on the same day, in the presence of Bidder's representatives who choose to attend at the same address. The Pre-Bid meeting will be conducted on **June 15, 2026** at 11:00 am.

8. NGC reserve all its rights regarding rejection of bids as defined in Clause 33(1) of PPRA Rules 2004.

NATIONAL GRID COMPANY OF PAKSITAN LTD (NGC)
(Formerly NTDC)

BIDDING DOCUMENT NO. TLC-18(R)-2026

Civil Works, Erection, Stringing, Testing & Commissioning

of

500kV Double Circuit Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station, using ACSR "Bunting" Conductor

Lot-I: 500kV Double Circuit Quad Bundle Transmission Line from Tower No. 01 Near Sangal to Tower No. 69 Near Potha Sharif (23.5 km)

UNDER NGC'S OWN RESOURCES

SINGLE STAGE TWO ENVELOPE

VOLUME-1

(Commercial & Technical Conditions)

MAY, 2026

NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LIMITED

P&M DIVISION, NESPAK HOUSE, 1-C, BLOCK N, MODEL TOWN EXTENSION, LAHORE, PAKISTAN

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SECTION I

INSTRUCTIONS TO BIDDERS

A. GENERAL

IB.1 Scope of Bid

1.1 The Employer as defined in the Section-II Bid Data Sheet (BDS) hereinafter called "the Employer" wishes to receive bids for the construction and completion of works as described in these Bidding Documents, and summarized in the BDS hereinafter referred to as the "Works".

1.2 The successful bidder will be expected to complete the Works within the time specified in Appendix-A to Bid.

IB.2 Source of Funds

2.1 The Employer has applied for/received a loan/credit from the source (s) indicated in the BDS in various currencies towards the cost of the project specified in the BDS and it is intended that part of the proceeds of this loan/credit will be applied to eligible payments under the Contract for which these Bidding Documents are issued.

IB.3 Eligible Bidders

3.1 This Invitation for Bids is open to all bidders meeting the following requirements:

a. Duly licensed by the Pakistan Engineering Council (PEC) in the category relevant to the value of the Works.
b. Duly prequalified/enlisted with the Employer.

IB.4 One Bid per Bidder

4.1 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.16) will be disqualified.

IB.5 Cost of Bidding

5.1 The bidders shall bear all costs associated with the preparation and submission of their bids and the Employer will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

IB.6 Site Visit

6.1 The bidders are advised to visit and examine the Site of Works and its surroundings and obtain for themselves on their own responsibility all information that may be necessary for preparing the bid and entering into a contract for construction of the Works. All cost in this respect shall be at the bidder's own expense.

6.2 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.

B. BIDDING DOCUMENTS

IB.7 Contents of Bidding Documents

7.1 The Bidding Documents, in addition to invitation for bids, are those stated below and should be read in conjunction with any Addenda issued in accordance with Clause IB.9.

1. Instructions to Bidders (ITB).
2. Bid Data Sheet (BDS).
3. General Conditions of Contract, Part-I (GCC).
4. Particular Conditions of Contract, Part-II (PCC).
5. Specifications – Special Provisions.
6. Specifications - Technical Provisions.
7. Form of Bid & Appendices to Bid.
8. Bill of Quantities
9. Form of Bid Security.
10. Form of Contract Agreement.
11. Forms of Performance Security and Mobilization Advance Guarantee/Bond.
12. Drawings.

7.2 The bidders are expected to examine carefully the contents of all the above documents. Failure to comply with the requirements of bid submission will be at the Bidder's own risk. Pursuant to Clause IB.26, bids which are not substantially responsive to the requirements of the Bidding Documents will be rejected.

IB.8 Clarification of Bidding Documents

8.1 Any prospective bidder requiring any clarification(s) in respect of the Bidding Documents may notify the Employer in writing at the Employer's address indicated in the Invitation

for Bids. The Employer will respond to any request for clarification which he receives earlier than 28 days prior to the deadline for submission of bids.

Copies of the Employer's response will be forwarded to all the prospective Bidders who purchased the Bidding Documents, including a description of the enquiry but without identifying its source.

IB.9 Amendment of Bidding Documents

9.1 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.

9.2 Any addendum thus issued shall be part of the Bidding Documents pursuant to Sub-Clause 7.1 hereof and shall be communicated in writing to all Employers of the Bidding Documents. Prospective bidders shall acknowledge receipt of each addendum in writing to the Employer.

9.3 To afford prospective bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer may extend the deadline for submission of bids in accordance with Clause IB.20

C. PREPARATION OF BIDS

IB.10 Language of Bid

10.1 The bid and all correspondence and documents related to the bid exchanged by a bidder and the Employer shall be in the bid language stipulated in the BDS and Particular Conditions of Contract. Supporting documents and printed literature furnished by the bidders may be in any other language provided the same are accompanied by an accurate translation of the relevant parts in the bid language, in which case, for purposes of evaluation of the bid, the translation in bid language shall prevail.

IB.11 Documents Accompanying the Bid

11.1 Each bidder shall:

(a) submit a written power of attorney authorizing the signatory of the bid to act for and on behalf of the bidder;

(b) update the information indicated and listed in the Bidding Data and previously submitted with the application for prequalification, and continue to meet the

minimum criteria set out in the prequalification documents which as a minimum, would include the following:

(i) Evidence of access to financial resources alongwith average annual construction turnover;
(ii) Financial predictions for the current year and the two following years including the effect of known commitments;
(iii) Work commitments since prequalification;
(iv) Current litigation information; and
(v) Availability of critical equipment.

and

(c) furnish a technical proposal taking into account the various Appendices to Bid specially the following:

Appendix-E to Bid	Proposed Construction Schedule
Appendix-F to Bid	Method of Performing the Work
Appendix-G to Bid	List of Major Equipment
Appendix-M to Bid	Organization Chart for Supervisory Staff

and other pertinent information such as mobilization programme etc;

11.2 Bids submitted by a joint venture of two (2) or more firms shall comply with the following requirements:

(a) the bid and in case of a successful bid, the Form of Contract Agreement shall be signed so as to be legally binding on all partners;
(b) 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;
(c) the partner-in-charge shall always be duly authorized to deal with the Employer regarding all matters related with and/or incidental to the execution of Works as per the terms and Conditions of Contract and in this regard to incur any and all liabilities, receive instructions, give binding undertakings and receive payments on behalf of the joint venture;
(d) all partners of the joint venture shall at all times and under all circumstances be liable jointly and severally for the execution of the Contract in accordance with the Contract terms and a statement to this effect shall be included in the authorization mentioned under Sub-Para(b) above as well as in the Form of Bid and in the Form of Contract Agreement (in case of a successful bid); and
(e) 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.

11.3 Bidders shall also submit proposals of work methods and schedule, in sufficient detail to demonstrate the adequacy of the Bidders' proposals to meet the technical specifications and the completion time referred to in Sub-Clause 1.2 hereof.

IB.12 Bid Prices

12.1 Unless stated otherwise in the Bidding Documents, the Contract shall be for the whole of the Works as described in Sub-Clause 1.1 hereof, based on the unit rates and / or prices submitted by the bidder.

12.2 The bidders shall fill in rates and prices for all items of the Works described in the Bill of Quantities. 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 Bill of Quantities.

12.3 All duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause, as on the date 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 Sub-Clause 70.2 of the General Conditions of Contract Part-I.

12.4 The rates and prices quoted by the bidders are subject to adjustment during the performance of the Contract in accordance with the provisions of Clause 70 of the Conditions of Contract. The bidders shall furnish the prescribed information for the price adjustment formulae in Appendix-C to Bid, and shall submit with their bids such other supporting information as required under the said Clause.

IB.13 Currencies of Bid and Payment

13.1 The bidder shall quote the unit rates and the prices entirely in Pak rupees. A bidder expecting to incur expenditures in other currencies for inputs to the Works supplied from outside the Employer's country (referred to as the "Foreign Currency Requirements") shall indicate the same in Appendix-B to Bid. The proportion of the Bid Price (excluding Provisional Sums) needed by him for the payment of such Foreign Currency Requirements either (i) entirely in the

currency of the Bidder's home country or, (ii) at the bidder's option, entirely in Pak rupees provided always that a bidder expecting to incur expenditures in a currency or currencies other than those stated in (i) and (ii) above for a portion of the foreign currency requirements, and wishing to be paid accordingly, shall indicate the respective portions in his bid.

13.2 The rates of exchange to be used by the bidder for currency conversion shall be the TT&OD Selling Rates published or authorized by the State Bank of Pakistan prevailing on the date 28 days prior to the deadline for submission of bids.

For the purpose of payments, the exchange rates used in bid preparation shall apply for the duration of the Contract.

IB.14 Bid Validity

14.1 Bids shall remain valid for the period stipulated in the BDS after the Date of Bid Opening specified in Clause IB.23.

14.2 In exceptional circumstances, prior to expiry of the original bid validity period, the Employer may request that the bidders extend the period of validity for a specified additional period which shall in no case be more than the original bid validity period. The request and the responses thereto shall be made in writing. A bidder may refuse the request without forfeiting his Bid Security. A bidder agreeing to the request will not be required or permitted to modify his bid, but will be required to extend the validity of his Bid Security for the period of the extension, and in compliance with Clause IB.15 in all respects.

IB.15 Bid Security

15.1 Each bidder shall furnish, as part of his bid, a Bid Security in the amount stipulated in the BDS in Pak Rupees or an equivalent amount in a freely convertible currency.

15.2 The Bid Security shall be, at the option of the bidder, in the form of Deposit at Call or a Bank Guarantee issued by a Scheduled Bank in Pakistan or from a foreign bank duly counter guaranteed by a Scheduled Bank in Pakistan in favour of the Employer valid for a period 28 days beyond the Bid Validity date.

15.3 Any bid not accompanied by an acceptable Bid Security shall be rejected by the Employer as non-responsive.

15.4 The bid securities of unsuccessful bidders will be returned as promptly as possible, but not later than 28 days after the expiration of the period of Bid Validity.

15.5 The Bid Security of the successful bidder will be returned when the bidder has furnished the required Performance Security and signed the Contract Agreement.

15.6 The Bid Security may be forfeited:

(a) if the bidder withdraws his bid except as provided in Sub-Clause 22.1;

(b) if the bidder does not accept the correction of his Bid Price pursuant to Sub-Clause 27.2 hereof; or

(c) if the bidder is involved in Corrupt and/or fraudulent practices.

(d) In the case of successful bidder, if he fails within the specified time limit to:

(i) furnish the required Performance Security; or

(ii) sign the Contract Agreement.

IB.16 Alternate Proposals by Bidder

16.1 Should any bidder consider that he can offer any advantages to the Employer by a modification to the designs, specifications or other conditions, he may, in addition to his bid to be submitted in strict compliance with the Bidding Documents, submit any Alternate Proposal(s) containing (a) relevant design calculations; (b) technical specifications; (c) proposed construction methodology; and (d) any other relevant details / conditions, provided always that the total sum entered on the Form of Bid shall be that which represents complete compliance with the Bidding Documents.

16.2 Alternate Proposal(s), if any, of the lowest evaluated responsive bidder only may be considered by the Employer as the basis for the award of Contract to such bidder.

IB.17 Pre-Bid Meeting

17.1 The Employer 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. The date, time and venue of pre-

bid meeting, if convened, is as stipulated in the BDS. All prospective bidders or their authorized representatives shall be invited to attend such a pre-bid meeting.

17.2 The bidders are requested to submit questions, if any, in writing so as to reach the Employer not later than seven (7) days before the proposed pre-bid meeting.

17.3 Minutes of the pre-bid meeting, including the text of the questions raised and the replies given, will be transmitted without delay to all the prospective Bidders who purchased the Bidding Documents. Any modification of the Bidding Documents listed in Sub-Clause 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.9 and not through the minutes of the pre-bid meeting.

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

IB.18 Format and Signing of Bid

18.1 Bidders are particularly directed that the amount entered on the Form of Bid shall be for performing the Contract strictly in accordance with the Bidding Documents.

18.2 All appendices to Bid are to be properly completed and signed.

18.3 No alteration is to be made in the Form of Bid nor in the Appendices thereto except in filling up the blanks as directed. If any such alterations be made or if these instructions be not fully complied with, the bid may be rejected.

18.4 Each bidder shall prepare by filling out the forms completely and without alterations one (1) original and number of copies, specified in the BDS, of the documents comprising the bid as described in Clause IB.7 and clearly mark them “ORIGINAL” and ‘COPY” as appropriate. In the event of discrepancy between them, the original shall prevail.

18.5 The original and all copies of the bid shall be typed or written in indelible ink (in the case of copies, Photostats are also acceptable) and shall be signed by a person or persons duly authorized to sign on behalf of the bidder pursuant to Sub- Clause IB 11.1(c) hereof. All pages of the bid shall be initialed and stamped by the person or persons signing the bid.

18.6 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.

18.7 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.

18.8 Bidders should retain a copy of the Bidding Documents as their file copy.

D. SUBMISSION OF BIDS

IB.19 Sealing and Marking of Bids

19.1 Each bidder shall submit his bid as under:

(a) ORIGINAL and each copy of the Bid shall be separately sealed and put in separate envelopes and marked as such.

(b) The envelopes containing the ORIGINAL and copies will be put in one sealed envelope and addressed / identified as given in Sub- Clause 19.2 hereof.

19.2 The inner and outer envelopes shall:

(a) be addressed to the Employer at the address provided in the BDS;

(b) bear the name and identification number of the contract as defined in the BDS; and

(c) provide a warning not to open before the time and date for bid opening, as specified in the BDS.

19.3 In addition to the identification required in Sub-Clause 19.2 hereof, the inner envelope shall indicate the name and address of the bidder to enable the bid to be returned unopened in case it is declared “late” pursuant to Clause IB.21

19.4 If the outer envelope is not sealed and marked as above, the Employer will assume no responsibility for the misplacement or premature opening of the Bid.

IB.20 Deadline for Submission of Bids

20.1 (a) Bids must be received by the Employer at the address specified no later than the time and date stipulated in the BDS.

(b) Bids with charges payable will not be accepted, nor will arrangements be undertaken to collect the bids from any delivery point other than that specified above. Bidders shall bear all expenses incurred in the preparation and delivery of bids. No claims will be entertained for refund of such expenses.

(c) Where delivery of a bid is by mail and the bidder wishes to receive an acknowledgment of receipt of such bid, he shall make a request for such acknowledgment in a separate letter attached to but not included in the sealed bid package.

(d) Upon request, acknowledgment of receipt of bids will be provided to those making delivery in person or by messenger.

20.2 The Employer may, at his discretion, extend the deadline for submission of bids by issuing an amendment in accordance with Clause IB.9, 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.21 Late Bids

21.1 (a) Any bid received by the Employer after the deadline for submission of bids prescribed in Clause IB.20 will be returned unopened to such bidder.

(b) Delays in the mail, delays of person in transit, or delivery of a bid to the wrong office shall not be accepted as an excuse for failure to deliver a bid at the proper place and time. It shall be the bidder's responsibility to determine the manner in which timely delivery of his bid will be accomplished either in person, by messenger or by mail.

IB.22 Modification, Substitution and Withdrawal of Bids

22.1 Any bidder may modify, substitute or withdraw his bid after bid submission provided that the modification, substitution or written notice of withdrawal is received by the Employer prior to the deadline for submission of bids.

22.2 The modification, substitution, or notice for withdrawal of any bid shall be prepared, sealed, marked and delivered in accordance with the provisions of

Clause IB.19 with the outer and inner envelopes additionally marked "MODIFICATION", "SUBSTITUTION" or "WITHDRAWAL" as appropriate.

22.3 No bid may be modified by a bidder after the deadline for submission of bids except in accordance with Sub-Clauses 22.1 and 27.2.

22.4 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 in pursuance to Clause IB.15.

E. BID OPENING AND EVALUATION

IB.23 Bid Opening

23.1 The Employer will open the bids, including withdrawals, substitution and modifications made pursuant to Clause IB.22, in the presence of bidders' representatives who choose to attend, at the time, date and location stipulated in the BDS. The bidders' representatives who are present shall sign a register evidencing their attendance.

23.2 Envelopes marked "MODIFICATION", "SUBSTITUTION" or "WITHDRAWAL" shall be opened and read out first. Bids for which an acceptable notice of withdrawal has been submitted pursuant to Clause IB.22 shall not be opened.

23.3 The bidder's name, total Bid Price and price of any Alternate Proposal(s), any discounts, bid modifications**,** substitution and withdrawals, the presence or absence of Bid Security, and such other details as the Employer may consider appropriate, will be announced by the Employer at the opening of bids.

23.4 Employer shall prepare minutes of the bid opening, including the information disclosed to those present in accordance with the Sub-Clause 23.3.

IB.24 Process to be Confidential

24.1 Information relating to the examination, clarification, evaluation and comparison of bid and recommendations for the award of a contract shall not be disclosed to bidders or any other person not officially concerned with such process before the announcement of bid evaluation report which shall be announced at least ten (10) days prior to issuance of Letter of Acceptance. 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. Any effort by a bidder to influence the Employer's processing of bids or award decisions may result in the

rejection of such bidder's bid. Whereas any bidder feeling aggrieved may lodge a written complaint not later than fifteen (15) days after the announcement of the bid evaluation report; however mere fact of lodging a complaint shall not warrant suspension of the procurement process.

IB.25 Clarification of Bids

25.1 To assist in the examination, evaluation and comparison of bids, the Employer may, at his discretion, ask any bidder for clarification of his bid, including breakdowns of unit rates. The request for clarification and the response shall be in writing but no change in the price or substance of the bid shall be sought, offered or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the bids in accordance with Clause IB.28.

IB.26 Examination of Bids and Determination of Responsiveness

26.1 Prior to the Evaluation and Comparison of Bids under Clause IB 28, the Employer will determine whether each bid is substantially responsive to the requirements of the Bidding Documents.

26.2 A substantially responsive bid is one which (i) meets the eligibility criteria; (ii) has been properly signed; (iii) is accompanied by the required Bid Security; and (iv) conforms to all the terms, conditions and specifications of the Bidding Documents, without material deviation or reservation. A material deviation or reservation 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) adoption/rectification whereof would affect unfairly the competitive position of other bidders presenting substantially responsive bids.

26.3 If a bid is not substantially responsive, it will be rejected by the Employer, and may not subsequently be made responsive by correction or withdrawal of the non-conforming deviation or reservation.

IB.27 Correction of Errors

27.1 Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors. The Employer will correct the errors as follows:

(a) where there is a discrepancy between the amounts in figures and in words, the amount in words will govern; and

(b) where there is a discrepancy between the unit rate and the line-item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern, 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.

27.2 The amount stated in the Form of Bid will be adjusted by the Employer in accordance with the above procedure for the correction of errors and with the concurrence of the bidder, shall be considered as binding upon the bidder. If the bidder does not accept the corrected Bid Price, his Bid will be rejected, and the Bid Security shall be forfeited in accordance with Sub- Clause IB 15.6(b) hereof.

IB.28 Evaluation and Comparison of Bids

28.1 The Employer will evaluate and compare only the Bids determined to be substantially responsive in accordance with Clause IB.26.

28.2 In evaluating the Bids, the Employer will determine for each Bid the evaluated Bid Price by adjusting the Bid Price as follows:

(a) making any correction for errors pursuant to Clause IB.27;
(b) excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill of Quantities, but including competitively priced Daywork; and
(c) making an appropriate adjustment for any other acceptable variation or deviation.

28.3 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.

28.4 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 analyses for any or all items of the Bill of Quantities 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.32 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.

F. AWARD OF CONTRACT

IB.29 Award

29.1 Subject to Clauses IB.30 and IB.34, 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 eligible in accordance with the provisions of Clause IB.3 and qualify pursuant to Sub-Clause IB 29.2.

29.2 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 therefor in writing. They shall form part of the records of that bid evaluation report.

IB.30 Employer's Right to Accept any Bid and to Reject any or all Bids

30.1 Notwithstanding Clause IB.29, 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 except that the grounds for rejection of all bids 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.

IB.31 Notification of Award

31.1 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").

31.2 No Negotiation with the bidder having evaluated as lowest responsive or any other bidder shall be permitted, however, Employer may have clarification meetings to get clarify any item in the bid evaluation report.

31.3 The notification of award 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.

31.4 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.32 Performance Security

32.1 The successful bidder shall furnish to the Employer a Performance Security in the form and the amount stipulated in the BDS and the Conditions of Contract within a period of 28 days after the receipt of Letter of Acceptance.

32.2 Failure of the successful bidder to comply with the requirements of Sub-Clause IB.32.1 or Clauses IB.33 or IB.35 shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security.

IB.33 Signing of Contract Agreement

33.1 Within 14 days from the date of furnishing of acceptable Performance Security under the Conditions of Contract, the Employer will send the successful bidder the Contract Agreement in the form provided in the Bidding Documents, incorporating all agreements between the parties.

33.2 The formal Agreement between the Employer and the successful bidder shall be executed within 14 days of the receipt of the Contract Agreement by the successful bidder from the Employer.

IB.34 General Performance of the Bidders

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, interalia, reject his bid and/or refer the case to the Pakistan Engineering Council (PEC). 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.35 Integrity Pact and ADB Integrity Covenant

The Bidder shall sign and stamp the Integrity Pact provided at Appendix-O to Bid in the Bidding Documents for all Federal Government procurement contracts exceeding Rupees ten million. The Bidder shall also sign and stamp the ADB Integrity Covenant provided at Appendix O to Bid in the Bidding Documents. Failure to provide such Integrity Pact and ADB Integrity Covenant shall make the bidder non-responsive.

IB.36 Instructions not Part of Contract

Bids shall be prepared and submitted in accordance with these Instructions which are provided to assist bidders in preparing their bids, and do not constitute part of the Bid or the Contract Documents.

Section II
Bid Data Sheet

The following specific data for the Works to be bided shall complement, amend, or supplement the provisions in the Instructions to Bidders. Wherever there is a conflict, the provisions herein shall prevail over those in the Instructions to Bidders.

IB 1.1	Name and address of the Employer: Name: National Grid Company of Pakistan (NGC) (Formerly NTDC) Represented by: **Chief Engineer (MP&M) NGC** Address: 8th Floor, Shaheen Complex, Egerton Road, Lahore-Pakistan. Telephone No. 92-42-99202597; Fax No. +92-42-99202173 E-mail address: cempm@ntdc.com.pk
IB 1.1	The bidding is open to ***National Competitive Bidding (NCB)***
IB 1.1	The name of the NCB is: **"Construction and completion of Civil Works, Erection, Stringing, Testing & Commissioning of 500kV D/C Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station using ACSR "Bunting" Conductor, Lot-I: 500kV Double Circuit Quad Bundle Transmission Line from Tower No. 01 Near Sangal to Tower No. 69 Near Potha Sharif (23.5 km)"** (Detail of work as per Price Schedule & Scope of work) The identification number of the NCB is: **TLC-18(R)-2026** The scope of work is as follows: **Construction and completion of Civil Works, Erection, Stringing, Testing & Commissioning of 500kV D/C Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station using ACSR "Bunting" Conductor** **Lot-I:** 500kV Double Circuit Quad Bundle Transmission Line from Tower No. 01 Near Sangal to Tower No. 69 Near Potha Sharif (23.5 km)
IB 2.1	Source of Funding: NGC own Resources
IB 3.1 (a)	The existing sub clause 3.1(a) is deleted and replaced with following: The Invitation for Bids is open to all bidders in their sole capacity or as joint venture meeting the following requirements: i) The Bidder (Sole firm or all Partners of JV) shall have nationality of Pakistan as defined in Pakistan Engineering Council (PEC) Construction and Operation of Engineering Works Bye Laws. ii) The Sole Bidder shall be duly licensed by the Pakistan Engineering Council (PEC) as a Pakistani Constructor minimum in the relevant category (depending upon the value of proposed award) or had applied for renewal of license before submission of its

	bid. In case of Joint Venture Bidder, all the partners shall be duly licensed by PEC and the sum total of the limit of construction cost permitted by the categories of the individual licensees shall not be less than limit of construction cost permitted by the category required here above. iii) Constructor shall be on Active Taxpayers List of the Federal Board of Revenue and relevant Provincial Revenue Authority. iv) 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 for Blacklisting of Contractors (copy of policy attached with the bidding documents). Non-submission of this undertaking may result in the rejection of the bid. The undertaking will subsequently become part of the Contract Agreement as well [Note: *NGC's SOP for blacklisting of Contractors is included in this document for information as to general mechanism. However, this will be strictly interpreted to the extent of the mechanism defined in PPRA Rules 2004 (revised 2021) and IB 38 of Section-II (BDS) of this document.*] v) 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
IB 3.1(b)	Delete IB 3.1(b) and replace it with the following. **Qualification of the Bidder** To be qualified for award of a contract, the Bidder shall meet the qualification criteria delineated herein below: **1. <u>Construction Experience:</u>** **A. <u>For Transmission Lines:</u>** i) The bidder as a main contractor (as single entity or as JV partner or approved subcontractor) must have substantially completed construction contract(s) comprising of detailed survey, sub-soil investigations, construction of tower conventional foundations, erection of towers, stringing, testing & commissioning of following: • One (1) 500kV or higher voltage or three (3) 220kV or higher bundled transmission lines of at least **11.75km** strung by controlled tension method during last ten (10) years.

*If the Bidder has executed these contract(s) as a JV partner, he shall have carried out all the activities mentioned here before.

* For purpose of this clause, the experience shall be evidenced through Completion Certificates/Taking over Certificates etc. showing substantial completion of works.

ii) Such transmission lines must have been operating successfully for at least two (02) years prior to deadline for submission of bids.

iii) In case the bid is submitted by a joint venture under this bidding process, lead partners shall meet the above experience criteria.

iv) Each JV partner other than the lead partner must have completed as a main contractor, JV partner or approved sub-contractor construction contract(s) comprising of detailed survey, sub-soil investigations, construction of tower conventional foundations, erection of towers, stringing, testing & commissioning of 220kV or higher voltage bundled transmission lines of at least **5.875km** strung by controlled tension method during last ten (10) years.

v) The Bidder shall submit with the Bid evidence in this regard including inter alia copies (with English translation) of the contract agreement(s), substantial completion certificate(s) and Defects Liability Certificate, duly notarized, for the contract(s).

vi) The bidder shall have his own tension / stringing equipment along with associated T&P and critical equipment as per requirement of the project duly supported with documentary evidence/catalogues/drawings for undertaking such like works in good working condition. Alternatively, if not so, the bidder will identify the confirmed source of the said machinery, T&P etc. along with documentary evidence/catalogues/drawings and shall provide necessary guarantee/surety that he will arrange the said equipment in good working condition through its own resources prior to start of stringing activity. The aforementioned documentary evidence shall be submitted with the bid.

vii) **Special Criteria**
The bidder or his proposed subcontractor shall have experience of normal piling or piling in river crossing during the last (05) five years.

2. Key Personnel:

The Bidder shall have the personnel for the key positions to be deployed for meeting the following requirements: (Information to be submitted in Appendix-G to Bid given in Section-III of the Bidding Documents).

Positions	Relevant Construction Experience	No. of Personnel

Project Manager	10	01
Electrical Engineers	07	03
Civil Engineers	07	03
EnvironmentExpert	05	01
Social Safeguard Expert	05	01

The above personnel shall be graduate engineers or equivalent*.

** Note: The rejection of key personnel shall not result in rejection of the Bid, however, bidder shall undertake to replace the key personnel with the acceptable to the Employer in case of award of contract.*

3. Bidder's Financial Capability:

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

i. The audited Financial "Standalone" Statements (Balance Sheet along with Notes, Profit & Loss Accounts and Cash Flow Statement) audited by Chartered Accountant for the last five (05) years shall be submitted by the Bidder. The Bidder's Financial Statements for the last One year of the audited accounts should show that it has positive "NET WORTH" calculated as a difference between total assets and total liabilities (Information to be submitted in prescribed Form QF-5 of Appendix-N to Bid given in Section-III of the Bidding Documents). In case of JV, each JV partner shall meet the aforementioned criteria.

ii. Minimum average annual turnover requirement lot-wise is as under:

Lot I: 1,575 Million PKR

Minimum average annual turnover is 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.
(Information to be submitted in prescribed Form QF-6 of Appendix-N to Bid given in Section-III of the Bidding Documents).

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

iii. The Bidder must demonstrate access to, or availability of, financial resources such as liquid assets, lines of credit (issued specifically for the project), and other financial means to meet the total cash flow demands of this contract

which is being considered equal to the following lot-wise requirements:

Lot I: 780 Million PKR plus 25% of the Bidder's commitments for running contracts.

(Information to be submitted in prescribed Form QF-7 of Appendix-P to Bid given in Section-III of the Bidding Documents).

Notes:

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

  The Bidder shall provide his current work commitments in form QF-4 of Appendix-P to Bid given in Section-III 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.]

- The bidder shall provide bank certificate for his lines of credit on the prescribed Form QF-8 of Appendix-P to Bid given in Section-III of the Bidding Documents.

4. Bidder's Litigation History

Bidders are required to submit details of all litigation, arbitration and other claims whether pending, threatened or resolved in the last five years. The Employer may disqualify bidder in the event that the total amount of pending or threatened litigation, arbitration or other claims represents fifty percent (50%) of the Bidder's net worth. Details in this regard should be submitted in the prescribed Form QF-9 given in Appendix-P of Section-III of Bidding Document.

Construction Experience of subsidiaries or parent/sister/affiliate companies shall not be considered for qualification of the Bidder.

The Qualification of the Bidders will be based on meeting the pass/fail criteria as demonstrated by the Bidders' responses in the respective Appendices.

The above stated requirements are the minimum and the Employer reserves the right to request for any additional information. The Employer also reserves the right to reject the proposal of any Bidder, if in the opinion of the Employer the qualification

	details are incomplete, ambiguous or the Bidder is found not qualified to satisfactorily perform the Contract. The above stated Appendices should be completed as per prescribed format and submitted along with required attachments. The missing or incomplete information/documents may render the bid substantially non-responsive. In this regard, the Employer does not have an obligation to request any document/certificates. **5.** Bidder is not subject to Asian Development Bank's debarment and temporary suspension The Bidder will not be eligible to participate in the procurement of the Contract while under temporary suspension or debarment by the Asian Development Ban ("ADB") pursuant to its Anticorruption Policy (see Appendix O), whether such debarment was directly imposed by ADB, or enforced by ADB pursuant to the Agreement for Mutual Enforcement of Debarment Decisions. A bid from a temporarily suspended or debarred firm will be rejected and such bid may be in breach of debarment conditions, thereby subject to further ADB's investigation. **6.** Bidder is not subject to sanctions decisions by United Nations Security Council Bidders 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, the Employer's country prohibits any import of goods from, or payments to, a particular country, person, or entity in respect of goods or services originating in that country. Where the Employer's country prohibits payments to a particular person or entity or for particular goods or services by such an act of compliance, that firm shall be excluded.
IB 3.2	The following sub clause is added after 3.1: A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to be in a conflict of interest with one or more parties in this bidding process if, including but not limited to: (i) they have controlling shareholders in common; or (ii) they receive or have received any direct or indirect subsidy from any of them; or (iii) they have the same legal representative for purposes of this bid; or (iv) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to material information about or improperly influence the bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or (v) A Bidder or any affiliated entity, participated as a consultant in the preparation of the design or technical specifications of the plant and

	services that are the subject of the bid. (vi) a Bidder was affiliated with a firm or entity that has been hired (or is proposed to be hired) by the Employer or Employer's country as Engineer for the Contract; or (vii) a Bidder would be providing goods, works, or nonconsulting services resulting from or directly related to consulting services for the preparation or implementation of the project specified in the IB 19.2(b) that it provided, or were provided by any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm; or (viii) A Bidder that has a financial or familial relationship with Employer's personnel including personnel of project implementing/executing agency who: (i) are directly or indirectly involved in the preparation of the bidding documents or specifications of the Contract, and/or the bid evaluation process of such Contract; or (ii) would be involved in the implementation or supervision of such Contract unless the conflict stemming from such relationship has been resolved in a manner acceptable to the Employer throughout the procurement process and execution of the contract.
IB 6.1	Sub-Clause IB 6.1 is deleted and replaced with the following: The Bidder, at its own expense, shall inspect the site, examine and obtain all information required and satisfy himself regarding matters and things such as access to site, communication, transport, right of way, the type and number of equipment and facilities required for the satisfactory completion of work, the quantity of various sections of the work, the availability of local labor, availability and rates of materials, local working conditions, uncertainties of weather, obstructions and hindrances that may arise etc., which may affect the work or cost thereof, before submission of his bid. Ignorance of site conditions shall not be accepted by the Employer as basis for any claim for compensation. The submission of a bid by the bidder will be construed as evidence that such an examination was made and any later claims/disputes in regard to rates quoted shall not be entertained or considered by the Employer.
IB 7.2	The following text is added at the start of Sub-Clause IB 7.2: The Bidders should ensure that they have received the Bidding Documents including Addenda (if any) complete in all respects. The Employer accepts no responsibility for any Bidder lacking a complete set of Bidding Documents including Addenda (if any). The complete Bidding Document including Addenda (if any) will also be available on Employer's website i.e. www.ntdc.com.pk.
IB 8.1	The Sub-Clause 8.1 is amended to the following extent: 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 Employer's response will be made not later than 7 days prior to the date fixed for submission of Bids. Further, the mere request for clarification from the bidders shall not be a ground for

	seeking extension in the deadline for submission of Bids.
IB 10.1	The bid with all accompanying documents and all communications in relation to or concerning the bidding Process shall be in **English** language and strictly on the forms provided in the bidding Documents. In case any of these Documents is in another language, it must be accompanied by an accurate translation of the relevant passages in English, in which case, for all purposes of interpretation of the bid, the translation in English shall prevail. Any portions of Bids that are not in English may not be evaluated. Failure to comply with this may disqualify a bid.
IB 11.1	**Documents Comprising the Bid** Delete the text of this Sub-Clause and substitute with the following: The Bid submitted by the Bidder shall be prepared in two (02) separate envelopes, one containing the "Technical Bid" and the other containing "Price Bid" comprising the following documents in the respective envelope: **I. Technical Bid** a) Duly filled-in Form of Technical Bid with following Appendices to Bid: i) Appendix-A to Bid — Special Stipulations ii) Appendix-C to Bid — Price Adjustment (under Clause 70) iii) Appendix-E to Bid — Proposed Construction Schedule iv) Appendix-F to Bid — Method of Performing the Work v) Appendix-G to Bid — Personnel vi) Appendix-H to Bid — Equipment vii) Appendix-I to Bid — Construction Camp and Housing Facilities viii) Appendix-J to Bid — Organizational Chart for the Supervisory Staff and Labor ix) Appendix-K to Bid — List of Sub-Contractors x) Appendix-L to Bid — Source of Materials xi) Appendix-N to Bid — Deviations xii) Appendix-O to Bid — Integrity Pact and ADB Integrity Covenant xiii) Appendix-P to Bid — Bidder's Qualification Forms b) Bid Security as per requirements specified in Section-I Clause IB 15. c) Written Power of Attorney, duly notarized, authorizing the signatory of the bid to act for and on behalf of the Bidder; d) Copies of Original Documents defining the constitution or legal status, place of registration and principal place of business of the bidder and JV partners; e) An affidavit that the Bidder has not been blacklisted pursuant to Sub-Clause IB 3.1(a) (iv);

	f) An Affidavit that the Bidder has read and accepts NGC's SOP for blacklisting of Contractors pursuant to Sub-Clause IB 3.1(iv) & ITB 38 of Bid Data Sheet of this document. g) Proof of purchase of Bidding Documents from the Employer; h) Beneficial Ownership Declaration Performa dully filled by the Bidder as per S.R.O 592(I)/2022 available at https://www.ppra.org.pk/doc/sro592.pdf. i) PEC license pursuant to Sub-Clause 3.1(i); and j) Electronic/Soft copy of complete Technical Bid in CD/DVD/USB/Pen Drive (dully protected as READ ONLY/End to End Encrypted) containing an electronic version of the Bid in PDF format scanned from the original bid. This should be enclosed in the sealed envelope containing the Original Bid. *In case of a discrepancy, the hard copy shall prevail. The soft copy shall not be considered as a replacement of hard copy.* k) Any other document required to be submitted in accordance with these Bidding Documents. l) Proof of tax compliance pursuant to Sub-Clause IB 3.1(a)(ii). **II. Price Bid** a) Duly filled-in Form of Price Bid with following Appendices to Bid: i) Appendix-B to Bid Foreign Currency Requirements (Not Used) ii) Appendix-D to Bid Bill of Quantities iii) Appendix-M to Bid Estimated Progress Payments b) Further, Electronic/Soft copy of complete Financial Bid in USB/Pen Drive containing an electronic version (READ ONLY/END TO END ENCRYPTED MODE ONLY) of the Bid in PDF/Excel format. This should be enclosed in the sealed envelope containing the Original Bid. However, this shall not be treated equivalent to hard copy and is only for purpose of convenience in evaluation. The submission of hard copy remains mandatory. c) Any other document required to be submitted in accordance with these Bidding Documents.
IB 11.2	Following is added at the end of Sub-Clause IB.11.2: "(f) The maximum J.V. partners shall not be more than three (03)."
IB 12.5	Add the following new Sub-Clause IB 12.5: The prices and bid evaluation should be without PST (Note: - There is no need to give separate column or line item for this purpose in BoQ / Price Schedule).

IB 12.6	Add the following new Sub-Clause IB 12.6: The cost of the material for this transmission line would be the following to calculate the insurance charges: Lot-I: 7,792 Million PKR
IB 13	Clause IB.13 is substituted with the following: "The Bidder shall quote the unit rates and prices entirely in Pak Rupees. All payments under the contract shall be made in Pak Rupees only. Bidders expecting to incur expenditures in currency(ies) other than Pak Rupees shall manage foreign currency(ies) at their own arrangement. The exchange risk in this regard, if any, shall be deemed to be included in unit rates and prices quoted by the Bidder."
IB 14.1	The period for Bid validity shall be minimum 150 days after the date of Bid opening.
IB 15.1	The amount of Bid Security shall be the following: Lot-I: PKR 63 million or an equivalent amount
IB 15.2	Sub-Clause IB.15.2 is substituted with the following: "The Bid Security shall be, at the option of the Bidder, in the form of Deposit at Call or a Bank 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 on the prescribed Form annexed to these Documents valid for a period 28 days beyond the Bid Validity date. The Bid Security of Joint Venture shall be in the name of Joint Venture submitting the Bid. 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 1st written notice from Bank in Pakistan]* shall not be acceptable and the Bid is rejected as non-responsive." *[Any mode for submission of bid security apart from aforementioned like Swift Code or Crossed Cheque shall not be acceptable]* If a bidder submits a Bid Security that has following discrepancies (to the extent mentioned against each), the Employer shall request the Bidder to submit a complaint bid security within fourteen (14) days of receiving such request. Failure to provide a complaint 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: 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.
IB 15.6	The following is added at the end of Sub-Clause IB.15.6: "(d) If the Bidder is found involved in corrupt and fraudulent practices."

IB 16	Text of Clause IB 16 is deleted and replaced with following text: "Alternate Proposal is not applicable."
IB 17.1	Pre-bid meeting will be held as per the following schedule: Date: ***June xx, 2026*** Time: ***11:00 am*** Venue: **Office of Chief Engineer (MP&M) NGC** 8th Floor, Shaheen Complex, Egerton Road, Lahore-Pakistan. Telephone No. 92-42-99202597; Fax No. +92-42-99202173 E-mail address: cempm@ntdc.com.pk
IB 18.4	Sub-Clause 18.4 is substituted with the following: "Each Bidder shall prepare by filling out the forms completely and without alterations one original set of the Technical Bid and one original set of the Price Bid as described in IB. 11 and clearly mark each "ORIGINAL - TECHNICAL BID" and "ORIGINAL - PRICE BID". In addition, the Bidder shall submit two (02) copies each of the Technical Bid and the Price Bid, clearly marked as "COPY NO… - TECHNICAL BID" and "COPY NO…. - PRICE BID". In the event of any discrepancy between the original and the copies, the original shall prevail. The Bidder shall also submit an electronic copy of BOQ on Pen Drive in MS Office (Excel) format and shall enclose in the Price Bid envelope."
IB.19.1	Sub-Clause 19.1 is substituted by the following: "The Technical Bid and Price Bid (comprising the relevant documents as stated under Sub-Clause IB.11) shall be prepared separately. The ORIGINAL and each COPY of Technical Bid shall be sealed in one envelope marked as such. Similarly, the ORIGINAL and each COPY of the Price Bid shall be sealed in another envelope and marked as such. Price Bid of each Lot shall be sealed in a separate envelope. The outer envelope comprising both 'Technical Bid' and 'Price Bid' shall be addressed/identified as given in Sub-Clause 19.2 hereof."
IB 19.2 (a)	Employer's address for the purpose of Bid submission: **Chief Engineer (MP&M) NGC** 8th Floor, Shaheen Complex, Egerton Road, Lahore-Pakistan. Telephone No. 92-42-99202597; Fax No. +92-42-99202173 E-mail address: cempm@ntdc.com.pk
IB 19.2 (b)	**Name of the Project:** **Construction and completion of Civil Works, Erection, Stringing, Testing & Commissioning of 500kV D/C Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station using ACSR "Bunting" Conductor** **Lot-I:** 500kV Double Circuit Quad Bundle Transmission Line from Tower No. 01 Near Sangal to Tower No. 69 Near Potha Sharif (23.5 km) **Identification No.: TLC-18(R)-2026**

IB 19.2 (c)	Para (c) of Sub-Clause 19.2 is substituted by the following: The outer envelopes and the inner envelopes containing the Technical Bid shall bear a warning not to open before the time and date for the opening of Technical Bids, in accordance with IB 23.1. The envelopes containing the Price Bid shall bear a warning not to open until advised by the Employer in accordance with IB 23.2.
IB 20.1 (a)	Deadline for Submission of bid: Date: **July xx, 2026** Time: **11:00 am**
IB 20.1 (c)	Following text is added at the start of Sub-Clause IB 20(c). The delivery of the bid will be in person, by messenger and/or through mail/courier only. *Notes to the Bidders: Any delivery through express mail/courier shall be made with proper subject of the tender being submitted and the intent of communication and shall be properly sealed/packed. NGC will not be responsible for any late submittals or opening of bids on account of improper/missing markings on top of package*
IB 20.1 (e)	Add the following new Para (e) at the end of Sub-Clause IB 20.1(d): "(e) Bids submitted through fax or email shall not be considered."
IB.23 23.1	**Bid Opening:** Sub-Clause IB.23.1 is substituted by the following: The Employer shall open the Technical Bids in public at the address, on the date, and time specified herein in the presence of Bidder's designated representatives who choose to attend. The Bidders' representatives who are present shall sign a register evidencing their attendance. Date: **July xx, 2026** Time: **11:30 am** Address: **Office of Chief Engineer (MP&M) NGC** 8th Floor, Shaheen Complex, Egerton Road, Lahore-Pakistan
23.2	Sub-Clause IB.23.2 is substituted by the following: The Price Bids will remain unopened and will be held in custody of the Employer until the time of opening of the Price Bids. The date, time, and location of the opening of Price Bids will be advised in writing by the Employer. If the Price Bid is submitted unsealed or found unsealed inside the envelope of Technical Bid, the Employer shall reject the entire Bid and record at the time of opening of the Technical Bids.
23.3	Sub-Clause IB.23.3 is substituted by the following: First, envelopes marked "WITHDRAWAL" shall be opened, read out, and recorded, and the envelope containing the corresponding bid shall not be opened, but returned to the Bidder. No bid withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out and recorded at

	bid opening.
23.4	Sub-Clause IB.23.4 is substituted by the following: Next, outer envelopes marked "SUBSTITUTION" shall be opened. The inner envelopes containing the Substitution Technical Bid and/or Substitution Price Bid shall be exchanged for the corresponding envelopes being substituted, which are to be returned to the Bidder unopened. Only the Substitution Technical Bid, if any, shall be opened, read out, and recorded. Substitution Price Bid will remain unopened in accordance with IB 23.2. No envelope shall be substituted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out and recorded at bid opening.
23.5	Sub-Clause IB.23.5 is inserted as follows: Next, outer envelopes marked "MODIFICATION" shall be opened. No Technical Bid and/or Price Bid shall be modified unless the corresponding modification notice contains a valid authorization to request the modification and is read out and recorded at the opening of Technical Bids. Only the Technical Bids, both Original as well as Modification are to be opened, read out, and recorded at the opening. Price Bids, both Original as well as Modification, will remain unopened in accordance with IB 23.2.
23.6	Sub-Clause IB.23.6 is inserted as follows: All other envelopes holding the Technical Bids, except the Bids rejected pursuant to Sub-Clause IB.23.2, shall be opened one at a time, and the following read out and recorded (a) the name of the Bidder; (b) whether there is a modification or substitution; (c) Bid Security particulars (d) any other details as the Employer may consider appropriate. Only Technical Bids and alternative Technical Bids (if allowed under Sub-Clause IB.16 hereof) read out and recorded at bid opening shall be considered for evaluation. Unless otherwise specified in the BDS, the Form of Technical Bid is to be initialed by the nominated representatives of the Employer attending the bid opening. No Bid shall be rejected at the opening of Technical Bids except for late bids, in accordance with IB.21.1.
23.7	Sub-Clause IB.23.7 is inserted as follows: The Employer shall prepare a record of the opening of Technical Bids that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, modification, or alternative offer; and the particulars of Bid Security. A copy of the record shall be distributed to all Bidders.
23.8	Sub-Clause IB.23.8 is inserted as follows: 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.

23.9	Sub-Clause IB.23.9 is inserted as follows: The Employer will notify Bidders in writing who have been rejected on the grounds of being substantially nonresponsive to the requirements of the Bidding Documents and return their Price Bids unopened.
23.10	Sub-Clause IB.23.10 is inserted as follows: 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.
23.11	Sub-Clause IB.23.11 is inserted as follows: - All envelopes containing Price Bids shall be opened one at a time and the following read out and recorded (a) the name of the Bidder; (b) whether there is a modification or substitution; (c) the Bid Prices, including any discounts, cross discounts and alternative offers; (d) the presence of Bid Security; and (e) any other details as the Employer may consider appropriate. Only Price Bids, discounts, cross discounts and alternative offers (if allowed under Sub-Clause IB.16 hereof) read out and recorded during the opening of Price Bids shall be considered for evaluation. Unless otherwise specified in the Bidding Data, the Form of Price Bid and Price Schedules are to be initialed by nominated representatives of the Employer attending the bid opening.
23.12	Sub-Clause IB.23.12 is inserted as follows: - 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 (per lot if applicable), any discounts, cross discounts, any alternative offers etc. A copy of the record shall be distributed to all Bidders present at the time of Bid opening.
IB 24.2	Add the following new Sub-Clause after IB 24.1: Bidders and their respective agents, suppliers, sub-contractors, representatives and anyone else on behalf of the bidder will not communicate or attempt to communicate directly or indirectly with the Employer, including any employees, directors, officers, agents or representatives of any of them during any part of the Competitive Bidding Process, except as expressly directed or permitted by the Employer. Bidders will also not engage in any form of political or other lobbying whatsoever with respect to their Bids, or otherwise attempt to influence the outcome of the Competitive Bidding Process. In the event of any such communications or lobbying, Employer may at any time reject any Bid by that Bidder without further consideration.

IB 25.1	Add the following at the end of Sub-Clause 25.1: The Employer may, at his discretion, ask any Bidder for confirmation/submission of missing information to clarify its Bid. However, the Employer does not have an obligation to request any additional information or clarification with respect to missing or deficient information in a Bid. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered.
IB 25.2	Add the following new Sub-Clause: 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 26.1	Sub-Clause 26.1 is substituted by the following: "The Employer will determine whether Bid is substantially responsive to the requirements of the Bidding Documents."
IB 26.2	Sub-Clause 26.2 is substituted by the following: "A substantially responsive Technical Bid is one which (i) meets the eligibility criteria; (ii) has been properly signed; (iii) meets the qualification criteria delineated at Sub-Clause IB.3A hereof; and (iv) conforms to all the terms, conditions and specifications of the Bidding Documents, without material deviation or reservation. A substantially responsive Price Bid is one which (i) has been properly signed; (ii) is accompanied by the required Bid Security; and (iii) conforms to all the terms, conditions and specifications of the Bidding Documents, without material deviation or reservation. A material deviation or reservation 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) adoption/rectification whereof would affect unfairly the competitive position of other Bidders presenting substantially responsive bids. Any minor informality or non-conformity or irregularity in a Bid which does not constitute a material deviation may be waived by the Employer, provided such waiver does not prejudice or affect the relative ranking of any Bidder."
IB 26.4	Following Sub-Clauses are added at the end of Sub-Clause 26.3: The Employer may reject any Bid as non-responsive if found materially incomplete, obscure, irregular or omits any material information required to be submitted by the Bidding Documents.

IB 27.3	Following Sub Clause is added after Sub Clause 27.2: If as a result of arithmetic correction, the Bid Price is increased substantially, the Bidder may be asked to increase the amount of its Bid Security accordingly by submitting its amendment within fifteen (15) days from issuing date of such notification. If the Bidder fails to provide the requisite amendment of the Bid Security within the stipulated period, his Bid will be held substantially non-responsive and will be rejected.
IB 28.1	In case of Lots only Following Para is added at the end of the Sub-Clause 28.1: "The Works will be evaluated and compared on Lot basis."
IB 28.2	In case of Lots only Following Para is added after the Para (c) of IB. 28.2: (d) applying cross discount in case of combination of Lots to arrive at least cost combination
IB 28.4	Following is added at the end of Sub-clause IB 28.4: "or the employer may require the successful Bidder to balance his bid." In case of front-end loading or unbalanced price of any BoQ item, the Employer reserve the right to adjust the price with other BoQ items provided that ceiling of overall price remains the same.
IB 28.5	Following new Sub Clause is added after IB 28.4: The Employer will evaluate the Bids, including all clarifications, additional information, modifications and negotiated changes, by applying the Eligibility and Qualification Criteria. 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 of 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. The Employer may independently verify any information (including conducting credit, reference and other checks with respect to a Bidder) and consider such findings in its evaluation. Employer is not required to inform Bidders of how Bids were ranked in the evaluation process.
IB 28.6	Add the following new Sub-Clause IB 12.5: The Employer's evaluation of a Bid will exclude and not take into account Provincial Sales Tax (PST).

IB 29.2	Following text is added at the end of Sub Clause 29.2 The Employer reserves the right to assess the capacity and capability of the Bidder, to successfully execute the scope of work covered under the Bidding Documents within stipulated completion period. This assessment may inter-alia include for (i) document verification; (ii) details of work executed, work in hand, anticipated in future; (iii) details of tools & plant; (iv) availability of requisite key personnel (v) financial resources; (vi) details of quality system in place; (vii) past experience and performance; (viii) customer feedback (ix) Bank's feedback etc.
IB 30.1	The Employer reserves the right to reject any bid on the following accounts, apart from those mentioned in the bidding documents: i. Bidding Documents are not purchased by the bidder. ii. Bid is not received by the due date and time specified. iii. Cost of the bidding documents is not remitted. iv. Bid is not accompanied by Bid security as specified in the document; Bid security is inadequate; Bid guarantee is not in the specified format. v. Bid does not cover the complete scope of work. vi. Bid does not contain all required particulars as per Schedules & Forms prescribed in the bidding documents. vii. Deviations, conditionality or reservations have been introduced to any part of the bidding documents which may not be acceptable to the Employer in its sole discretion. viii. Bidder does not respond promptly and thoroughly to the request for supplementary information required for the evaluation of his Bid. ix. Bid does not meet minimum acceptable standards of completeness, consistency and detail. x. Bid received from any Black listed Firm / Contractor. If at any time it is found that a material misrepresentation of facts is made or uncovered; the information submitted by the bidder concerning his qualification was false and materially inaccurate or incomplete. If the bidder is the Lead Member of a consortium, then the entire consortium may be disqualified/ rejected.
IB 32.1	The Bidder shall furnish an unconditional Performance Security, equal to ten percent (10%) of the Contract Price in the form prescribed in the conditions of Contract.
IB 33	Text of Clause IB.33 is deleted and substituted as follows: Within fourteen (14) days from the date of furnishing of acceptable Performance Security under the Conditions of Contract, the successful bidder shall depute its representative duly authorized for formal signing of the Contract Agreement, Form of which is provided in the Bidding Documents.

IB 37	The following clause is hereby added: - (**REDRESSAL OF GRIEVANCE**) Mechanism for redressal of grievances shall be in accordance with Rule No. 48 of Public Procurement Rules 2004 (PPRA).
IB 38	The following Clause is hereby inserted: - **(MECHANISM OF BLACKLISTING)** Mechanism for blacklisting of Contractors shall be in accordance with Rule No. 19 of PPRA rules 2004 and "Revised SOP for Blacklisting (as on 25-02-2019)" attached herewith.

Annexure - 1 to Bid Data Sheet

FORMAT FOR POWER OF ATTORNEY FOR SIGNING OF BID

POWER OF ATTORNEY

Know all men by these presents, we _____(name and address of the registered office of the Bidder) do hereby constitute, appoint and authorize Mr. / Ms. _____R/o _____(name and address of residence) who is presently employed with us and holding the position of _____, as our attorney, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to the bid of the (please state the name and address of the bidder) for Bidding Document No. **[**_____**]** (the "tender"), including signing and submission of all documents and providing information / responses to National Grid Company of Pakistan Limited (NGC), representing us in all matters in connection with our bid for the said tender.

We hereby agree to ratify all acts, deeds and things done by our said attorney pursuant to this Power of Attorney and agree that all acts, deeds and things done by our aforesaid attorney shall and shall always be deemed to have been done by us.

For

(Signature)
(Name, Title, Email ID and Address)

Accepted
……(Signature)
(Name, Title, Email ID and Address of the Attorney)

ACKNOWLEDGMENT

Before me, a Notary Public for and in the City of _____, this _____ of _____ 2024 personally came and appeared:

NAME IDENTIFICATION DOCUMENT
_____ _____

Known to me to be the same person/s who executed the foregoing Special Power of Attorney in favor of _____, and acknowledged to me the same is/are his/her/their free and voluntary act and deed.
IN WITNESS WHEREOF, I have hereunto set my hand and affixed my notarial seal, the date and place above written.

NOTARY PUBLIC

Annexure - 2 to Bid Data Sheet

A. FORM OF UNDERTAKING BY THE JOINT VENTURE PARTNERS

(On Company's Letter Head)

THIS JOINT DEED OF UNDERTAKING executed 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 Identification No……for _____ associated with _____ of …… (hereinafter called the "**Employer**").

WHEREAS the Party No.1, Party No.2 and Party No.3 have entered into an Agreement dated…….
AND WHEREAS the Employer invited bids for the design, manufacture, Supply of Equipment Materials stipulated in the bidding documents under _____ _____ associated with _____.

AND WHEREAS Clause 2, Section-ITB and 'Qualification & Evaluation Requirement of the Bidder'(clause 13, 24 & 26 of ITB), and technical provisions forming part of the bidding documents, inter-alia, stipulates that an Undertaking of two or more qualified partners, meeting the requirements of 'Qualification & Evaluation Requirement of the Bidder', as applicable may bid, provided, the Joint Venture fulfills all other requirements under Clause 2, 13, 24 & 26 of ITB and in such a case, the Letter of Bids (Bid Form) shall be signed by the Partner –In Charge so as to legally bind all the Partners of the Joint Venture, who will be jointly and severally liable to perform the Contract and all obligations hereunder.

The above clause further states that this Undertaking 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 Undertaking between all the parties; under these presents and the bid in accordance with the requirements of Clause 2, 13, 24 & 26 (Section-ITB) 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 Deed of Undertaking 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:

2. In case of any breach or default of the said Contract by any of the parties to the Joint Venture, the party(s) do hereby undertake to 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 undertake to 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 this Deed of Undertaking to the Employer, with respect to any of the claims arising out of the performance or non-performance of the obligations set forth in this 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 this Deed of Undertaking.

5. It is expressly understood and agreed between the Parties to this Undertaking that the responsibilities and obligations of each of the Parties shall be as delineated in Annexure attached with this undertaking. 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.

6. It is also understood that this Undertaking 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 Undertaking 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 Undertaking or on the Joint Venture, other than the express provisions of the Contract.

7. This Undertaking 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 Deed of Undertaking do hereby agree that 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 Deed of Undertaking shall be irrevocable and shall form an integral part of the bid and shall continue to be enforceable till the Employer discharges the same or upon the completion of the Contract in accordance with its provisions, whichever is earlier. It shall be effective from the date first mentioned above for all purposes and intents.

IN WITNESS WHEREOF, the Parties to this Deed of Undertaking 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 ……..

Name ……..

Designation ……..

Signature ……..

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

(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 ……..

Name ……..

Designation ……..

Signature ……..
WITNESS :

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

(Signature of the authorized
representative)

I. ……..

II. ……..

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

Name ……..

Designation ……..

Signature ……..

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

(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 (03).

Annexure - 3 to Bid Data Sheet

B. FORM OF LETTER OF INTENT BY JV PARTNERS TO ENTER INTO JV AGREEMENT

THIS LETTER OF INTENT signed on this……. day of……. Two Thousandand ……..by……. a company incorporate 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 _____ associated with _____.

AND WHEREAS Clause 2, Section-ITB and 'Qualification & Evaluation Requirement of the Bidder'(clause 13, 24 & 26 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 & 26 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 & 26 of ITB), and technical provisions forming part of the bidding documents and in such a case, the Letter of Bid (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 as per proforma specified in this Section IV. 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 in accordance with the requirements of Clause 4.1, Section-ITB and 'Qualification Requirement of the Bidder', Section-Evaluation and Qualification Criteria, has been signed by all the parties.

NOW THIS UNDERTAKING WITNESSED 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 proforma specified in this Section IV. 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 proforma specified in this Section IV. 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 of the authorized
representative)

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.-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).

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Section III

Forms of Bid and Appendices to Bid

Form of Technical Bid

Bid Reference No. _____

_____

_____

(Name of Contract/Works)

To:

_____

_____

_____

We, the undersigned, declare that:

(a) We have examined the Bidding Documents including Instructions to Bidders, Bidding Data, Conditions of Contract, Contract Data, Specifications, Drawings, if any, Schedule of Prices and Addenda Nos. _____ in accordance with Instructions to Bidders (IB) 9 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 Pakistan hereby offer to execute and complete such Works and remedy any defects therein in conformity with the said Documents including Addenda.

(b) Our Bid consisting of the Technical Bid and the Price Bid shall be valid for a period of ……. days from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(c) As security for due performance of the under takings and obligations of our bid, we submit here with a Bid security, in the amount specified in Bidding Data Sheet, which is valid (at least) 28 days beyond validity of Bid itself.

(d) We undertake, if our Bid is accepted, to commence the Works and to deliver and complete the Works comprised in the Contract within the time(s) stated in Contract Data.

(e) We are not participating, as a Bidder or as a subcontractor, in more than one bid in this bidding process, other than alternative offers submitted in accordance with IB16 (as applicable).

(f) We agree to permit Employer or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors. This permission is extended for verification of any information provided in our

Technical Bid which comprises all documents enclosed herewith in accordance with IB.11.1 of the Bidding Data Sheet.

Name……

In the capacity of……

Signed……

Duly authorized to sign the Bid for and on behalf of……

Date……

Address……

Form of Price Bid

Bid Reference No. _____

_____

_____

(Name of Contract/Works)

To:

_____

_____

_____

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (IB)9;

(b) The total price of our Bid, excluding any discounts offered including Addenda thereto for the Total Bid Price of Rupees

(Rupees_____)

or such other sum as may be ascertained in accordance with the said Documents.

(c) The discounts offered and the methodology for their application is: ……

(d) Our Bid shall be valid for a period of …….. days from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(e) If our Bid is accepted, we commit to obtain a performance security in accordance with the Bidding Documents;

(f) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed and we do hereby declare that the Bid is made without any collusion, comparison of figures or arrangement with any other bidder for the Works.

(g) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

(h) We agree to permit Employer or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors. This permission is extended for verification of any information provided in our Technical Bid which comprises all documents enclosed herewith in accordance with IB.11.1 of the Bidding Data Sheet.

(i) If awarded the contract, the person named below shall act as Contractor's Representative.

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.

Name……

In the capacity of……

Signed……

Duly authorized to sign the Bid for and on behalf of……

Date……

Address……

Witness:

Signature: ……

Name……

Address……

Occupation: ……

Appendix-A to Bid

SPECIAL STIPULATIONS
Clause
Conditions of Contract

1.	Law Applicable	5.1(b)	The law to be applied is the law of Islamic Republic of Pakistan.
2.	Amount of Performance Security	10.1	10% of Contract Price stated in the Letter of Acceptance.
3.	Time for Furnishing Programme	14.1	Within 30 days from the date of receipt of Letter of Acceptance.
4.	Minimum amount of third-party Insurance	23.2	Rs. 1,000,000 per occurrence with number of occurrences unlimited.
5.	Time for Commencement	41.1	Within 42 days from the date of issuance of Letter of Acceptance.
6.	Time for Completion	43.1, 48.2(a)	**18-months (547 days)**
7.	a) Amount of Liquidated Damages	47.1	Lot-I: 0.05% for each day of delay in completion of the Works subject to a maximum of 10% of Contract Price stated in the Letter of Acceptance. In case facility / works are of independent of each other and part of the facility / works can be used for its intended purpose, the LD will only be applicable for the remaining part.
	b) Amount of Bonus	47.3	Not Applicable
8.	Defects Liability Period	49.1	365 days from the effective date of Taking Over Certificate.
9.	Percentage of Retention Money	60.2(a)	10% of the amount of Interim Payment Certificate.
10.	Limit of Retention Money	60.2(a)	10% of Contract Price stated in the Letter of Acceptance.
11.	Minimum amount of Interim Payment Certificates (Running Bills)	60.2	20% (at least) more than the amount of all applicable retentions and deductions on the said bill.
12.	Time for Payment	60.10	30 days.
13.	Mobilization Advance (Interest Free)	60.12	10% of the Contract Price
14.	Increase or Decrease of Cost	70.1	Applicable

Appendix-B to Bid

FOREIGN CURRENCY REQUIREMENTS (Not Used)

1. The Bidder may indicate here in below his requirements of foreign currency (if any), with reference to various inputs to the Works.

2. Foreign Currency Requirement as percentage of the Bid Price excluding Provisional Sums _____%.

3. Table of Exchange Rates

Unit of Currency	Equivalent in Pak. Rupees
Australian Dollar	----------
Euro	----------
Japanese Yen	----------
U.K. Pound	----------
U.S. Dollars	----------
----------	----------
----------	----------

Appendix-C to Bid

PRICE ADJUSTMENT UNDER CLAUSE 70 OF CONDITIONS OF THE CONTRACT

Price Adjustment Formula for BOQ items C, D, F, G, H & M

Price Adjustment Formula for BOQ item C & D(Foundations), E (Access Roads), F (Erection of Steel Towers), G (Stringing of Conductor and OPGW) and K (additional works)

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 Bill of Quantities [Items C, D, F, G, H & M] 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, Access Road & 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 provisions of Contract. 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 based on the following formula:

For Foundation Works (Items C, D, F & M):

$$A1 = A/100 \left(30 + 20 \frac{UL1}{UL} + 11 \frac{L1}{L} + 5 \frac{P1}{P} + 11 \frac{D1}{D} + 18 \frac{S1}{S} + 5 \frac{C1}{C}\right)$$

For Installation Works (Erection & Stringing Items G & H):

$$A1 = A/100 \left(30 + 26 \frac{UL1}{UL} + 14 \frac{L1}{L} + 10 \frac{P1}{P} + 20 \frac{D1}{D}\right)$$

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 Rawalpindi 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 Rawalpindi 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 Rawalpindi 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 Rawalpindi 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 Rawalpindi 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 Rawalpindi 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 Rawalpindi 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 Rawalpindi 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 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 Engineer 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 Engineer 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.

Appendix-D to Bid

BILL OF QUANTITIES

A. Preamble

General

1. The Schedule of Quantities shall be read in conjunction with the Conditions of Contract, Specifications and Drawings. The Schedules do not generally give a full description of the Services to be performed under each item. Bidders shall be deemed to have read the Technical Specifications and other sections of the Bidding Documents and reviewed the Drawings to ascertain the full scope of the requirements included in each item prior to filling in the rates and prices. The entered rates and prices shall be deemed to include for the full scope as aforesaid, including overheads and profit.

2. If bidders are unclear or uncertain as to the scope of any item, they shall seek clarification in accordance with IB 8 prior to submitting their bids.

3. The quantities given in the Schedule of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work executed and measured by the Contractor and verified by the Engineer and valued at the rates and prices entered in the priced Schedule of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix in accordance with provisions of the Contract.

4. The rates and prices entered in the priced Schedule of Quantities shall, except insofar as it is otherwise provided under the Contract include all costs of Contractor's plant, labor, supervision, materials, execution, insurance, profit, taxes and duties, together with all general risks, liabilities and obligations set out or implied in the Contract. Furthermore all duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause, as on the date 28 days prior to deadline for submission of Bids, shall be included in the rates and prices and the total Bid Price submitted by the Bidder. The price shall include all type of taxes except PST.

5. A rate or price shall be entered against each item in the priced Schedule of Quantities, whether quantities are stated or not. The cost of items against which the Contractor will have failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Schedule of Quantities.

6. The whole cost of complying with the provisions of the Contract shall be included in the items provided in the priced Schedule of Quantities, 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.

7. General directions and description of work and materials are not necessarily repeated nor summarized in the Schedule of Quantities. References to the relevant sections of the Bidding

Documents shall be made before entering prices against each item in the priced Schedule of Quantities.

8. Contractor shall be responsible for arrangement of all consumable materials for execution of works within the prices quoted in Price schedules/BoQ.

9. Provisional sums if included and so designated in the Schedule of Quantities shall be expended in whole or in part at the direction and discretion of the Engineer in accordance with Conditions of Contract.

10. As this a measurement type contract so quantities may increase or decrease and / or their types may vary resultantly the contract price may change. The Engineer is authorized to measure such work and accordingly approve the invoices. The Employer shall not stop payment merely it is beyond the price of the contract. However, such changes shall immediately be conveyed to Project Management Office (PMO) NGC / Change Control Board/ Steering Committee. In case any irregularity is found, the Employer shall reserve the right to withhold the payments and recover its loss from any amount due or to be due to the contractor besides other remedial measures.

Units & Abbreviations

11. Units of measurement, symbols and abbreviations expressed in the Bidding Documents shall comply with the System International Unites (SI Units).

12. The following abbreviations shall be used in the Price Schedules:

Abbreviation

Pakistani Rupees	PKR
Number	No.
Kilometre	km
Kilogram	kg
Cubic Meter	Cu.m
Provisional Sums	PS
Percent	%
Quantity	Qty

Pricing

13. Prices shall be filled in indelible ink, and any alterations necessary due to errors, etc., shall be initialed by the Bidder.

14. As specified in the Bid Data Sheet prices shall be subject to adjustment in accordance with the corresponding Appendix-E to Price Bid (Price Adjustment under Clause 70 of Conditions of the Contract) to the Contract Agreement.

15. For each item, bidders shall complete each appropriate column in the respective Schedules, giving the price breakdown as indicated in the Schedules. Prices given in the Schedules against each item shall be for the scope covered by that item as detailed in Section VI Specifications - Technical Specifications, Drawings or elsewhere in the Bidding Documents.

16. The TOTAL for each Schedule and TOTAL of the Grand Summary shall be deemed to be the total price for executing and completing the Facilities in accordance with the Contract, whether or not each item has been priced.

17. When requested by the Employer to make payments or part payments, valuing variations or evaluating claims, or for such other purposes as the Employer may reasonably require, the Contractor shall provide the Employer with a breakdown of any composite or lump sum items included in the Schedules.

18. Except as otherwise expressly provided under the Conditions of Contract, the unit rates and lump sum amounts entered in the Price Schedules will be the rates at which the Contractor will be paid, and shall be deemed to include for the full scope and all costs incurred by the Contractor in the performance of the Facilities, the provision of services including his overheads, income tax, super tax, other indirect costs, profits and costs of accepting the general risks, liabilities and obligations set forth or implied in the Contract, except for such costs which are specified as reimbursable under the Contract.

19. Arithmetic errors will be corrected by the Employer as per IB 27.

20. Price of any other item not specifically covered in the Price Schedules but is required for the completion, commissioning and operation of the overhead transmission line shall be deemed to be included in the Bill of Quantities.

21. The Contractor of any Lot may be required by the Engineer/Employer to carry out foundation /installation work on any location falling in any other Lot.

22. The Contractor will be responsible for arrangement of all necessary security measures for protection of Plants, equipment, personnel and other assets of Contractor or Employer at site until taking over of works by the Employer.

23. The Contractor shall take all the safeguards at site for safety/security of men, material and machinery at his own responsibility and cost.

24. The Contractor shall make available and install 12 number of WEBCAMs alongside necessary storage of atleast 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.

Appendix-E to Bid

PROPOSED CONSTRUCTION SCHEDULE

Pursuant to Sub-Clause 43.1 of the General Conditions of Contract, the Works shall be completed on or before the date stated in Appendix-A to Bid. The Bidder shall provide as Appendix-E to Bid, the Construction Schedule in the bar chart (CPM, PERT or any other to be specified herein) showing the sequence of work items and the period of time during which he proposes to complete the Works including the activities like mobilization, survey for stalking, Civil Works (Foundations), Erection of Towers, Stringing, OPGW Splicing, testing and commissioning of Works to be executed 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.	Mobilization	
2.	Re-validation of T/Line route	
3.	Access Road Construction	
4.	Foundation Construction a) Submission of Proposed Section b) List of Vouchers and Payment c) Notice to Proceed (NTP) from Employer [PCC Sub-Clause 41.1] d) Commencement e) Completion	
5.	Tower Erection a) Submission of Proposed Section b) List of Vouchers and Payment c) Notice to Proceed (NTP) from Employer [PCC Sub-Clause 41.1] d) Commencement e) Completion	
6.	Stringing a) Submission of Proposed Section b) List of Vouchers and Payment c) Notice to Proceed (NTP) from Employer [PCC Sub-Clause 41.1] d) Commencement e) Completion	
7.	Testing & Pre-commissioning a) Commencement b) Completion	
8.	Commissioning	
9.	Environmental Safeguards Implementation a) Commencement Completion	
10.	Biodiversity Action Plan (BAP) Implementation b) Commencement	

	c) Completion	

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)				
1.	Signing of contract	30	60	90	120	---------
2.	Commencement					
3.	Mobilization					
4.	Check Survey					
5.	Civil Works (Foundations)					
6.	Erection of Towers					
7.	Stringing					
8.	Testing & commissioning					
9.	Environmental Safeguards Implementation					
10.	Biodiversity Action Plan (BAP) Implementation					

The proposed program of Works shall base on the Schedule of Implementation as per Bidding Documents.

Note: The bidder shall also 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		
Piling Crew		
Erection Crew		
Stringing Crew		

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

Appendix-F to Bid

METHOD OF PERFORMING THE WORK

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

1. Organization Chart indicating head office and field office personnel involved in management and supervision, engineering, equipment maintenance and purchasing.

2. Detailed Work Plan depicting the detail of activity (atleast level-04) and the expectation of cash flows.

3. Mobilization in Pakistan, the type of facilities including personnel accommodation, office accommodation, provision for maintenance and for storage, communications, security and other services to be used.

4. The method of executing the Works, the procedures for installation of equipment and machinery and transportation of equipment and materials to the site.

5. Quality control / Quality assurance measures to be adopted including procedures to be followed for carrying out all tests required under specifications.

6. Proposed methodology to implement Project Safeguard Requirements.

Personnel

Form PER – 1: Proposed Personnel

Bidders should provide the names of suitably qualified personnel to meet the specified requirements for each of the positions listed in Section 2. The data on their experience should be supplied using the Form below for each candidate.

1.	**Title of position**
	Name
2.	**Title of position***
	Name
3.	**Title of position***
	Name
4.	**Title of position***
	Name
5.	**Title of position***
	Name

Form PER – 2: Resume of Proposed Personnel

The Bidder shall provide all the information requested below. Fields with asterisk (*) shall be used for evaluation.

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

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

From*	To*	Company, Project, Position and Relevant Technical and Management Experience*

Appendix-H to Bid

EQUIPMENT

Form EQ – 1: List of Major Equipment – Related Items

The Bidder will provide on Sheet 2 of this Appendix a list of all major equipment and related items, under separate heading for items owned, to be purchased or to be arranged on lease by him to carry out the Works. The information shall include make, type, capacity, and anticipated period of utilization for all equipment which shall be in sufficient detail to demonstrate fully that the equipment will meet all requirements of the Specifications. The list of major equipment for construction works of the project should be addressed under the following categories:

a) Clearance of Right of Way
b) T/Line Route Survey
c) Access Road Construction
d) Foundation Construction
    i) For dry foundation crew
    ii) For crew working in water logged area
e) Pile work/Pile Caps with Beams
f) Tower Erection
g) Conductor & OPGW stringing
h) Any other equipment required to complete the Works in all respects.

Form EQ – 2: List of Major Equipment

Owned Purchased or Leased	Description of Unit (Make, Model, Year)	Capacity HP Rating	Condition	Present Location or Source	Date of Delivery at Site	Period of Work on Project
1	2	3	4	5	6	7
A) Right of way **a**. Owned **b.** To be Purchased **c.** To be arranged on Lease						
B) Survey for staking **a**. Owned **b.** To be Purchased **c.** To be arranged on Lease						
C) Foundation work* **a**. Owned **b.** To be Purchased **c.** To be arranged on Lease						
D) Pile work/Pile Caps with Beams **a**. Owned **b.** To be Purchased **c.** To be arranged on Lease						
E) Erection works **a**. Owned **b.** To be Purchased **c.** To be arranged on Lease						
F) Conductor &OPGW stringing **a**. Owned **b.** To be Purchased **c.** To be arranged on Lease						

* Foundation work will involve both dry type foundation and water logged foundation equipment.

Appendix-I to Bid

CONSTRUCTION CAMP AND HOUSING FACILITIES

The Contractor in accordance with Clause 34 of the Conditions of Contract 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.

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.).
6. Detail of testing Lab with testing equipment etc.

Appendix-J to Bid

ORGANIZATION CHART

FOR THE
SUPERVISORY STAFF AND LABOR

Appendix-K to Bid

LIST OF SUBCONTRACTORS

I/We intend to subcontract the following parts of the Work to subcontractors. In my/our opinion, the subcontractors named hereunder are reliable and competent to perform that part of the work for which each is listed.

Enclosed are documentation outlining experience of subcontractors, the curriculum vitae and experience of their key personnel who will be assigned to the Contract, equipment to be supplied by them, size, location and type of contracts carried out in the past.

Part of Works (Give Details)	**Subcontractor (With Complete Address)**
1	**2**

Note:- The subcontractor will not be replaced without prior approval of the Employer.

Appendix-L to Bid

SOURCES OF MATERIAL
LIST OF MATERIALS LIKE CEMENT, REINFORCING STEEL, COARSE AND FINE AGGREGATE

The Bidder shall list in this Schedule the names of materials forming part of tower foundations such as cement, reinforcing steel, coarse and fine aggregate which he intends to procure in connection with this Contract along with the names and complete addresses of the sources.

DescriptionName of SourceAddress
1. Sand
2. Coarse Aggregate
3. Cement
4. Reinforcing Steel
5. Fill Material
6. Any other material

Use additional sheets if required.

Appendix-M To Bid

ESTIMATED PROGRESS PAYMENTS

Bidder's estimate of the value of work which would be executed by him during each of the periods stated below, based on his Program of Works and the Rates in the Bill of Quantities.

Period	Amounts (PKR)
1st Month	
2nd Month	
3rd Month	
4th Month	
5th Month	
6th Month	
…	
…	
…	
16th Month	
17th Month	
18th Month	
Total Bid Price	

Initials of Signatory to Bid: ……

Appendix-N to Bid

DEVIATIONS

Form N1-Deviations from Contractual Conditions

Deviations if any, which the bidder has taken to the Contractual Conditions in preparation of his bid, must be listed below.

Sr. No.	Clause No. /Section No.	Deviations

Note: Attach additional sheets, if necessary.

Form N2-Deviations from Technical Conditions

Deviations if any, which the Bidder has taken to the Technical Provisions in preparation of his bid, must be listed below.

Sr. No.	Clause No. /Section No.	Deviations

Note: Attach additional sheets, if necessary.

Appendix-O to Bid

PROJECT SAFEGUARD IMPLEMENTATION ACTION PLAN AND METHODOLOGY

The Bidder is required to provide a detailed action plan and implementation methodology & schedule to establish its approach to ensure implementation of project's safeguard requirements.

Appendix-P to Bid

SITE SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

The Bidder is required to provide an executable site-specific Environmental Management Plan for the Project to establish its understanding and subsequent approach for the Project.

Appendix-Q to Bid

INTEGRITY PACT

**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 time 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: ……
Signature: ……
[Seal]

Name of Seller/Supplier: ……
Signature: ……
[Seal]

ADB Integrity Covenant

1. The ADB Integrity Covenant applies throughout the procurement process and performance/execution process of the Contract (if awarded).

2. Firms and individuals, including but not limited to Bidders, suppliers, Contractors(if awarded), agents, subcontractors, subconsultants, service providers, subsuppliers, manufacturers (including their respective officers, directors, employees and personnel) participating in the procurement and performance/execution of the Contract are required to observe the highest standard of ethics, as applicable and in accordance with Asian Development Bank's Anticorruption Policy (1998, as amended from time to time). We acknowledge that we have read and understand ADB's Anticorruption Policy and Integrity Principles and Guidelines (2015, as amended from time to time).

3. For the purpose of provision 2, the terms are set forth below as follows:
   (i) "corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;
   (ii) "fraudulent practice" means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;
   (iii) "coercive practice" means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
   (iv) "collusive practice" means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party;
   (v) "abuse" means theft, waste, or improper use of assets related to ADB-related activity, either committed intentionally or through reckless disregard;
   (vi) "conflict of interest" means any situation in which a party has interests that could improperly influence that party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations;
   (vii) "integrity violation" means any act, as defined under ADB's Integrity Principles and Guidelines (2015, as amended from time to time), which violates ADB's Anticorruption Policy, including (i) to vi) above and the following: obstructive practice, violations of ADB sanctions, retaliation against whistleblowers or witnesses, and other violations of ADB's Anticorruption Policy, including failure to adhere to the highest ethical standard.

4. Pursuant to provision 2, ADB will impose remedial actions on a firm or an individual at any time, in accordance with ADB's Anticorruption Policy and Integrity Principles and Guidelines, including declaring ineligible, either indefinitely or for a stated period of time, to participate [1]in ADB- financed, -administered, or -supported activities, or to benefit from an ADB-financed, -administered, or -supported contract, financially or otherwise, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations.

5. All Bidders, consultants, Contractors (if awarded), suppliers, manufacturers, service providers, and other third parties engaged or involved in the procurement and execution/performance of the Contract and their respective officers, directors, employees and personnel, are obliged to cooperate fully in any investigation when requested by ADB to do so. As determined on a case by case basis by ADB, such cooperation includes, but is not limited to, the following:
   (a) being available to be interviewed and replying fully and truthfully to all questions asked;

[1] Whether as a Contractor, Subcontractor, Consultant, Manufacturer or Supplier, or Service Provider; or in any other capacity (different names are used depending on the particular Bidding Document).

(b) providing ADB with any items requested that are within the party's control including, but not limited to, documents and other physical objects;

(c) upon written request by ADB, authorizing other related entities to release directly to ADB such information that is specifically and materially related, directly or indirectly, to the said entities or issues which are the subject of the investigation;

(d) cooperating with all reasonable requests to search or physically inspect their person and/or work areas, including files, electronic databases, and personal property used on ADB activities, or that utilizes ADB's Information and Communications Technology (ICT) resources or systems (including mobile phones, personal electronic devices, and electronic storage devices such as external disk drives);

(e) cooperating in any testing requested by ADB, including but not limited to, fingerprint identification, handwriting analysis, and physical examination and analysis; and

(f) preserving and protecting confidentiality of all information discussed with, and as required by, ADB.

6. All Bidders, consultants, Contractors(if awarded) and suppliers shall require their officers, directors, employees, personnel, agents to ensure that, in its contracts with its sub-consultants, subcontractors, and other third parties engaged or involved in the procurement and execution/performance of the Contract, and other third parties similarly are obliged to cooperate fully in any investigation when requested by ADB to do so.

We, the undersigned, declare that:

7. We, our directors, key officers, key personnel, including any subcontractor, consultants, subconsultants, manufacturers, service providers or supplier for any part of the Contract, do not have any conflict of interest in accordance with IB 3.2.

   If there is any conflict of interest, please state details:

   Parties involved in the conflict of interest: _____

   Details about the conflict of interest: _____

8. At any time following submission of our Bid, we shall permit, and shall cause our joint venture partners, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any subcontractors, consultants, subconsultants, manufacturers, service providers or suppliers for any part of the Bid and/or Contract (if awarded) to permit ADB or its representative to inspect our site, assets, accounts and records and other documents relating to the Bid submission and performance/execution of the Contract (if awarded) and to have them audited by auditors appointed by ADB. We understand that failure of this obligation may constitute obstructive practice that may result in debarment and/or contract termination. This provision 8 shall survive termination and/or expiration of the Contract (if awarded).

9. The Bidder or Contractor (if awarded) undertakes that no fees, gratuities, rebates, gifts, commissions or other payments, other than those shown in the Form of Price Bid and Integrity Pact, have been given or received in connection with the procurement process or in the contract execution/performance.

10. Our firm, joint venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract, are not subject to, or not controlled by any entity or individual that is subject to a temporary suspension or a debarment imposed by the Asian Development Bank; or a debarment imposed by the Asian Development Bank in accordance with the Agreement for Mutual Enforcement of Debarment Decisions between the Asian Development Bank and

other multilateral development banks. If we become subject to such temporary suspension and debarment during the procurement and performance/execution of the Contract, we shall inform the Employer.

11. Our firm, joint venture partners, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or suppliers, key officers, directors and key personnel are not from a country which is prohibited to export goods or services to, or receive any payments from the Employer's country and/or are not prohibited to receive payments for particular goods or services by the Employer's country 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. We shall inform the Employer if the situation described in this declaration 11 occurs during the procurement and execution/performance of the Contract.

12. Regardless of whether the Contract will be awarded to us, we shall preserve all accounts, records and other documents related to Bid submission for at least 3 years from the date of submission of the bid or the period prescribed in applicable law, whichever is longer. If we are awarded the Contract, we shall preserve all accounts, records and other documents related to the procurement and performance/execution of the Contract for at least 5 years after completing the works contemplated in the relevant Contract or the period prescribed in applicable law, whichever is longer.

13. We certify on behalf of the Bidder, that the information provided in the bid has been fully reviewed, given in good faith, and to the best of our knowledge is true and complete. We understand that it is our obligation to inform the Employer of any changes to the information as and when it becomes known to us. We understand that any misrepresentation that knowingly or recklessly misleads or attempts to mislead may lead to the automatic rejection of the Bid or cancellation of the Contract, if awarded; and may result in remedial actions, in accordance with ADB's Anticorruption Policy (1998, as amended to date) and Integrity Principles and Guidelines (2015, as amended from time to time).

Name of Employer: ……..
Signature: ……..
[Seal]

Name of Contractor: ……..
Signature: ……..
[Seal]

Appendix-R to Bid

BIDDER'S QUALIFICATION FORMS

QF-1	General Information
QF-2	Construction Experience
QF-3	Performance Certificate
QF-4	Current Contract Commitments
QF-5	Financial Data
QF-6	Annual Turnover Data
QF-7	Financial Resources
QF-8	Bank Certificate
QF-9	Pending Litigation

Note:-

1. These forms shall be filled up and furnished by the Bidder and its Joint Venture partner(s), if any.
2. If necessary, additional sheets may be added to the forms. Each page of each form should be clearly marked in the right top corner as follows: Form QF1, page 1; Form QF1, page 2, etc.
3. Some forms will require attachments. Such attachments should be clearly marked as follows: Attachment 1 to Form QF1, Attachment 2 to Form QF1, etc.

Form QF-1: General Information

Bidder and its Joint Venture Partner(s) and/or Subcontractors are requested to complete the information in this form. Nationally information of Bidders should also be provided.

1.	Name of Bidder	
2.	Head office address	
3.	Local office address (if any)	
4.	Telephone	Contract
5.	Facsimile	e-mail
6.	Place of incorporation/registration	Year of incorporation/registration
7.	Main lines of Business 1. 2. 3. 4.	 Since: Since: Since: Since:

Note:

Copies of following credentials shall be attached:

(a) Copy of incorporation/registration certificate
(b) Organization chart
(c) PEC registration certificate in the appropriate category
(d) Registration with tax authorities (FBR and Provincial tax authorities) and Active Taxpayer status

Signature and Seal of Bidder:

Form QF-2: Construction Experience

Note: To be filled in accordance with criteria described in clause IB3.1 (b) Section-II of the bidding documents

(For a period of Last 10 Years)

Name of the Project: ……

Order Placed by (full address of Employer)	Order No. and date	Description of Works	Value of order	Date of completion as per contract	Date of actual completion	Remarks indicating reasons for late completion, if any	Has the project been running satisfactorily? (Attach a certificate from the Employer)	Contact person along with Telephone No., Fax No. and email address

Signature and Seal of the Bidder……

Place:

Date:

Form QF-3: Performance Certificate

It is to certify that M/s._____ has conducted the following works against mentioned project.

Sr.No.	Contract No. & Date	Designation & address of order placing authority/User	Name of Project	Description of Works	Date of Commencement	Date of Completion

The above services/Works have been performed against our Project and their performance is found satisfactory.

Date of issuing _____

Signature of issuing authority with seal
Name and designation of issuing authority
Address along with Email, Phone No. and
Fax of issuing authority

Note:

i. In case of those bidders who have provided services to NGC shall furnish the details of such works in the above Performa which shall be signed by their authorized signatory along with seal and certificate is not required from the Employer in this respect.

In case the performance certificate is not verifiable through the given contact address and email, the bid may be rejected.

Form QF-4: 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: _____

Current Contract Commitments

No.	Name of Contract	Employer's Contact (Address, Tel, Fax)	Total Contract Value	Contract Completion Date	Outstanding Contract Value (X) [a]	Remaining Contract Period in months (Y) [b]	Monthly Financial Resources Requirement (X / Y)
1							
2							
3							
4							
Total Monthly Financial Requirement for Current Contract Commitments							**$** . . . . .

[a] *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).*

[b] *Remaining contract period to be calculated from 28 days prior to bid submission deadline.*

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

Form QF-5: Financial Data

Financial Data for Previous 3 Years			
Particular			
Total Assets			
Total Liabilities			
Net Worth			
Current Assets			
Current Liabilities			
Information from Income Statement			
Total Revenues			
Profits Before Taxes			
Profits After Taxes			
Attached are copies of financial statements (balance sheets including all related notes, and income statements) for the last three years, as indicated above, complying with the following conditions.			
• All such documents reflect the financial situation of the Bidder and not sister or parent companies. • Historic financial statements must be audited by a certified accountant. • Historic Financial statements must be complete, including all notes to the financial statements. • Historic financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted).			

Signature and Seal of the bidder:

Form QF-6: Annual Turnover Data

Name of Bidder/Joint Venture Partner:

Bidder and its Joint Venture Partner(s) are requested to complete the information in this form separately. The information supplied should be the annual turnover of the Bidder, in terms of the amounts billed to clients for each year for work in progress or completed. In case of a joint venture, a copy of the Joint Venture Agreement must be attached. The average Annual Turnover may include turnover of affiliates and subsidiaries to the extent of shareholding percentage of bidding company provided the turnover is accrued from similar business activity as the bidding company.

Use a separate sheet for bidder and its Joint Venture partner(s).

Annual turnover data for the following last five (05) fiscal years			
Year	Amount [Respective Currency]	Exchange Rate	Equivalent Amount (PKR)
Average Annual Turnover			

Signature and Seal of Bidder:

Form QF-7: Financial Resources

Form QF – 7: 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[a]	
3	Other Financial Resources	
	Total Available Financial Resources	

[a] *To be substantiated by a letter from the bank issuing the line of credit.*

[Note: No credit line after opening of bids shall be acceptable. Any withdrawal of the credit lines from the bidder's creditors during validity of bid shall be considered a withdrawal of bid]

Form QF-8: Bank Certificate

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

If the contract for the work, namely,……. is awarded to the above firm, we shall be able to provide overdraft/credit facilities to the extent of Rs……. to meet their working capital 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 the work, namely……. is awarded to the above Joint Venture, we shall be able to provide overdraft/credit facilities to the extent of Rs……. to M/s……. to meet the working capital requirements for executing the above contract.

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

Form QF-9: Pending Litigation

Each Bidder or member of a JV must fill in this form

Pending Litigation					
Year	Name of Other Party(s)	Matter of Dispute	Litigation where (Court/ arbitration)	Amount involved	Value of pending claim as a %age of net worth

Signature and Seal of the bidder:

STANDARD FORMS

BID SECURITY (Bank Guarantee)

Security Executed on_____
(Date)
Name of Surety (Bank) with address_____
(Scheduled Bank in Pakistan)
Name of Principal (Bidder) with Address:_____
_____
Guaranteed Amount/Sum of Security Rupees_____(Rs._____)
Bid Reference No._____

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bid and at the request of the said Principal (Bidder) we, the Surety above named, are held and firmly bound unto _____ (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 Bidder has submitted the accompanying Bid dated ___ for Bid No. ___ for ___ (Particulars of Bid) to the said Employer; and

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

(1) That the Bid Security shall remain in force up to and including the date 28 days after the deadline for validity of bids as stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Surety is hereby waived;
(2) That the Bid Security of unsuccessful Bidders will be returned by the Employer after expiry of its validity or upon signing of the Contract Agreement; and
(3) That in the event of failure of the successful Bidder to execute the proposed Contract Agreement, involvement in Corrupt and/or fraudulent practices and/or furnish the required Performance Security, the entire said sum be paid immediately to the said Employer pursuant to Clause 19.6 of the Instructions to Bidders 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 fourteen (14) 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 fulfillment 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 Surety shall forthwith pay the Employer the said sum upon first written demand of the Employer (without cavil or argument) and without recourse to the Principal or any other third party in the necessity any proceeding whatever judicial or otherwise irrespective of any dispute, difference or disagreement between the Bidder and the Employer or contestation by any other party/person. We agree that for the purpose of this Bid Bond, the Employer shall be the sole and exclusive judge for determining whether events listed in ____ above have occurred and any written demand made in the manner stipulated herein by the Employer shall be conclusive evidence of the occurrence of one or more of the events listed above. We shall at all times be bound to the first written demand of the Employer to pay the Employer forthwith the amount hereby agreed 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 Surety at its address given above.

PROVIDED ALSO THAT the Employer shall be the sole and final judge for deciding whether the Principal (Bidder) 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 the said requirements and the Surety shall pay without objection the said sum upon demand from the Employer forthwith and without any reference to the Principal (Bidder) or any other person.

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

SURETY (Bank)

WITNESS:

Signature _____

1. _____

Name _____

_____

Title _____

Corporate Secretary (Seal)

Corporate Guarantor (Seal)

2. _____

_____

Name, Title & Address

FORM OF PERFORMANCE SECURITY
(Bank Guarantee)

Guarantee No. _____
Executed on _____
Expiry date _____
Guarantee Amount_____

[Letter by the Guarantor to the Employer]

Name of Guarantor (Bank) with address:
_____
(Scheduled Bank in Pakistan)
Name of Principal (Supplier or Contractor) with address:
_____
Guaranteed Amount/Sum of Security against services/works/contracts (express in words and figures)_____.
(Hereinafter referred to as the "Bank/Guarantor" which expression shall be deemed to include its respective successors-in-interest and assignee and shall be deemed as well to include any financial institutions which may subsequently become the party).

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 Guaranteed Amount/Sum 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_____
_____(Project detail etc.)

NOW THEREFORE, if the Principal (Supplier or Contractor as applicable) shall well and truly perform and fulfill all the undertakings, covenants, terms and conditions of the said Documents to which reference is here made for all purposes during the original terms of the said Documents and any extensions thereof that p:iay 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 tha 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 the issuance of Warranty Certificate in accordance with Clause ___ , Warranty, of Conditions of Contract.

Our total liability under this Guarantee is limited to the Sum stated herein 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 which Sum we irrevocably and unconditionally agree to pay immediately upon any request for payment or demand received on which/the end __ (date), failing which we shall be discharged of our liability, if any, under this Guarantee.

We, _____ (the Guarantor), waiving all objections and defenses under the Contract, do hereby unconditionally, irrevocably and independently guarantee and undertake to pay to the Employer without protest, demur, delay and without reference, notice or recourse to contractor to any other person 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 and hereby expressly waive all rights to deny our obligation to the Employer irrespective of any dispute, difference, ongoing litigation, arbitration proceeding or disagreement between ___ and ___ , or contestations by any other party or person, any Sum or Sums up to the :1mount 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, exclusive and final judge for deciding whether the Principal has duly performed his obligations under the Contract or has defaulted in fulfilling said obligations and any written demand to the Guarantor made in the manners specified above shall be conclusive evidence of failure to comply with,. _____ 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.

The Guarantee shall be a continuing security and shall remain in operation until ___ after the expiration, termination of the contract or any extension thereto.
PROVIDED FURTHER THAT until the expiry date of the Guarantee, the Employer shall be entitled to present written demand(s) to the Guarantor in the manner specified above for any amount up to the aggregate Guaranteed Amount. The Guarantor agrees that nothing in this Guarantee shall bar the Employer from presenting multiple written demands to the Guarantor, provided that the amount claimed in the written demand(s) shall not collectively exceed the aggregate Guaranteed Amount.
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.

Witness: Guarantor (Bank)

1. _____
   _____
   Corporate Secretary (Seal)

Signature_____
Name_____

Title_____

2. _____
_____ _____
Name, Title & Address Corporate Guarantor (Seal)

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 witnesseth 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) The Letter of Acceptance;
   (c) The completed Form of Bid;
   (d) Special Stipulations (Appendix-A to Bid);
   (e) The Particular Conditions of Contract;
   (f) The General Conditions;
   (g) The priced Bill of Quantities;
   (h) The completed Appendices to Bid;
   (i) The Drawings;
   (j) The Specifications.
   (k) _____ (any other)

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 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 Employer
_____
(Seal)

Signed, Sealed and Delivered in the presence of:

Witness:

_____

(Name, Title and Address)

Witness:

_____

(Name, Title and Address)

MOBILIZATION ADVANCE GUARANTEE/BOND

Guarantee No._____ Date _____

WHEREAS _____(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 Rupees _____ (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 the mobilization advance for the performance of his obligations under the said Contract.

AND WHEREAS, _____
(Scheduled Bank in Pakistan)
(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 fulfilment 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, 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 remain in force until the advance is fully adjusted against payments from the Interim Payment Certificates of the Contractor or until _____whichever is earlier.
(Date)
The Guarantor's liability under this Guarantee shall not in any case exceed the sum of Rupees _____(Rs _____).

This Guarantee shall remain valid up to the aforesaid date and shall be null and void after the aforesaid date or earlier if the advance made to the Contractor is fully adjusted against payments from Interim Payment Certificates of the Contractor provided that the Guarantor agrees that the aforesaid period of validity shall be deemed to be extended if on the above mentioned date the advance payment is not fully adjusted.

GUARANTOR

1. Signature _____
2. Name _____
3. Title _____

WITNESS

1. _____
_____
Corporate Secretary (Seal)

2. _____ _____
(Name Title & Address) Corporate Guarantor (Seal)

Section IV
General Conditions of Contract

SECTION-IV GENERAL CONDITIONS OF CONTRACT

This bidding document follows the FIDIC conditions of contract for construction works. The Conditions of Contract Comprise of two Sections: Section-IV – General Conditions of Contract, and Section-V – Particular Conditions of Contract.

All the general Conditions shall be as per the FIDIC documents indicated below. These shall be read along with the Particular Conditions of Contract for interpretation. In case of any discrepancy between these General Conditions of Contract and the Particular Conditions of the Contract of Section-V, the provisions under the latter shall govern.

FIDIC FEDERATION INTERNATIONALE DES INGENIEURS – CONSEILS

CONDITIONS OF CONTRACT
FOR WORKS OF CIVIL
ENGINEERING CONSTRUCTION

FOURTH EDITION 1987

Reprinted 1988 with editorial amendments
Reprinted 1992 with editorial amendment

Section V
Particular Conditions of Contract

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PARTICULAR CONDITIONS OF CONTRACT

(Mandatory Provisions not to be Amended / Substituted except as instructed by PEC)

1.1 Definitions

A. (a) (i) The Employer is: National Grid Company of Pakistan Limited (NGC)

Chief Engineer (MP&M), NGC,
8th Floor, Shaheen Complex,
Egerton Road, Lahore-Pakistan
Telephone No.
Fax No.
E-mail address: cempm@ntdc.com.pk

(a) (iv) The Engineer is: National Engineering Services Pakistan (Pvt.) Limited – NESPAK
represented by:

Head Power and Mechanical (P&M) Division, NESPAK,
NESPAK House, 1-C, Block N, Model Town Extension, Lahore.
Telephone: 042-99231937
Fax: 042-99231936
E-Mail: sktlnespak@gmail.com

or any other competent person appointed by the Employer except for any of the Employer's personnel, and notified to the Contractor, to act in replacement of the Engineer. Provided always that except in cases of professional misconduct, the outgoing Engineers is to formulate his certifications/recommendations in relation to all outstanding matters, disputes and claims relating to the execution of the Works during his tenure.

The following paragraph is added:

(a)(vi) "Bidder or Tenderer" means any person or persons, company, corporation, firm or joint venture submitting a Bid or Tender.

(b)(v) The following text is added at the end of the paragraph:

The word "Tender" is synonymous with "Bid" and the word "Tender Documents" with "Bidding Documents".

The following paragraph is added:

(b)(ix) "Programme" means the programme to be submitted by the Contractor in accordance with Sub-Clause 14.1 and any approved revisions thereto.

(e)(i) The text of Sub-Clause 1.1(e)(i) is deleted and substituted with the following:

"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 there from as may be made and remedying of any defects therein in accordance with the provisions of the Contract.

The following definitions are added after item (g):

(h) "Biodiversity Action Plan" or BAP means a biodiversity action plan for 500kV Double Circuit Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station

(i) "Environmental Management Plan" or EMP means the environmental management plan for the site, including any update thereto, incorporated in the Environmental Impact Assessment (EIA).

(j) "Environmental Impact Assessment" or EIA means the environmental impact assessment for the site, including any update thereto, prepared and submitted by the Employer.

(k) "Land Acquisition and Resettlement Plan" or LARP means the land acquisition and resettlement plan for the site or a section thereof, including any update thereto, prepared by the Employer. "Resettlement Plan" or RP means the land acquisition and resettlement plan for the site or a section thereof, including any update thereto, prepared by the Employer.

(l) "Section" means any geographic part of the site, smaller than the site. The site may have several sections.

(m) "Semi-annual safeguards monitoring report" or SSMR means the report prepared by Employer on a bi-annual basis and verified by an external monitoring expert to provide an update on overall progress in social safeguards implementation at the project level, including the status of land acquisition and resettlement implementation progress, site handover status and need for corrective actions (if any).

2.1 Engineer's Duties and Authority

The Engineer shall obtain the specific approval of the Employer before carrying out his duties in accordance with the following Clauses:

(i) Consenting to the sub-letting of any part of the Works under Sub-Clause 4.1 "Subcontracting".

(ii) Certifying additional cost determined under Sub-Clause 12.2 "Not Foreseeable Physical Obstructions or Conditions".

(iii) Any action under Clause 10 "Performance Security" and Clauses 21, 23, 24 & 25 "Insurance" of sorts.

(iv) Any action under Clause 40 "Suspension".

(v) Any action under Clause 44 "Extension of Time for Completion".

(vi) Any action under Clause 47 "Liquidated Damages for Delay" or Payment of Bonus for Early Completion of Works (PCC Sub-Clause 47.3).

(vii) Issuance of "Taking over Certificate" under Clause 48.

(viii) Issuing a Variation Order under Clause 51, except:

a) in an emergency* situation, as stated here below, or

b) if such variation would increase the Contract Price by less than the amount stated in the Appendix-A to Bid.

(ix) Fixing rates or prices under Clause 52.

(x) Extra payment as a result of Contractor's claims under Clause 53.

(xi) Release of Retention Money to the Contractor under Sub-Clause 60.3 "Payment of Retention Money".

(xii) Issuance of "Final Payment Certificate" under Sub-Clause 60.8.

(xiii) Issuance of "Defect Liability Certificate" under Sub-Clause 62.1.

(xiv) Any change in the ratios of Contract currency proportions and payments thereof under Clause 72 "Currency and Rate of Exchange".

(Note: Employer may further vary according to need of the project)

* (If in the opinion of the Engineer an emergency occurs affecting the safety of life or of the Works or of adjoining property, the Engineer may, without relieving the Contractor of any of his duties and responsibilities under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forthwith comply with any such instruction of the Engineer. The Engineer shall determine an addition to the Contract Price, in respect of such instruction, in accordance with Clause 52 and shall notify the Contractor accordingly, with a copy to the Employer.)

2.3 Engineer's Authority to delegate:

The following paragraph is added:

The Chief Engineer (EHV-I) North NGC shall act as representative of Engineer for providing in house Engineering Services including but not limited to the following:

a) Review & approval of technical data/ drawings/design
b) Interpretation of the bidding documents
c) Review & approval of profile/plan tabling/route plan
d) Foundation designs, review and approvals
e) Site visits for attending any technical problem if necessary
f) Resolution of disputes
g) Review & approval of all technical matters

The following Sub-Clauses 2.7 and 2.8 are added:

2.7 Engineer Not Liable

Approval, reviews and inspection by the Engineer of any part of the Works does not relieve the Contractor from his sole responsibility and liability for the supply of materials, plant and equipment for construction of the Works and their parts in accordance with the Contract and neither the Engineer's authority to act nor any decision made by him in good faith as provided for under the Contract whether to exercise or not to exercise such authority shall give rise to

any duty or responsibility of the Engineer to the Contractor, any Subcontractor, any of their representatives or employees or any other person performing any portion of the Works.

2.8Replacement of the Engineer

If the Employer intends to replace the Engineer, the Employer shall, not less than 14 days before the intended date of replacement, give notice to the Contractor, of the name, address and relevant experience of the intended replacement Engineer. The Employer shall not replace the Engineer with a person against whom the Contractor raises reasonable objection by notice to the Employer, with supporting particulars.

5.1Language(s) and Law

(a) The Contract Documents shall be drawn up in the English language.
(b) The Contract shall be subject to the Laws of Islamic Republic of Pakistan.

5.2 Priority of Contract Documents

The documents listed at (1) to (6) of the Sub-Clause are deleted and substituted with the following:

(1) The Contract Agreement (if completed);
(2) The Letter of Acceptance;
(3) The completed Form of Bid;
(4) Special Stipulations (Appendix-A to Bid);
(5) The Particular Conditions of Contract (Part-II);
(6) The General Conditions (Part-I);
(7) The priced Bill of Quantities;
(8) The completed Appendices to Bid;
(9) The Specifications
(10) The Drawings;

All Drawings and Specifications shall be interpreted in conformity with the Contract and these Conditions. Addendum, if any, shall be deemed to have been incorporated at the appropriate places in the documents forming the Contract. If any ambiguity or discrepancy is found in the documents, the Engineer shall issue any necessary clarification or instruction which shall be binding.

The Contractor shall be responsible for providing free of charge thirteen (13) nos. copies of the Contract Agreement. The documents shall be arranged in the aforementioned sequence and provided to Employer within 10 days of signing of Contract Agreement.

6.1 Custody and supply of Drawings & Documents

The following text is added at the end of Sub-Clause 6.1:

The contractor shall supply a soft copy of such drawings in source file and any other format specified by the Engineer.

The following Sub-Clauses 6.6 and 6.7 are added:

6.6 Shop Drawings

The Contractor shall submit to the Engineer for review three (03) copies of all shop and erection drawings applicable to this Contract as per provision of relevant Sub-Clause of the Contract.

Review and approval by the 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 Engineer's review or approval shall not relieve the Contractor of any of his responsibilities under the Contract.

6.7 As-Built Drawings

At the completion of the Works under the Contract, the Contractor shall furnish to the Engineer 6 copies and one reproducible of all drawings amended to conform to the Works as built. The price of such Drawings shall be deemed to be included in the Contract Price.

10.1 Performance Security

The text is deleted and substituted with the following:

The Contractor shall provide Performance Security to the Employer in the prescribed form. The said Security shall be furnished or caused to be furnished by the Contractor within 14 days after the receipt of the Letter of Acceptance. The Performance Security shall be of an amount equal to 10% of the Contract Price stated in the Letter of Acceptance. Such Security shall, at the option of the bidder, be in the form of bank guarantee from any Scheduled Bank in Pakistan. The cost of complying with requirements of this Sub-Clause shall be borne by the Contractor.

The following Sub-Clause 10.4 is added:

10.4 Performance Security Binding on Variations and Changes

Performance Security shall remain valid and applicable as interpreted from the conditions of Contract and amendments on account of time/scope/cost/quality variations. Further, In case of a change in Contract Price by a factor of more than 15% on account of reasons stipulated in Clause-55 of Conditions of Contract, the Performance Security shall be liable for revision.

11.1 Inspection of Site

The text of Sub-Clause 11.1 is replaced with the following text:

Bidder shall inspect the site, examine and obtain all information required and satisfy himself regarding matters and things such as access to site, communication, transport, right of way, the type and number of equipment and facilities required for the satisfactory completion of work, the quantity of various sections of the work, the availability of local labour, availability and rates of materials, local working conditions, uncertainties of weather, obstructions and hindrances that may arise etc., which may affect the work or cost thereof, before submission of his bid. Ignorance of site conditions shall not be accepted by the Employer as basis for any compensation claim. The submission of a bid by the bidder will be construed as evidence that such an examination was made and any later claims/disputes in regard to rates quoted shall not be entertained or considered by the Employer.

If any temporary feeder road within site is considered essential for the proper execution of the work this shall have to be formed by the Contractor at his own cost with the prior approval of the Engineer. The Contractor shall organize his own arrangement to transport his equipment, staff, crews and materials in such a manner that the completion period will not be exceeded on any account.

The rates quoted by Bidder shall be based on his own knowledge and judgement of the conditions and hazards involved and shall not be based on any representations to the Engineer.

The following Sub-Clauses 12.3 and 12.4 are added after Sub-Clause 12.2:

12.3 Unforeseeable environment or resettlement risks or impacts

In addition to any of the not foreseeable physical obstructions or conditions noted in Sub-Clause 12.2, the Contractor shall provide the Engineer with a written notice of any unanticipated environmental or resettlement risks or impacts that arise during construction, implementation or operation of the Plant or the Works, which were not considered in the environmental impact assessment, the biodiversity action plan, the environmental management plan or the resettlement plan attached hereto.

12.4 The Contractor shall comply with (i) the measures and requirements relevant to the Contractor which are set forth in the Resettlement Plan (RP) attached hereto, to the extent it concerns impacts on affected people during construction, and (ii) any corrective or preventative actions set out in safeguards monitoring reports that the Employer will prepare from time to time to monitor the implementation of the resettlement plan.

14.1 Programme to be submitted

The Contractor shall submit a detailed time programme to the Engineer within 28 days after receipt of Letter of Acceptance.

The Contractor shall also submit a revised programme whenever the previousprogramme is inconsistent with actual progress or with the Contractor's obligations.

Each programme shall be in the form of bar chart or a CPM chart identifying the critical activities and include:

a) The order in which the Contractor intends to carry out the Works, including the anticipated timing of each stage of design (if any), Contractor's Documents, procurement, delivery to Site, construction, erection and testing.

b) Each of these stages for work by each nominated subcontractor

c) The sequence and timing of site inspections and tests specified in the Contract, and a supporting report which includes:

   i) A general description of the methods which the Contractor intends to adopt, and of the major stages, in the execution of the Works, and

   ii) Details showing the Contractor's reasonable estimate of the number of each class of

Contractor's Personnel and of each type of Contractor's Equipment, required on the Site for each major stage.

Unless the Engineer, within 14 days after receiving a programme, gives notice to the Contractor stating the extent to which it does not comply with the Contract, the Contractor shall proceed in accordance with the programme, subject to his other obligations under the Contract. The Employer's Personnel shall be entitled to rely upon the programme when planning their activities.

If, at any time, the Engineer gives notice to the Contractor that a programme fails (to the extent stated) to comply with the Contract or to be consistent with actual progress and the Contractor's stated intentions, the Contractor shall submit a revised programme to the Engineer in accordance with this Sub-Clause.

The period between the Program updates will be 30 days. If the contractor fails to submit an updated program in time, any payment due for his current bills will be withheld till the submission of such programme.

14.3 Cash Flow Estimate to be submitted

The detailed Cash Flow Estimate shall be submitted within 21 days from the date of receipt of Letter of Acceptance

The following Sub-Clause 14.5 is added:

14.5 Monthly Progress Report

During the period of the Contract, the Contractor shall submit to the Engineer not later than the 5th day of the following month, copies of Monthly Progress Reports covering:

(1) A Construction Schedule indicating the monthly progress in percentage;
(2) Description of all work carried out since the last report;
(3) Description of the work planned for the next 56 days sufficiently detailed to enable the Engineer to determine his programme of inspection and testing;
(4) Monthly summary of daily job record;
(5) Photographs to illustrate the status of progress on the Site.
(6) Information about problems and difficulties encountered, if any, and proposals to overcome the same.
(7) Charts and detailed descriptions of progress, including each stage of design (if any), Contractor's Documents, delivery of material to Site, construction, erection and testing; and including these stages for work by each nominated Subcontractor.
(8) The details described in Sub-Clause 35.1 [Return of labor & Contractor's Equipment]
(9) Copies of quality assurance documents, test results and certificates of Materials.
(10) List of notices given under Sub-Clause 68.1[Notice to Contractor] and notices given under Sub-Clause 68.2[Notice to Employer & Engineer].
(11) Safety statistics, including details of any hazardous incidents and activities relating to environmental aspects and public relations.
(12) EIA, BAP and Social Safeguards Implementation and Monitoring **on monthly basis**
(13) EIA, BAP and Social Safeguards Implementation and Monitoring report **on semi-annual basis**

(14) Comparisons of actual and planned progress, with details of any events or circumstances which may jeopardize the completion in accordance\ with the Contract, and the measures being (or to be) adopted to overcome delays.

These progress reports will be submitted as per the following distribution list:

(1) G.M PD/GSC (North), NGC
(2) G.M (P&CM) NGC
(3) CE (MP&M), NGC
(4) CE (EHV-I) North, NGC
(5) CE (T/L Design), NGC
(6) PD (EHV-I) NGC Concerned
(7) XEN (EHV-I) NGC Concerned
(8) Project Manager, NESPAK
(9) Construction Manager, NESPAK

During the period of the Contract, the Contractor shall keep a daily record of the work progress, which shall be made available to the Engineer as and when requested. The daily record shall include particulars of weather conditions, number of men working, deliveries of materials, quantity, location and assignment of Contractor's equipment.

The following Sub-Clause 14.6 is added:

14.6 Contract Management Plan

The detailed reporting requirements are presented in the Contract Management Plan (CMP) template, attached herewith. The Contractor, the Employer and Engineer will use a dedicated web-based dashboard system for reporting, which will be based on the CMP structure. The system is provided free of charge by the Employer. The Contractor will submit a monthly report to the Employer using web-based project monitoring software to create & submit the monthly report through the web-based dashboard system.

15.1 Contractor's Superintendence

The following text is added at the end of Sub-Clause 15.1:

The Contractor's authorised representative and his other professional engineers working at Site shall register themselves with the Pakistan Engineering Council.

The Contractor's authorized representative at Site shall be authorized to exercise adequate administrative and financial powers on behalf of the Contractor so as to achieve completion of the Works as per the Contract.

The following Sub-Clauses 15.2 is added:

15.2 Language Ability of Contractor's Representative

The Contractor's authorized representative shall be fluent in the English language. Alternately an interpreter with ability of English language shall be provided by the Contractor on full time basis.

The following Sub-Clauses 16.3 and 16.4 are added:

16.3 Language Ability of Superintending Staff of Contractor

A reasonable proportion of the Contractor's superintending staff shall have a working knowledge of the English language. If the Contractor's superintending staffs is not fluent in English language, the Contractor shall make competent interpreters available during all working hours in a number deemed sufficient by the Engineer.

16.4 Employment of Local Personnel

The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labour from sources within Pakistan.

The following Sub-Clauses 19.3 and 19.4 are added:

19.3 Safety Precautions

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 Engineer may authorise or direct and the Contractor shall take or cause to be taken such further measures and comply with such further requirements as the Engineer may determine to be reasonably necessary for such purpose.

The Contractor shall make, maintain and submit reports to the Engineer concerning safety, health and welfare of persons and damage to property, as the Engineer may from time to time prescribe.

19.4 Lighting Work at Night

In the event of work being carried out at night, the Contractor shall at his own cost, provide and maintain such good and sufficient light as will enable the work to proceed satisfactorily and without danger. The approaches to the Site and the Works where the night-work is being carried out shall be sufficiently lighted. All arrangement adopted for such lighting shall be to the satisfaction of the Engineer's Representative.

The following Sub-Clauses 19.5, 19.6, 19.7 and 19.8 are added:

19.5 Protection of the Environment

(i) The Contractor shall comply with all applicable national, provincial, and local environmental laws and regulations.

(ii) The Contractor shall (a) establish an operational system for managing environmental impacts, (b) carry out all of the monitoring and mitigation measures relevant to the Contractor set forth in [Environmental Impact Assessment] [the Environmental Management Plan] [Biodiversity Action Plan] attached hereto and (c) allocate a budget to ensure that such measures are carried out. The Contractor shall submit

quarterly reports on the carrying out of such measures to the Employer.

(iii) More particularly, the Contractor shall comply with (i) the measures and requirements set forth in the EIA and the EMP attached hereto; and (ii) any corrective or preventative actions set out in safeguards monitoring reports that the Employer will prepare from time to time to monitor implementation of the EIA and the EMP.

(iv) The Contractor shall allocate a budget for compliance with these measures, requirements and actions.

19.6 Environmental Safeguards

Contractor(s) shall ensure that:

(a) A Site Environment Expert (also mentioned in key personnel list) is appointed with relevant educational background and experience within 28 days of the Effective Date. The CVs of the applicants for the position should be shared with the Employer for approval;
(b) Site Specific EMP, Waste Management Plan and Environmental Management & Monitoring Plan (EMMP) implementation plan including COVID-19 risk assessment shall be submitted to the Employer for approval before mobilization to Site;
(c) The EMP is implemented in all aspects;
(d) The BAP is implemented in all aspects;
(e) All mitigation and monitoring measures identified in the EIA, BAP, and EMMP are incorporated in detailed design and implemented during construction/operation of the Project Facilities;
(f) All subcontracts under the project shall contain provisions complying with this paragraph (d);
(g) Sufficient budget is made available for all such environmental and social measures mentioned in this paragraph (d);
(h) The Employer is provided with a written notice of any unanticipated environmental, resettlement or indigenous people's risks or impacts that arise during construction, implementation or operation of project that were not considered in the EIA/IEE or the LARP/RAP;
(i) Tree plantation is carried out in accordance with the Environmental Approval obtained from respective environmental protection agency (EPA) and in accordance with the aesthetic value of the area before issuance of completion certificate;
(j) All invoices/amounts claimed by contractor(s) in lieu of Environment & Social Safeguards Management would be sent to the Employer for verification;
(k) Monthly and quarterly monitoring & implementation reports are submitted to the Employer in the form agreed with the Employer;
(l) Personal protective equipment (safety helmets, hard helmets, safety gloves, safety shoes, safety glasses, safety vests etc.) are provided by the Contractor to all the workers at Site before commencement of the relevant works;
(m) Safety signs and awareness material printed in Urdu & English languages (4 x 6 feet Panaflexes) are placed & visible at project Site;
(n) Pathways, 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 fully restored to at least pre-project condition upon the completion of construction works;
(o) Proper sanitation facilities and clean drinking water are provided to anyone working on Site;

(p) Water tests, air quality monitoring, noise measurement are conducted on quarterly basis by EPA approved lab (NOC for selected lab must be issued by the Employer before conducting tests) and records provided to the Employer;

(q) All conditions set forth in an Environmental approval/NOC issued by respective environmental protection agency (EPA) are complied with; and

(r) Upon completion of construction works, the Contractor shall restore all affected lands to its pre-work conditions or better, before returning lands to affected persons to be verified by a project completion/safeguard monitoring report.

19.7 Land Acquisition and Resettlement

The contractor(s) will ensure that all applicable laws and regulations of Pakistan relating to (a) Land acquisition and involuntary resettlement; (b) Involuntary Resettlement Safeguards; and (c) all measures and requirements set forth in the respective LARP, and any corrective or preventative actions set forth in a Safeguards Monitoring Report and strictly adhered to and ensure that:

(a) A Social Safeguards Expert (also mentioned in key personnel list) is appointed with relevant educational background and experience; and

(b) Support Employer in RP updation and to ensure that Resettlement Action Plan (RAP) is fully implemented before start of civil works and issuance of Notice to Proceed.

19.8 Safeguards

(a) Information at worksites on risks of sexually transmitted diseases and HIV/AIDS is disseminated for those employed during construction, and take measures to protect workers from protect workers from potential exposure to sexually transmitted diseases;

(b) There is no differentiation between men and women wages or benefits for work of equal value;

(c) It abstains from child labor; and

(d) The Contractor (where possible) shall employ in the project construction works, the interested members of project affected households that are identified as vulnerable and/or severely affected by involuntary resettlement impact of the project, as feasible based on required skills. The Project Manager shall provide to the Contractor(s) the list of work-able persons from the identified vulnerable and severely affected households interested in employment in the project works.

21.1 Insurance of Works and Contractor's Equipment

The following is added at the end of Sub-Clause 21.1(a):

(i) For Cost of Plant
Lot-I: 7,792 Million PKR

(ii) For the Works together with Material: Full value of material

Following is added at the end of Sub-Clause 21.1(c):

(d) For loss or damage to property (except the Works, Materials, and Equipment) in connection with the Contract: Full value of loss/damage to property

(e) For personal injury or death:
i) of the Contractor's employees: Following such applicable laws in Pakistan
ii) of other people: Following such applicable laws in Pakistan

25.1 Evidence and Terms of Insurance Covers

In line 03, the text "within 84 days" is replaced with "prior to".

In line-04 of paragraph-1, the words "including premium payment plan and Paid Premium Receipts (PPRs)" are added after words "To the Employer".

25.4 Compliance with Policy Conditions

Delete the text and substitute with the following:

"In the event that the Contractor fails to comply with conditions imposed by the insurance policies affected pursuant to the contract, the Contractor shall indemnify the employer against all losses and claims arising from such failure."

The following Sub-Clause 25.5 is added:

25.5 Insurance Company

The Contractor shall be obliged to place all insurances relating to the Contract (including, but not limited to, the insurances referred to in Clauses 21, 23 and 24) with either National Insurance Company of Pakistan or any other insurance company operating in Pakistan and acceptable to the Employer.

Costs of such insurances shall be borne by the Contractor.

The Contractor shall procure and submit the insurance cover before Date of Commencement. In case of failure, the contractor shall be fully responsible for any event and loss and shall indemnify as per insurance cover to be arranged. Furthermore, the Employer also reserves the right to procure the insurance policies at risk and cost of the Contractor.

The following Sub-Clause 30.5 is added:

30.5 Transport of Goods

The Contractor shall adequately record the condition of roads, agricultural land and other infrastructure prior to the start of transporting materials, goods and equipment, and construction.

The following Sub-Clause 31.3 is added:

31.3 Co-operation with other Contractors

During the execution of the Works, the Contractor shall co-operate fully with other contractors working for the Employer at and in the vicinity of the Site and also shall provide

adequate precautionary facilities not to make himself a nuisance to local residents and other contractors.

The following Sub-Clause 33.2 is added:

33.2 Cost of Remedying Defects

Upon the completion of construction, the Contractor shall fully reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition as recorded by the Contractor in consonance with its obligations in Sub-Clause 30.5.

The following Sub-Clauses 34.2 to 34.17 are added:

34.2 Rates of Wages and Conditions of Labour

The Contractor shall pay rates of' wages and observe conditions of labour not less favourable than those established for the trade or industry where the work is carried out. In the absence of any rates of wages or conditions of labour so established, the Contractor shall pay rates of wages and observe conditions of labour which are not less favourable than the general level of wages and conditions observed by other employers whose general circumstances in the trade or in industry in which the Contractor is engaged are similar.

34.3 Employment of Persons in the Service of Others

The Contractor shall not recruit his staff and labour from amongst the persons in the services of the Employer or the Engineer; except with the prior written consent of the Employer or the Engineer, as the case may be.

34.4 Housing for Labour

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 Engineer.

34.5 Health and Safety

Due precautions shall be taken by the Contractor, and at his own cost, to ensure the health and safety of his staff and labour at all times throughout the period of the Contract and to provide a safe work environment. The Contractor shall further ensure that suitable arrangements are made for the prevention of epidemics and for all necessary welfare and hygiene requirements. The Contractor shall conduct health and safety programs for workers employed under the project and shall include information on the trafficking of women and the risk of sexually transmitted diseases, including HIV/AIDs in such programs.

34.6 Epidemics

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.

34.7 Supply of Water

The Contractor shall, so far as is reasonably practicable, having regard to local conditions, provide on the Site, to the satisfaction of the Engineer or his representative, adequate supply of drinking and other water for the use of his staff and labour.

34.8 Alcoholic Liquor or Drugs

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, staff or labour.

34.9 Arms and Ammunition

The Contractor shall not give, or otherwise dispose of to any person or persons, any arms or ammunition of any kind or permit or suffer the same as aforesaid.

34.10 Festivals and Religious Customs

The Contractor shall in all dealings with his staff and labour have due regard to all recognised festivals, days of rest and religious and other customs.

34.11 Disorderly Conduct

The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst staff and labour and for the preservation of peace and protection of persons and property in the neighbourhood of the Works against the same.

34.12 Compliance by Subcontractors

The Contractor shall be responsible for compliance by his Subcontractors of the provisions of this Clause.

34.13 Prohibition of Harmful Child Labour

The Contractor shall not employ any child to perform any work, including work that is economically exploitative, or is likely to be hazardous to, or interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral or social development. "Child" means a child below the statutory minimum age of 14 specified under the laws of Pakistan

34.14 Prohibition of Forced or Compulsory Labour

The Contractor shall not employ forced labour, which consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty, and includes any kind of involuntary or compulsory labour, such as indentured labour, bonded labour or similar labour-contracting arrangements.

34.15 Labour Laws

The Contractor shall not make employment decisions based upon personal characteristics unrelated to job requirements. The Contractor shall base the employment relationship upon equal opportunity and fair treatment, and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment or retirement and discipline. Where relevant labour laws are silent on nondiscrimination in employment, the Contractor shall meet this Sub-Clause's requirements. Special measures of protection or assistance to remedy past discrimination or selection for a particular job based on the inherent requirements of the job shall not be deemed discrimination.

34.16 Workers' Organizations

In countries where the relevant labour laws recognize workers' rights to form and to join workers' organisations of their choosing without interference and to bargain collectively, the Contractor shall comply with such laws. Where the relevant labour laws substantially restrict workers' organisations, the Contractor shall enable alternative means for the Contractor's Personnel to express their grievances and protect their rights regarding working conditions and terms of employment. In either case described above, and where the relevant labour laws are silent, the Contractor shall not discourage the Contractor's staff, consultants, contractors and agents (Contractor's Personnel) from forming or joining workers' organisations of their choosing or from bargaining collectively, and shall not discriminate or retaliate against the Contractor's Personnel who participate, or seek to participate, in such organisations and bargain collectively. The Contractor shall engage with such workers' representatives. Workers' organisations are expected to fairly represent the workers in the workforce.

34.17 Holidays and local laws

The Contractor shall, in all dealings with its labour and the labour of its Sub-Contractors currently employed on or connected with the Contract, pay due regard to all recognized festivals, official holidays, religious or other customs and all local laws and regulations pertaining to the employment of labour.

35.1 Returns of Labour and Contractor's Equipment

The text of Sub-Clause 35.1 is replaced with the following text:
The Contractor shall submit, to the Engineer, details showing the number of each class of Contractor's Personnel and of each type of Contractor's Equipment on the Site. Details shall be submitted each calendar month, in a form approved by the Engineer, until the Contractor has completed all work which is known to be outstanding at the completion date stated in the Taking Over Certificate for the Works.

The following Sub-Clauses 35.2 and 35.3 are added:

35.2 Records of Safety and Health

The Contractor shall maintain such records and make such reports concerning safety, health and welfare of persons and damage to property as the Engineer may from time to time prescribe.

35.3 Reporting of Accidents

The Contractor shall report to the 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, notify the Engineer immediately by the quickest available means.

The following Sub-Clause 36.6 is added:

36.6 Use of Pakistani Materials and Services

The Contractor shall, so far as may be consistent with the Contract, make the maximum use of materials, supplies, plant and equipment indigenous to or produced or fabricated in Pakistan and services, available in Pakistan provided such materials, supplies, plant, equipment and services shall be of required standard.

41.1 Commencement of Works

The text is deleted and substituted with the following:

The Contractor shall commence the Works on Site within the period named in Appendix-A to Bid. Thereafter, the Contractor shall proceed with the Works with due expedition and without delay.

Foundation Construction:

Site access to the whole site or parts (sections) for the sole purpose of **foundation construction** are based on the following steps being completed:

(1) In case of sectional approach, Contractor submits to the employer within 28 days of effective date:

   (i) Proposed parts (sections)
   (ii) A program that states:

      a) submission dates for the detailed design of each part (section)
      b) site access dates for each part (section)

(2) If using a sectional approach, submit the detailed design and final route of the transmission line to the employer for that section only

   If a sectional approach is not being utilized, submit the detailed design and final route of the transmission line to the employer.

(3) Utilizing the affected persons list and vouchers issued to the contractor (6 weeks after submission of detailed design and final route) by the employer, the contractor must pay affected persons and submit bank records (or where applicable, other documentation) within 3 weeks to the employer as proof of payment to affected persons

(4) The employer (7 weeks after receipt of contractor's verification documentation) will Issue a Notice to Proceed (NTP) to the Contactor to access the site or section of site for the purpose of **foundation construction only.**

Tower Erection:

Commencement of work to the whole site or parts (sections) for the sole purpose of **tower erection** are based on the following steps being completed:

(5) Employer will notify and or issue to the contractor (4 weeks after the foundations NTP):

a. Any residual LARP impact relating to construction of foundations and issue an affected persons list and vouchers. Utilizing the affected persons list and vouchers issued to the contractor by the employer, the contractor must pay affected persons and submit bank records (or where applicable, other documentation) within 3 weeks to the employer as proof of payment to affected persons

b. Issue a revised (based on impacts relating to tower erections) affected persons list and vouchers. The contractor must pay affected persons and submit bank records (or where applicable, other documentation) within 3 weeks to the employer as proof of payment to affected persons

(6) The employer (7 weeks after receipt of contractor's verification documentation) will Issue a Notice to Proceed (NTP) to the Contactor to commence construction activities related to **erection of towers only.**

Transmission Line Stringing:

Commencement of work to the whole site or parts (sections) for the sole purpose of **transmission line stringing** are based on the following steps being completed:

(7) Employer will notify and or issue to the contractor (4 weeks after the tower erection NTP):

a. Any residual LARP impact relating to erection of towers and issue an affected persons list and vouchers. Utilizing the affected persons list and vouchers issued to the contractor by the employer, the contractor must pay affected persons and submit bank records (or where applicable, other documentation) within 3 weeks to the employer as proof of payment to affected persons

b. Issue a revised (based on impacts relating to tower erections) affected persons list and vouchers. The contractor must pay affected persons and submit bank records (or where applicable, other documentation) within 3 weeks to the employer as proof of payment to affected persons

The employer (7 weeks after receipt of contractor's verification documentation) will Issue a Notice to Proceed (NTP) to the Contactor to commence construction activities related to **transmission line stringing**.

44.1 Extension of Time for Completion

Following text is added at the end of Sub-Clause 44.1:

within reasonable time but not later than 90 days after submission of interim/final particulars by the Contractor in pursuance of this Clause as per prevalent SoPs .

46.2 Progress Reports

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.

The following Sub-Clause 47.3 is added:

47.3 Bonus for Early Completion of Works

No bonus is admissible for the project.

49.2 Completion of Outstanding Works and Remedying Defects

The following sub-clause is included at end of existing text

c) Provide detailed Completion Report alongwith As built data/drawings, material reconciliation reports and Hard and Soft Copies of site records/data to the Engineer for information and approval prior to expiry of Defect Liability Period. One copy shall also be provided to Employer for reference.

d) Return balance/surplus materials to designated NGC warehouses as per material re-conciliation reports dully approved by the Engineer. All Coordination in allocation and handing over of material will be carried out through Employer of the Project.

The following Sub-Clause 49.5 is added:

49.5 Extensions of Defects Liability Period

The provisions of this Sub-Clause shall apply to all replacements or renewals of plant and equipment carried out by the Contractor to remedy defects and damage 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 a part of the Works is affected the Defects Liability Period shall be extended only for that part. In neither case shall the Defects Liability Period extend beyond two (2) years from the effective date of Taking Over Certificate.

51.1 Variations

Text of Sub-Clause 51.1 (a) is replaced with the following text:

(a) changes to the quantities of any item of work included in the Contract (however, such changes do not necessarily constitute a Variation if and to the extent that change is due to Clause 55.1 and 56.1),

51.2 Instructions for Variations

At the end of the first sentence, after the word “Engineer", the words “in writing “are added.

52.1 Valuation of Variations

In the tenth line, after the words “Engineer shall” the following is added:

Within a period not exceeding one-eighth of the completion time subject to a minimum of 56 days from the date of disagreement whichever is later.

54.5 Conditions of Hire of Contractor’s Equipment

The following paragraph is added:

The Contractor shall, upon request by the Engineer at any time in relation to any item of hired Contractor’s Equipment, forthwith notify the Engineer in writing the name and address of the Owner of the equipment and shall certify that the agreement for the hire thereof contains a provision in accordance with the requirements set forth above.

The following Sub-Clauses59.4 & 59.5 are added:

59.4 Payments to Nominated Subcontractors

The Contractor shall pay to the nominated Subcontractor the amounts which the Engineer certifies to be due in accordance with the subcontract. These amounts plus other charges shall be included in the Contract Price in accordance with Clause 58 [Provisional Sums], except as stated in Sub-Clause 59.5 [Certification of Payments].

60.1 Monthly Statements

In the first line after the word “shall”, the following is added:
“on the basis of the joint measurement of work done under Clause 56.1,”

In Para (c) the words “the Appendix to Tender” are deleted and substituted with the words “Sub-Cause 60.11 (a)(6) hereof”.
(in case Clause 60.11 is applicable)

The Last Paragraph starting from word “Notwithstanding” and ending with word “Employer” is deleted

60.2 Monthly Payments

In the first line, “28” is substituted by “14”.

Following text is added after the text "Performance Security" in last paragraph of Clause 60.2 "Issuance Policies and Advance Payment Guarantee":

60.3 Payment of Retention Money

a) The following text is added at the end:

"In addition to above, release of this retention money is subject to issuance of GRN/SRS by In charge of designated NGC Warehouse for balance material of the project as per material reconciliation report along with certification from In charge of the Warehouse of completeness and healthiness of the returned material. The Engineer of the Project shall duly vet the material reconciliation report as per the as-built profile of the project."

60.11 Financial Assistance to Contractor (Mobilization Advance)

Financial assistance shall be made available to the Contractor by the Employer by providing a Mobilization Advance in the following way:

(a) An interest-free Mobilization Advance of 10 % of the Contract Price stated in the Letter of Acceptance shall be paid by the Employer to the Contractor in two equal parts upon submission by the Contractor of a Mobilization Advance Guarantee/Bond for the full amount of the Advance in the specified form from a Scheduled Bank in Pakistan.

(1) First part within 14 days after signing of the Contract Agreement or date of receipt of Engineer's Notice to Commence, whichever is earlier; and

(2) Second part within 42 days from the date of payment of the first part, subject to the satisfaction of the Engineer as to the state of mobilization of the Contractor.

(b) The Contractor is to use the advance payment only to pay for Equipment, Plant, Materials, and mobilization expenses required specifically for execution of the Contract.

(c) The Mobilization Advance shall be adjusted through percentage deductions made at the rate of 10% of the amount of all Interim Payment Certificates until such time as the advance payment has been adjusted; provided that the advance payment shall be completely repaid to the time when 80% of the Contract Price has been certified for payment.

(d) In case the part of advance payment remains unadjusted before completion of works/issuance of Taking Over Certificate under Clause 48, the Contractor shall be bound to pay back the amount to the Employer within 28 days of receipt of notice from Employer. In case of non-receipt of payment, Employer has the right to recover from the balance payments due under the Contract including Retention Monies due under Clause 60.3.

(e) The Bank Guarantee will remain effective until the advance payment has been full set off. 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.

60.12 Employer's/Engineer's Right to withhold payments

a) Notwithstanding the terms of Clause 60.2 & 60.3 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 and Insurance Policies, 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 Clause 10.2, 60.12, 21, 23 and 24.

b) In case of Contractor's non-compliance with reporting requirements under Clause-46.2 and insurance requirements under Clause 20 of Conditions of Contract.

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.

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.

63.1 Default of Contractor

The following para is added at the end of the Sub-Clause:

Provided further that in addition to the action taken by the Employer against the Contractor under this Clause, the Employer may also refer the case of default of the Contractor to Pakistan Engineering Council for punitive action under the Construction and Operation of Engineering Works Bye-Laws 1987, as amended from time to time.

67. 3 Arbitration

In the sixth to eight lines, the words "shall be finally settled ……. appointed under such Rules" are deleted and substituted with the following:

shall be finally settled under the provisions of the Arbitration Act, 1940 as amended or any statutory modification or re-enactment thereof for the time being in force

The following paragraph is added:

The place of arbitration shall be Lahore, Pakistan.

68.1 Notices to Contractor

The following paragraph is added:

For the purposes of this Sub-Clause, 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.

68.2 Notices to Employer and Engineer

For the purposes of this Sub-Clause, the respective addresses are:

a) The Employer is:

Chief Engineer (MP&M), NGC,
8th Floor, Shaheen Complex,
Egerton Road, Lahore-Pakistan

Telephone No. 92-42-99202597
Fax No. 92-42-99202173
E-mail address: cempm@ntdc.com.pk

b) The Engineer is:

Designated representative of
represented by:

Power and Mechanical (P&M) Division NESPAK,
NESPAK House, 1-C, Block N, Model Town Extension, Lahore.
Telephone: 042-99231937
Fax: 042-99231936
E-Mail: sktlnespak@gmail.com

70.1 Increase or Decrease of Cost

The increase or decrease of Contract Price shall be determined following the Price Adjustment Formula given in Appendix-C to Bid of Section-III: Forms of Bid & Appendices.

72.2 Currency Proportions

Contract Price is quoted in Pakistani Rupee only and the Employer shall pay to the Contractor in Pakistani Rupee.

The following Sub-Clauses 73.1, 73.2, 74.1, 75.1, 76.1, 77.1 and 78.1 are added:

73.1 Payment of Income Tax

The Contractor, Subcontractors and their employees shall be responsible for payment of all their income tax, super tax and other taxes on income arising out of the Contract and the rates and prices stated in the Contract shall be deemed to cover all such taxes.

73.2 Customs Duty & Taxes
Provincial Sales Tax

Contractor will submit the invoice inclusive of Provincial Sales Tax. Provincial Sales Tax shall be charged by the contractor and payments will be subject to income tax and sales tax withholding as per Rules mentioned in Federal or Respective Provincial Laws only to those entities appearing in Active Taxpayer list (ATL) for both, the contractor will provide income and Sales Tax Copy of sales tax return. In case of non-registration with the relevant provincial authority, the tax will be deducted from the amount due or to be due to the contractor.

74.1 Integrity Pact and ADB Integrity Covenant

If the Contractor or any of his Subcontractors, agents or servants is found to have violated or involved in violation of the Integrity Pact and ADB Integrity Covenant signed by the Contractor as Appendix-O to the Bid, then the Employer shall be entitled to:

(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;
(b) terminate the Contract; and

(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.

The termination under Sub-Para (b) of this Sub-Clause shall proceed in the manner prescribed under Sub-Clauses 63.1 to 63.4 and the payment under Sub-Clause 63.3 shall be made after having deducted the amounts due to the Employer under Sub-Para (a) and (c) of this Sub-Clause.

75.1 Termination of Contract for Employer's Convenience

The Employer shall be entitled to terminate the Contract at any time for the Employer's convenience after giving 56 days prior notice to the Contractor, with a copy to the Engineer. In the event of such termination, the Contractor:

(a) shall proceed as provided in Sub-Clause 65.7 hereof; and
(b) shall be paid by the Employer as provided in Sub-Clause 65.8 hereof.

76.1 Liability of Contractor

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 assigns and the labour employed by them.

77.1 Joint and Several Liabilities

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.

78.1 Details to be Confidential

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 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 Engineer whose award shall be final.

SECTION VI

SPECIFICATIONS - SPECIAL PROVISIONS

SP-01 ACQUAINTANCE WITH THE SITE

The Contractor shall be deemed to have inspected and examined the Site and its surroundings and information available in connection therewith and before submitting his Bid, as to the form and nature thereof, including the subsurface conditions, the hydrological and climatic conditions, the extent and nature of Works for completion, the means of access to the Site and the accommodation he may require and, in general, shall be deemed to have obtained all necessary information, subject as above mentioned, as to risks, contingencies and all other circumstances which may influence or affect his Contract.

SP-02 DESCRIPTION OF PROJECT

Suki Kinari HPP is being constructed in the Northern area of Pakistan. For the dispersal of the power generated by this Power Plant, a 500kV D/C Quad Bundle Transmission Line from Suki Kinari HPP to the 500kV Maira Switching Station is being constructed. This transmission line is divided into two segments. The first segment is the construction of a 500kV D/C Quad Bundle Transmission Line from Suki Kinari HPP to Sangal, which is under the scope of work of another project. Whereas, the construction of a 500kV D/C Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station (approx. 83km), the scope of work under this Project comprise Lot-I of the said transmission line only, as detailed below. This transmission line will be constructed through NGC's resources following the Bidding Documents.

Lot-I: 500kV Double Circuit Quad Bundle Transmission Line from Tower No. 01 Near Sangal to Tower No. 69 Near Potha Sharif (23.5 km)

The Line shall be of Quad bundle ACSR “Bunting” conductor per phase having one OPGW and one Aluminum Clad Steel Shield Wire on the tower peaks.

Route alignment, detailed survey, plan & profile drawings, and construction structure lists of the proposed Transmission Line have already been prepared by the Employer and will be provided to the successful Bidder at the time of the Award of the Contract.

SP-02.1 Location of Project

Suki Kinari Hydro Power Plant is installed in Khyber Pakhtunkhwa (KPK) Province of Pakistan. The route passes through the mountainous, hilly, and partly forest-covered area of Punjab Province.

SP-03 SITE CONDITIONS

SP-03.1 Site Conditions and Meteorological Data

The Employer does not guarantee the correctness of any data provided herein nor any interpretations, deductions, or conclusions relative to subsurface conditions at the Site. The Contractor must form his own opinion of the character and type of materials to be excavated. He must make his interpretations, and satisfy himself by his investigations and research regarding all conditions works. The Contractor must

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.

SP-04 WORKS

SP-04.1 Works

The intent of these Specifications is that the Works under this Contract should be equal to or superior to those described herein. In choosing indigenous materials and their finishes due regard shall be given to the conditions prevailing at the Site.

SP-04.2 Extent of Specifications

The extent of the Bidding Documents is to provide for the Works herein specified to be fully complete in every detail for the function designated. All Works which are not specifically mentioned in the Bidding Documents, but which, in the opinion of the Engineer, are usual or necessary for the satisfactory completion of the Works shall be deemed to be included in the Contract Documents and shall be provided by the Contractor without extra cost to Employer.

SP-05 WORKS BY CONTRACTOR

SP-05.1 Scope

The scope of Works includes but is not limited to insurance, loading at Employer's Storage Yard at NGC Warehouses [NGC Warehouse New KotLakhpat for Stubs; NGC Warehouse Moro for Steel Tower Material; NGC Warehouse Rawat for Conductor and NGC Warehouse Multan for Disc Insulators, Hardware Material and Dampers], transportation, and unloading of the material provided by the Employer i.e. steel towers including stubs angles for foundations, conductor, and OPGW along with associated equipment, conductor, Shield Wire & OPGW accessories and dampers, fog type disc insulators along with associated hardware, grounding materials, delivering to site and storing thereof, its installation and all other Works required to construct, complete and commission the 500kV Double Circuit Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station as per following scope of work.

Lot-I: 500kV Double Circuit Quad Bundle Transmission Line from Tower No. 01 Near Sangal to Tower No. 69 Near Potha Sharif (23.5 km)

The line to be constructed under these Specifications is 3-phase per circuit on Double Circuit towers. The Line shall be of Quad bundle ACSR "Bunting" conductor per phase having one OPGW and one Aluminum Clad Steel Shield Wire on the peaks.

The Works to be performed under these Specifications are based on the rates provided in the Bill of Quantities and include but are not limited to the following:

i) Provision of all guarantees, insurances, field offices/camps, storage camps, labour, services, Plant and Contractor's tools and equipment (including tension stringing and construction equipment) to construct, complete, test, and commission the said transmission line following the requirements of the Contract Documents.
ii) Prepare and furnish all drawings and documents.
iii) Clearing right-of-way including disposal of cleared materials.

iv) Check Survey including pegging out and layout of tower locations, spotting / staking of towers, tower spotting adjustment, etc.
v) Establishing route alignment of any diversion required and detailed survey not limited to chainage & levelling.
vi) Sub-soil investigation along the line Route (only diverted portion) including laboratory tests and preparation & submission of sub-soil investigation reports along with design & recommendations for the type of foundations of towers required for any diversion necessitated.
vii) Preparation of plan & profile drawings (only diverted portion), tower spotting, etc.
viii) Preparation of construction structure lists and construction drawings.
ix) Surveying of tower sites, tower staking, tower contouring tower spotting adjustment, and establishing correct locations of footings.
x) Excavation, formation of ramps, grading, blasting, levelling, cutting, and backfilling including disposal of surplus/excavated material.
xi) Furnishing materials at the site for constructing reinforced concrete tower foundations including installation of steel stub angles and tower grounding.
xii) Ground assembly of tower sections and erection of steel towers.
xiii) Installing insulator assemblies for conductors.
xiv) Stringing conductors, overhead shield wire, and OPGW complete with hardware, accessories, and dampers.
xv) Furnishing and installing tower signs (Aerial Markers, Danger Signs, Number, and Phase Plates, etc.), and anti-climbing devices.
xvi) Latitude and Longitude by hand-held GPS of each tower location.
xvii) Testing and commissioning of the aforesaid Transmission Line.
xviii) Design and construction of access roads, and cable car/ropeway.
xix) The Contractor will provide the security arrangements for his own crews/staff/storage yards.
xx) Preparation & submission of monthly progress reports including site photographs, as-built data, and drawings including copies of reproducible transparencies and computer USB drives using AutoCAD.
xxi) Welding of bolts and Painting of tower stub/tower member/plates/bolts or repair of the already painted tower as advised by the Engineer.
xxii) Preparation of complete As-Built profile by the contractor. The As-Built profile shall be vetted by the Engineer and will be submitted to the concerned NGC formations.
xxiii) Preparation of Material Reconciliation Report as per As-Built profile.
xxiv) Construction of Retaining wall/Gravel Blanket/Gabion.
xxv) Any other activity specifically not covered in the scope of work but required for the completion, testing & commissioning, and operation of the overhead line shall be deemed to be included in the scope of work.

NOTE:

(1) The Contractor is responsible for mobilizing sufficient numbers of crews for foundations, tower erection, stringing, etc. equipped with T&P complete in all respects for smooth execution of each activity. For timely completion of the Project, the Contractor is responsible for adhering to the project schedule and ensuring that sufficient resources are available with the crews before the commencement of each activity. Detailed methodology and list of T&P shall have to be approved by the Engineer well before the commencement of each

activity. The details of construction equipment/T&P to be arranged/imported from abroad by the Contractor must be furnished in his Bid.

(2) In case the Contractor fails to arrange the required numbers of crews along with requisite T&P in good working condition for inspection at the site before commencement of the respective activity, the Employer has the right, in addition to withholding current payments, to terminate the Contract at any stage and to get executed the balance work through other Contractors at the Contractor's risk and cost.

SP-06 DRAWINGS

SP-06.1 Drawings in Contract

SP-06.1.1 Specification Drawings

The specification drawings contained in Volume II of the Contract Documents show the Specifications and Scope of Works to be performed by the Contractor.

SP-06.1.2 Contractor's Bid Drawings

The Contractor's bid drawings are the drawings prepared by the Contractor for bidding purposes and shall be part of his Bid.

The specification drawings and the Contractor's bid drawings shall not be used for the execution of the Works unless specific instructions for such use are given by the Engineer.

SP-06.1.3 Approved Drawings

The Works shall be performed in accordance with the approved drawings.

SP-06.2 Drawings and Other Data to be furnished by the Contractor

All drawings shall be in English language and all dimensions shall be in Metric System. Symbols shall be following IEC standards. All drawings shall be marked "National Grid Company of Pakistan Limited (NGC) for Construction and Completion of Civil Works, Erection, Stringing, Testing & Commissioning of 500kV D/C Quad Bundle Transmission Line for 500kV Double Circuit Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station as per the following scope of work:

Lot-I: 500kV Double Circuit Quad Bundle Transmission Line from Tower No. 01 Near Sangal to Tower No. 69 Near Potha Sharif (23.5 km)

All drawings/data submitted for approval shall conform to ISO paper sizes A0 to A4.

The Contractor shall submit detailed drawings as required herein below:

(i) Plan & profile drawings (only diverted portion) showing spotted towers, construction structure list, soil investigation reports and other data as required by the Engineer.

(ii) Bar bending schedule for various types of foundations/piles.

(iii) Drawings indicating crossings of transmission lines over Railway tracks and Highways.

(iv) Specifications and details of concrete mix ratio and aggregate grading.

(v) Sag templates for tower spotting.

(vi) Any other information and drawing which may be required for construction purposes.

SP-06.3 Distribution of Drawings

The drawings shall be submitted to the Engineer/Employer 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		Employer/ Project Director	Total
	Head Office	Site Office		
Drawings for approval	3	-	1	4
Approved Drawings	2	2	1	5
Schedules, specifications and other documents/data	2	1	1	4
Construction Drawings	2	6	2	10
Soil Investigation Reports	3	-	1	4
Record (As-Built) Drawings	2	-	4	6
Reproducible transparency Record (As-Built) Drawings	1	-	1	2
Record (As-Built) Drawings on computer compact diskette (CD/DVD) using AutoCAD Software	1	-	1	2
Insurance Certificates	1	1	2	4
Receiving reports	1	1	2	4
Damage reports	1	1	2	4
Erection progress Reports	2	1	2	5
List of Construction Stringing and Erection Equipment	1	1	1	3
Correspondence with Employer	1	1	1	3
Correspondence with Head office of Engineer	1	1	1	3
Correspondence with the Site Office of Engineer	1	1	1	3

SP-06.3.1 Record Drawings

In the event of the Works or any part thereof being, with the approval of the Engineer, properly built-in or installed otherwise than in accordance with the Approved Drawings, then the Contractor shall ensure that the Approved Drawings are marked up to show the conditions of the Works as installed and at least two (2) copies of such marked up drawings shall be submitted by the Contractor to the Engineer for approval. One copy of each of marked -up drawings approved by the Engineer shall be returned to the Contractor by the Engineer and these shall be used for the preparation of the Record Drawings within sixty (60) days after the completion of Works of the line. A further copy of each of the marked-up drawings shall be retained by the Engineer for the purpose of checking the Record Drawings.

The Contractor shall furnish to the Engineer two (2) complete sets of all Record Drawings and Data prior to issuance of the Operational Acceptance Certificate. The Contractor shall also furnish to the Engineer one (1) mylar polyester base full-size reproducible and one copy on a computer compact diskette (CD/DVD) using AutoCAD, of all final Records and other drawings which, in the opinion of the Engineer, may be required for the Works operation and maintenance, for identification of parts and for ordering replacement parts and materials. The mylar reproducible shall be 50/70 microns thick, double matte film, washed off the film, and printed on the front.

SP-07 INSURANCE OF MATERIALS FURNISHED BY NGC

The Contractor shall maintain and pay for insurance for Materials furnished by NGC, against loss or damage of the Material caused by, or resulting from but not limited to the following:

(1) Fire, smoke, explosion, falling objects, impacts by aircraft or land vehicles, lightning, riot, the escape of water, flood, Act of God, land sliding, vandalism or malicious mischief, windstorm, rain, or hailstorm, and

(2) Theft or attempted theft:

for the full assessed value of the Materials. The insurance shall commence and shall be in force no later than the time of receipt from NGC's stores where the Contractor is required to obtain the Materials. This insurance must remain in force until the contractor clears and finalizes all accounts of Materials furnished by NGC and the Material is returned to NGC. Certificates of such insurance and all renewals thereof shall be filed with the Engineer. The insurance cover shall be obtained from an insurance company approved by NGC.

The Contractor shall be responsible for the safety and protection of Materials from the point where and at the specified time when he is required to obtain the Materials until the Material is returned to NGC. Should a loss be sustained, the Contractor shall replace or repair any loss or damage and complete the Works in accordance with the Contract on a priority basis after such loss or damage without waiting for the settlement of the insurance claim.

SP-08 HANDLING, LOADING AND UNLOADING OF EQUIPMENT & MATERIAL

SP-8.1 Lifting

The method of lifting, type of equipment and type of slings, used for handling the conductor reels are subject to approval by the Engineer. The wooden reels are so constructed as to be supported either on an axle through the arbor hole or by the reel flange. When the reels are lifted by an axle supported from above, a spreader bar must be employed to prevent reel damage by inward pressure on the reel flange. In no case shall metallic slings or other metallic equipment come in contact with the conductor or ground wire.

SP-8.2 Slings

If the use of slings is necessary, these shall be of a flexible type and preferably manila rope or other non-metallic materials. The use of steel wire, mesh or chain link slings is prohibited unless they are covered with a rubber hose or some similar material.

SP-8.3 Unloading and Storage at the Site

(1) The Contractor shall unload all Plant and other material at the Site. Items for permanent installations shall be properly stored and shall be protected as required to prevent damage or deterioration of any type. Storage/Stacking methods shall be such as to cause minimum inconvenience to others and shall be arranged to facilitate inspection.

(2) All Plant and other material storage shall comply with the requirements of the Specifications or to the approval of the Engineer.

SP-8.4 Ownership of Packing Materials

All packing boxes, reels, and shipping containers except those containers which are not the property of the Contractor, planking covers, etc. shall become the property of the Employer. All the packing materials shall be handed over to the Employer immediately after storage requirements of the Plant or parts including spares thereof and other materials are over.

SP-9 SCHEDULE, PROGRESS REPORTS AND MEETINGS

SP-9.1 Schedule

The Contractor shall carry out the Works in accordance with the dates/periods specified in Appendix-A to Bid. The Contractor shall regularly review the Schedule and notify the Engineer promptly of any revisions which in his view may be required from time to time.

SP-9.1.1 Form of Construction Schedule

The Schedule shall be a detailed CPM (critical path method) type, time scaled according to calendar dates and Project month numbers. The CPM for planning, scheduling, and controlling will be used for the Contract. The Contractor shall submit a schedule showing the logical sequence in which the Plant will be carried out in sufficient detail to satisfy the Engineer that the Plant is thoroughly planned and meets all the requirements of the Contract Documents.

SP-9.2 Progress Meetings

(1) Soon after the date of signing of the Contract, the Engineer will, with the approval of the Employer require a conference with the Employer and the Contractor at a place mutually agreed upon, to discuss progress monitoring and proper execution of the Contract.

(2) At monthly intervals or from time to time during the execution of the Contract, the Engineer may call meetings, either in his offices or at the Contractor's offices or Employer's office as is deemed necessary for progress monitoring and proper execution of the Contract.

(3) As required by the Engineer, responsible representatives of the Contractor shall attend such meetings.

(4) All expenses incurred by the Contractor for attending such meetings shall be borne by the Contractor and shall not be reimbursable.

SP-10 SITE WORKS

Attention is drawn to the obligations of the Contractor to make his arrangements at his own expense for Works provided to his employees. Any cost incurred by the Contractor in respect of any of such Site Works under the Contract shall be deemed to be included in the rates and prices in the Price Schedules and no separate payment, therefore, will be made to the Contractor.

SP-10.1 Accommodation

(1) The Contractor shall provide and maintain at his cost residential accommodation and transportation Works for his use.

(2) 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 this Contract including all fencing, electricity supply, sanitation, cook, houses, fire prevention, water supply and other requirements in connection with such housing accommodation or amenities.

SP-10.2 Offices

The Contractor shall arrange and maintain his offices at his own cost.

SP-10.3 Work-yards and Storage Areas

(1) No storage site shall be provided by the Employer to store the Plant and other materials. The Contractor shall, furnish all the necessary services and be responsible for the construction and maintenance of the necessary construction camps, offices, and stores; and perform all other work necessary for completion of the Works described herein in strict conformance with these Specifications.

(2) The Contractor shall provide his security guard service to ensure the security and safety of the Plant and other materials prior to Employer takes over the Works.

SP-10.4 Temporary Buildings

(1) The Contractor shall provide and maintain all temporary structures required including warehouses, change houses for workers, sheds, etc. He shall also provide his own field office complete with a telephone so that he or his official representative can be contacted by Employer and/or Engineer at all times.

(2) Such temporary buildings and/or utilities shall remain the property of the Contractor and shall be removed by him at his expense upon the completion of the Works and the Site reinstated to its original condition, all to the approval of the Engineer.

SP-11 QUALITY CONTROL

The Contractor's Quality Control Department shall review all contract and specification requirements and ensure that they are understood.

Upon the award of the Contract, the Contractor, NGC and the Engineer shall establish mutually acceptable quality control and inspection procedures between the Contractor and the Engineer and indications are to be given at that time by the Contractor as to how the agreed procedures will be implemented.

All Works covered by the Contract and the inspection thereof by the Contractor shall be subject to surveillance and/or further inspection by NGC and/or the Engineer or by their authorized representative for which purpose the Contractor (or Sub-Contractor) shall:

(1) Demonstrate to the satisfaction of the Engineer or his authorized Representative that the Works meet the requirements of the Contract.

(2) Not cover up or put out of view Works until the Engineer or his authorized representative has been notified and release of Works has been obtained.

(3) Afford full opportunity for the Engineer or the Engineer's Representative to examine and measure any work which is about to be covered up or put out of view and to examine foundations before permanent work is placed thereon.

(4) Give due notice to the Engineer's Representative whenever any Work or foundations is/are ready or about to be ready for Examination.

SP-12 URGENT REPAIRS

If because of any accident or failure or other event occurring in or in connection with the Work or any part thereof either during the execution of the Work or the Period of Guarantee any remedial of other Work or repair shall in the opinion of the Engineer or the Engineer' Representative be urgently necessary for security and the Contractor is unable or unwilling at once to do such Work or repair, NGC may employ its own or other workmen do such work or repair as the Engineer or the Engineer's representative may consider necessary. If the Work or repair so done by NGC is Work which in the opinion of the Engineer the Contractor was liable to do at his own expense under the Contract all costs and charges properly incurred by NGC in so doing shall on demand be paid by the Contractor to NGC or may be deducted by NGC from any money due or which may become due to the Contractor.

SP-13 MEASUREMENT FOR PAYMENT

The measurement for payment and payment for the various items of Price Schedules shall be as follows:

(a) **Construction of Unpaved Access Road**

Payment will be made for the construction of unpaved access roads as per actual installed/constructed measurements in aggregate proportion to the respective specifications.

Measurement of the Access Road will be calculated in the following manner:

W_o: Width Specified in the Specification Drawings
W_1: Width of Newly Constructed / Extension of Existing Access Road
Adjusted Rate Per Unit Length = $(\frac{W1}{Wo})$ x Quoted Unit Rate Unit Length

The payment will be made as per the following percentage:

60% upon completion of the access road,
15% upon the erection of the respective tower,
15% upon stringing of respective stretch &
10% upon completion of the Project.

Employer will assess the compensation for unavoidable crop damage that occurs on the right of way of access roads in cultivated areas. The Contractor will pay the compensation amount and will get it reimbursed as per actuals without any overhead interest or profit etc.

(b) **Clearing Right-of-Way**

Measurement for payment will be made horizontally along the centre line of right-of-way cleared and disposal completed.

Payment will be made based on the unit price quoted in Price Schedules. The payment shall include, but not be limited to the brushing out the centerline, tower locations and conductor pulling sites within 25 meters on each side of the centerline. Trees over 2.5 meters in height which constitute a hazard or danger to the transmission line, or whose tops are within 6 meters of the 90°C final conductor position shall be removed.

(c) **Check Survey**

Measurement for payment will be made on the check survey carried out as given Technical Provisions.
Payment will be made on a lump sum basis after fulfilling all requirements given in Technical Provisions.

(d) **Survey (Only for diverted portion)**

Measurement for payment will be made horizontally along the center line of the line route.

Payment will be made based on the unit price quoted in the Price Schedules after the approval by the Engineer of the detailed survey, plan, and profile drawings, and construction structure list. The unit price shall include but not be limited to the route

establishing, detailed survey, route maps, plan tabling, profile preparation, tower spotting, construction structure list, and all other work necessary for the completion of this phase of work.

(e) **Sub Soil Investigation (Drilling Boreholes, SPT and undisturbed sampling) (Only for diverted portion)**

Measurement for drilling and testing shall be made for the actual length of boreholes drilled including SPT tests performed of a diverted portion only with the approval of the Engineer and actual excavated depth for test pits.

Payment shall be based on the unit price quoted in the Price Schedules. All the necessary operations done to accomplish drilling and testing as specified shall be deemed to be part of this item and no extra payment for such operation shall be made. The cost of standard penetration tests, rock coring, undisturbed sampling, and block sampling (in the case of test pits) is included in the cost of Sub Soil Investigations and includes but is not limited to all costs and expenses for records, operations, samples, preservation, and transportation to the laboratory of the selected disturbed/ undisturbed samples taken from the SPT Spoon.

(f) **Laboratory Tests**

No Payment shall be made for any laboratory test performed. The unit price given for sub-soil investigations shall be deemed to include complete laboratory testing for the specified tests according to the ASTM Standards and compilation and presentation of reports including foundation design/designation in standard form as approved by the Engineer.

(g) **Reinforced Concrete Foundations**

Measurement for payment will be made for each type of foundation installed as shown on the approved relevant construction drawings for the various foundations.

Payment: Drawings for concrete foundations provided in the Specification Drawings are firm and final and no change is acceptable except from the Engineer.

In case of any change in foundation type, the unit cost of foundations will be adjusted (increase/decrease) as under:

Unit rate (PKR/cu.m) (X) = Bidder quoted price for the particular
foundation type [Volume of foundation (4-legs) as per bid drawings].

Derived/adjusted unit foundation price
Unit Price (PKR/cu.m) (X)* Volume of foundation (4-legs) worked out
from approved foundation construction drawings.

The quoted unit price shall include, but not be limited to tower staking, site contouring, the cost of furnishing all labour, equipment, materials (including concrete and reinforcement, etc.) site levelling, blasting/cutting/grading of the tower site either for (equal or unequal leg extensions), excavation, shuttering, dewatering, shorting, forming, reinforcing, concreting, curing, backfilling, installing stub angles, tower grounding, setting, and all other associated Works to produce finished foundations.

Due to uneven contours of the area, cutting beyond 10.5 meter [6 meter (tower leg difference) + 4.5 meter (chimney extension)] will be paid as per unit rate specified in item (i) & (iv) of "Installation Services for Additional Works" of the Price Schedule, in accordance with actual measurement.

(h) **Installing Piles/Pile Cap/Tie Beam**

The measurement under this item shall be made at the actual number of the foundations constructed and the actual length of each pile, and pile cap installed as shown on the Bid Drawings and according to the Specifications. Bid drawings are firm & final and no change is acceptable except from the Engineer. In such cases, rates will be derived from similar works.

Payment shall be made following the unit price quoted in the Price Schedules. Such unit price shall constitute full compensation for pile foundation construction based on the measurement described above. Such payment shall be deemed to include the cost of tower staking, making boreholes, cost of materials (including concrete and reinforcement, etc.), ramp, placement, and curing of concrete, backfilling, installing stub angles, tower grounding and all other arrangements required to complete the pile foundation to the satisfaction of the Engineer.

(h) **Retaining wall/Gravel Blanket/Gabion**

Measurement for payment will be made for retaining wall/Gravel Blanket/Gabion installed/carried out as per approved relevant construction drawings prepared by the Contractor and subsequently approved by the Engineer for a particular tower location.

Payment shall be made following the unit price quoted in the Price Schedules. Such unit price shall constitute full compensation for Retaining wall/Gravel Blanket/Gabion construction based on the measurement described above. Such payment shall be deemed to include the cost of site contouring, the cost of furnishing all labour, equipment, and material (including PCC concrete, lean, gravel, cement, sand, mesh of steel wire, weep hole, grouting, etc.), site levelling, blasting/cutting/grading in the vicinity of tower site, excavation, shuttering, shorting, forming, concreting, curing, backfilling, and all other associated Works to produce finished the works.

(i) **Steel Tower Erection**

Measurement for payment will be made for each type of component installed as shown on the relevant drawings for the various towers.

Payment will be made based on the unit prices quoted in the bid for each type of component installed of all tower types:

85% upon completion of the tower erection;
15% upon the tightening of the respective tower;

The unit price shall include, but not be limited to, detailing of tower fabrication drawings supplied by the Employer, the cost of all labour, equipment, requisitioning, loading, transporting, from site storage areas to the sites, erecting together with bolts, nuts, washers, step bolts, anti-theft nuts including back bolting and punching of nuts and

bolts and all other associated work necessary for the completion of the towers ready for installation of overhead alumoweld shield wire, OPGW, and conductors thereon.

(j) **Welding of Nuts & Bolts**

Measurement for measurement will be made for each tower.

Payment will be made on the unit price quoted for each tower. The unit prices shall include, but not be limited to welding of nuts & bolts up to 8.0 m height and application of galvanox as specified in technical provisions and price schedule.

(k) **Stringing OPGW and Conductor**

Measurement for payment will be made horizontally along the centre line of the line route.

Payment will be made based on the unit price quoted in the Price Schedules as per the following percentage for:

Conductor

60% upon completion of stringing & sagging,
25% upon completion of dead-ending & Clipping,
07% upon installation of jumpers and
08% upon installation of dampers.

OPGW

70% upon completion of stringing & sagging,
15% upon completion of dead-ending & Clipping and Installation of Dampers, and
15% upon installation of Splicing & Joint Boxes.

The unit prices shall include, but not be limited to, the cost of all labour, equipment, requisitioning, loading, transporting, distributing, stringing including but limited up to the installation of insulator, OPGW hardware assemblies; accessories for conductor and OPGW along with associated equipment; spacer dampers for conductor and stock bridge type vibration dampers for OPGW, sagging, clipping-in, dead-ends, jumpers including installation of spacer, together with all hardware as shown on the relevant drawings, and all other associated work necessary for the completion of this phase of the work.

(l) **Erosion and Slope Protection**

Payment will be made for the erosion and slope protection of the respective tower leg as per the approved drawing on the instruction of the Engineer.

Measurement of the work done will be calculated as per actual construction and payment will be made from the Additional Works.

SP-14 PAYMENT FOR WORKS REQUIRED BY SPECIAL PROVISIONS

Unless expressly excluded, the cost of all Works required by the "Special Provisions" shall be included in the price and amounts quoted in the Price Schedules.

SP-15 SOCIAL SAFEGUARD, EIA AND BIODIVERSITY ACTION PLAN (BAP) IMPLEMENTATION

Social Safeguard, EIA and Biodiversity Action Plan (BAP), attached as Annexure hereto, shall be implemented and the implementation progress, encountered problems and proposal of respective mitigation measures shall be reported in periodic progress reports. The Contractor shall ensure implementation of Social Safeguard, EIA and BAP during the commencement of works, in accordance with three-tiered approach specified in Sub-Clause PCC 41.1 of Particular Conditions of the Contract.

Civil Works, Erection, Stringing, Testing & Commissioning of 500kV D/C Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station (approx. 83.5km), using ACSR "Bunting" Conductor

Bill of Quantities
for
Lot-I: 500kV Double Circuit Quad Bundle Transmission Line from Tower No. 01 Near Sangal to Tower No. 69 Near Potha Sharif (Approx. 23.5km)

Item No.	Description	Unit	Qty	Unit Price (PKR) without PST	Total Price (PKR)	Provincial Sales tax (PST) in PKR	Total Price including PST in PKR
1	2	3	4	5	6=4*5	7	8= 6+7
A	**Survey**						
1	Clearing Right of Way (ROW)	Lump Sum	1				
2	Validation of already established center line of route prior to foundation construction and preparation of as-built plan & profile drawings of the already prepared plan & profile drawings using PLS-CADD (Version 16.20) after incorporating all the changes, contouring and construction structure lists of the constructed transmission line and submitted to the Engineer using RTK/UAV. In case of route diversion, payment of the diverted portion will be made as per item A.3	km	23.5				
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	10				
	Sub-Total A:						
B	**Sub-soil Investigations:** Confirmatory sub-soil Investigation (if required) in varied soil/boulder/rock (including laboratory tests) as per Specifications and submission of Sub-Soil Investigation Report.						
(a)	From NSL to depth of 15 m	Lin. Mtr.	100				
(b)	From 15 m to depth of 25 m	Lin. Mtr.	25				
(c)	Test pit upto depth of 3m	Lin. Mtr.	25				
	Sub-Total B:						
C	**Foundations**						

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1	2	3	4	5	6=4*5	7	8= 6+7
	Reinforced Concrete Spread Foundations in varied soil as well as boulders/rock complete with supply of materials including excavation, blasting, leveling, grading of tower site, cutting, shuttering, reinforcement, concreting, curing/bitumen coating, dewatering, preparation of multi-step platforms for overall stability, well-compacted backfilling of foundations after concreting with excavated/borrowed earth (irrespective of lead) 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:						
	(a) Suspension Tower Type 'SDS'						
	(i) Foundation Type D1 (Dry)	Foundation	2				

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1	2	3	4	5	6=4*5	7	8= 6+7
	(ii) Foundation Type D2 (Dry)	Foundation	2				
	(iii) Foundation Type D3 (Dry)	Foundation	3				
	(iv) Foundation Type D4 (Dry)	Foundation	1				
	(v) Special Foundation	Foundation	4				
	(vi) Chimney Extension for Special Foundation (beyond 1.0m above NSL)	Lin.mtr	48				
	(b) Suspension Tower Type 'SDL-S'						
	(i) Foundation Type D1 (Dry)	Foundation	0				
	(ii) Foundation Type D2 (Dry)	Foundation	1				
	(iii) Foundation Type D3 (Dry)	Foundation	1				
	(iv) Foundation Type D4 (Dry)	Foundation	0				
	(v) Special Foundation	Foundation	2				
	(vi) Chimney Extension for Special Foundation (beyond 1.0m above NSL)	Lin.mtr	24				
	(c) Light Angle Tower Type 'SDL-A'						
	(i) Foundation Type D1 (Dry)	Foundation	2				
	(ii) Foundation Type D2 (Dry)	Foundation	3				
	(iii) Foundation Type D3 (Dry)	Foundation	5				
	(iv) Foundation Type D4 (Dry)	Foundation	1				
	(v) Special Foundation	Foundation	4				
	(vi) Chimney Extension for Special Foundation (beyond 1.0m above NSL)	Lin.mtr	60				
	(d) Medium Angle Tower Type 'SDM'						
	(i) Foundation Type D1 (Dry)	Foundation	2				
	(ii) Foundation Type D2 (Dry)	Foundation	4				
	(iii) Foundation Type D3 (Dry)	Foundation	5				
	(iv) Foundation Type D4 (Dry)	Foundation	1				
	(v) Special Foundation	Foundation	2				
	(vi) Chimney Extension for Special Foundation (beyond 1.0m above NSL)	Lin.mtr	60				

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Item No.	Description	Unit	Qty	Unit Price (PKR) without PST	Total Price (PKR)	Provincial Sales tax (PST) in PKR	Total Price including PST in PKR
1	2	3	4	5	6=4*5	7	8= 6+7
	(e) Heavy Angle/Transposition Tower Type 'SDD' & 'SDT'						
	(i) Foundation Type D1 (Dry)	Foundation	4				
	(ii) Foundation Type D2 (Dry)	Foundation	9				
	(iii) Foundation Type D3 (Dry)	Foundation	4				
	(iv) Foundation Type D4 (Dry)	Foundation	1				
	(v) Special Foundation	Foundation	4				
	(vi) Chimney Extension for Special Foundation (beyond 1.0m above NSL)	Lin.mtr	60				
	Sub-Total C:						

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Item No.	Description	Unit	Qty	Unit Price (PKR) without PST	Total Price (PKR)	Provincial Sales tax (PST) in PKR	Total Price including PST in PKR
1	2	3	4	5	6=4*5	7	8= 6+7
D	Reinforced concrete Single pile per footing (cast in situ installation) complete for all types of soil/rock/boulder with supply of materials as per specification drawing no. 4029/169/TD/G015 and drawing no. 4029/169/TD/G016 tower staking, stub setting including installation of tower stubs and tower grounding etc. complete.						
	(a) Reinforced concrete pile caps for tower types:						
	(i) SDS & SDL-S/SDL-A	Foundation	1				
	(ii) SDM & SDD	Foundation	1				
	(b) Reinforced concrete piles (cast in situ installation) for tower types:						
	(i) SDS and SDL-S/SDL-A upto depth of 25 m	Lin.mtr	80				
	(ii) SDM & SDD upto depth of 30 m	Lin.mtr	100				
	Sub-Total D:						
E	Design, supply and construction of cable car/sky rope with 2.0 to 4.75 ton capacity. The cable car/sky rope will be electric driven or by petrol/diesel engine with brakes. The safety of persons and T&P will have to be main objective while designing/installation. All material/mechanical components and construction (blasting, cutting, excavation, filling, shoring, dewatering, concrete, rebar steel, placing etc.) complete in all respects are included in the scope and unit quoted price. The design has to be got vetted by the Engineer before execution. All running and maintenance cost are also included in the unit price. Periodic validation of installation is included in the Contactor scope of works. After commissioning of transmission line all installation should be handed over to NTDC in complete healthy operational condition.						
E-1	Upto 2.0 Ton Capacity						
	(i) for span length upto 80m	No.	1				
	(ii) for span length upto 100m	No.	1				
	(iii) for span length upto 135m & beyond	No.	1				
E-2	Upto 2.0 - 3.25 Ton Capacity						
	(i) for span length upto 80m	No.	1				
	(ii) for span length upto 100m	No.	1				

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for
Lot-I: 500kV Double Circuit Quad Bundle Transmission Line from Tower No. 01 Near Sangal to Tower No. 69 Near Potha Sharif (Approx. 23.5km)

Item No.	Description	Unit	Qty	Unit Price (PKR) without PST	Total Price (PKR)	Provincial Sales tax (PST) in PKR	Total Price including PST in PKR
1	2	3	4	5	6=4*5	7	8= 6+7
	(iii) for span length upto 135m & beyond	No.	1				
E-3	Upto 3.25 - 4.75 Ton Capacity						
	(i) for span length upto 80m	No.	1				

Civil Works, Erection, Stringing, Testing & Commissioning of 500kV D/C Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station (approx. 83.5km), using ACSR "Bunting" Conductor

Bill of Quantities
for
Lot-I: 500kV Double Circuit Quad Bundle Transmission Line from Tower No. 01 Near Sangal to Tower No. 69 Near Potha Sharif (Approx. 23.5km)

Item No.	Description	Unit	Qty	Unit Price (PKR) without PST	Total Price (PKR)	Provincial Sales tax (PST) in PKR	Total Price including PST in PKR
1	2	3	4	5	6=4*5	7	8= 6+7
	(ii) for span length upto 100m	No.	1				
	(iii) for span length upto 135m & beyond	No.	1				
	Sub-Total E:						
F	Unpaved access roads 4.5m wide to tower site (as per Technical Provisions and Specification Drawings) construction/widening including construction of approaches, culverts, drainage structures, retaining walls, filling of ditches, blasting, dozing trails, and other works depending on the type of terrain. Unpaved access roads suitable road approaches for safe access of equipment and vehicles. Proper surface drainage shall be provided. For easier accessibility during construction and later for inspection, operation and maintenance of the transmission lines, unpaved access road shall be located as near as possible to transmission lines in accordance with requirements of Bidding Documents.	km	40				
	Sub-Total F:						
G	**Erection of Steel Towers**						
1	Transport and Install 500kV double circuit tower types 'SDS', 'SDL-S', 'SDL-A', 'SDM' & 'SDD' with all accessories in accordance with requirements of Bidding Documents using Gin Pole/Piece by piece/Crane.						
	(a) Tower Type "SDS"						
	(i) Basic Tower Body	No.	12				
	(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.	12				
	(v) 8.0 m Single Leg Extension	No.	28				
	(vi) 6.0 m Body Extension	No.	11				
	(b) Tower Type "SDL-S"						
	(i) Basic Tower Body	No.	4				
	(ii) 2.0 m Single Leg Extension	No.	4				
	(iii) 4.0 m Single Leg Extension	No.	4				

Civil Works, Erection, Stringing, Testing & Commissioning of 500kV D/C Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station (approx. 83.5km), using ACSR "Bunting" Conductor

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for
Lot-I: 500kV Double Circuit Quad Bundle Transmission Line from Tower No. 01 Near Sangal to Tower No. 69 Near Potha Sharif (Approx. 23.5km)

Item No.	Description	Unit	Qty	Unit Price (PKR) without PST	Total Price (PKR)	Provincial Sales tax (PST) in PKR	Total Price including PST in PKR
1	2	3	4	5	6=4*5	7	8= 6+7
	(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.	4				
	(c) Tower Type "SDL-A"						
	(i) Basic Tower Body	No.	16				
	(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.	16				
	(v) 8.0 m Single Leg Extension	No.	36				
	(vi) 6.0 m Body Extension	No.	15				
	(d) Tower Type "SDM"						
	(i) Basic Tower Body	No.	14				
	(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.	8				
	(v) 8.0 m Single Leg Extension	No.	32				
	(vi) 6.0 m Body Extension	No.	15				
	(e) Tower Type "SDD"						
	(i) Basic Tower Body	No.	23				
	(ii) 2.0 m Single Leg Extension	No.	12				
	(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.	56				
	(vi) 6.0 m Body Extension	No.	7				

Civil Works, Erection, Stringing, Testing & Commissioning of 500kV D/C Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station (approx. 83.5km), using ACSR "Bunting" Conductor

Bill of Quantities
for
Lot-I: 500kV Double Circuit Quad Bundle Transmission Line from Tower No. 01 Near Sangal to Tower No. 69 Near Potha Sharif (Approx. 23.5km)

Item No.	Description	Unit	Qty	Unit Price (PKR) without PST	Total Price (PKR)	Provincial Sales tax (PST) in PKR	Total Price including PST in PKR
1	2	3	4	5	6=4*5	7	8= 6+7
	(vii) 10.0 m Body Extension	No.	8				
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	69				
3	Furnish and install anti-climbing devices, number plates, danger signs, phase plates and aerial marker plates (on every tenth tower).	Each tower	69				
	Sub-Total G:						
H	**Stringing of Conductor, Aluminum Clad Steel Shield Wire & OPGW**						
1	Transport & Install 1192.5KCM ACSR Bunting 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	23.5				
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	23.5				
3	Transport and install Aluminum Clad Shield wire, hardware assemblies, accessories & dampers etc. complete in all respects as per specifications & approved drawings.	km	23.5				
	Sub-Total H:						
I	**Mitigation Measures for Environmental Management and Monitoring Plan (EMMP)**						
1	One Environmental Officer/HSE Officer, should have bachelors/ masters in Environmental Engineering/ Sciences. He will be responsible for implementing and monitoring of EMP/HSE Measures and quarterly report preparation and submission to ESIC, NTDC. He will also submit SSEMP (Site Specific Environmental Management Plan), waste management plan, HSE plan and emergency response plan before mobilization of the contractor.	Lot	1				

Civil Works, Erection, Stringing, Testing & Commissioning of 500kV D/C Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station (approx. 83.5km), using ACSR "Bunting" Conductor

Bill of Quantities
for
Lot-I: 500kV Double Circuit Quad Bundle Transmission Line from Tower No. 01 Near Sangal to Tower No. 69 Near Potha Sharif (Approx. 23.5km)

Item No.	Description	Unit	Qty	Unit Price (PKR) without PST	Total Price (PKR)	Provincial Sales tax (PST) in PKR	Total Price including PST in PKR
1	2	3	4	5	6=4*5	7	8= 6+7
2	One Social/ Revenue Officer, should have Masters of Sociology. He will review and validate the monitoring reports ; responsible for RP implementation including payment of compensation to the DPs; report status of redressal of community complaints and time spent to resolve the community grievances, carry out the consultations with DPs, officials of project management and other concerned departments to share the feedback/ lessons learnt; Identify gaps regarding RP implementation and suggest remedial measures; and also develop a corrective action plan; and assess the resettlement implementation efficiency, effectiveness, impact and its sustainability.	Lot	1				
3	Water quality monitoring / testing / analysis for Surface & Drinking Water (if water is present within 100m) [All relevant tests]	TEST / Quarter	2				
4	Air quality monitoring / testing [All relevant tests]	TEST / Quarter	2				
5	Noise monitoring / analysis / measurement [All relevant tests]	TEST / Quarter	2				
6	Tree Plantation (pine, chir, kikar, poplar, fig, apple etc.)	Unit	30,000				

Civil Works, Erection, Stringing, Testing & Commissioning of 500kV D/C Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station (approx. 83.5km), using ACSR "Bunting" Conductor

Bill of Quantities
for
Lot-I: 500kV Double Circuit Quad Bundle Transmission Line from Tower No. 01 Near Sangal to Tower No. 69 Near Potha Sharif (Approx. 23.5km)

Item No.	Description	Unit	Qty	Unit Price (PKR) without PST	Total Price (PKR)	Provincial Sales tax (PST) in PKR	Total Price including PST in PKR
1	2	3	4	5	6=4*5	7	8= 6+7
7	EMP Implementation Cost which includes environmental & Social mitigation measures, monitoring and evaluation, HSE trainings, management along with contingencies.	Lot	1				
	Sub-Total I:						
J	**Health and Safety**						
	(a) **Consumable**						
	(i) First Aid Kits	No.	3				
	(ii) Personal Protective Equipment	No.	150				
	(iii) Fire Extinguishing Agents	No.	30				
	(iv) Safety Lights	No.	30				
	(v) Emergency Lights	No.	30				
	(vi) Torch	No.	30				
	(vii) Safety Tape	No.	45				
	(viii) Breathing Appliances	No.	15				
	(b) **Non-Consumable**						
	(i) Ladders	No.	3				
	(ii) Fire extinguishers	No.	30				
	(iii) Fire Alarm system	No.	3				
	(iv) Safety Signs	No.	60				
	(v) Fall Protection	No.	15				
	(vi) Traffic Control Signs	No.	30				
	(vii) Protective Barriers	No.	30				
	(viii) Spill Response	No.	3				
	(c) **Solid Waste Handling**						
	(i) Solid waste handlers (waste disposal services)	No.	3				
	(ii) Garbage cans (1 for each type of waste x 3)	No.	15				
	(iii) Wheel barrows	No.	3				

Civil Works, Erection, Stringing, Testing & Commissioning of 500kV D/C Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station (approx. 83.5km), using ACSR "Bunting" Conductor

Bill of Quantities
for
Lot-I: 500kV Double Circuit Quad Bundle Transmission Line from Tower No. 01 Near Sangal to Tower No. 69 Near Potha Sharif (Approx. 23.5km)

Item No.	Description	Unit	Qty	Unit Price (PKR) without PST	Total Price (PKR)	Provincial Sales tax (PST) in PKR	Total Price including PST in PKR
1	2	3	4	5	6=4*5	7	8= 6+7
	(iv) Skips for wood and timbers	No.	3				
	(v) Waste segregation bins with color coding at construction sites	No.	15				
	(vi) Drums for hazardous waste	No.	3				

Civil Works, Erection, Stringing, Testing & Commissioning of 500kV D/C Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station (approx. 83.5km), using ACSR "Bunting" Conductor

Bill of Quantities
for
Lot-I: 500kV Double Circuit Quad Bundle Transmission Line from Tower No. 01 Near Sangal to Tower No. 69 Near Potha Sharif (Approx. 23.5km)

Item No.	Description	Unit	Qty	Unit Price (PKR) without PST	Total Price (PKR)	Provincial Sales tax (PST) in PKR	Total Price including PST in PKR
1	2	3	4	5	6=4*5	7	8= 6+7
	(vii) Waste bins for medical waste	No.	3				
	(viii) Sharp containers	No.	3				
	(d) **HSE Staff**						
	(i) Sanitary Workers	No.	9				
	(ii) Medical Staff/ Dispenser	No.	1				
	Sub-Total J:						
K	Dismantling of Conductor Jumpers from the interim energization/connection arrangement of Suki Kinari T/Line at Sangal point and to Install conductors & Jumpers from the Last Tower of the interim arrangement to the first tower of this Lot, as advised by the Engineer to its satisfaction.	Lump Sum	1				
	Sub-Total K:						
L	**Testing & Commissioning of Transmission Line**	Lump Sum	1				
	Sub-Total L:						
M	**Installation Services for Additional Work (furnish and install)**						
	(i) Grading/Cutting/Excavation (Dry Soil)	Cu. m.	3000				
	(ii) Excavation (semi-submerged soil)	Cu. m.	5				
	(iii) Excavation (submerged soil)	Cu. m.	5				
	(iv) Blasting/Cutting/Excavation/Grading (boulder/Rock)	Cu. m.	6000				
	(v) Concrete (3000 psi at 28 days) furnished and installed	Cu. m.	500				
	(vi) Reinforcing Bars furnished and installed (Grade-60)	kg	4000				
	(vii) Overhaul from Borrow and Compaction (regardless of the distance for borrow)	Cu. m.	1000				
	(viii) Lean concrete furnished and installed (2000 psi strength at 28 days)	Cu. m.	50				
	(ix) Compacted crush sand (50:50 ratio) installed under footings	Cu. m.	50				
	(x) Bitumen coating for footing	Sq. m	100				
	(xi) Permanent mild steel casing having inner dia 1550mm with 10mm thickness	Lin.m	25				
	(xii) Permanent mild steel casing having inner dia 1225mm with 10mm thickness	Lin.m	25				

Civil Works, Erection, Stringing, Testing & Commissioning of 500kV D/C Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station (approx. 83.5km), using ACSR "Bunting" Conductor

Bill of Quantities
for
Lot-I: 500kV Double Circuit Quad Bundle Transmission Line from Tower No. 01 Near Sangal to Tower No. 69 Near Potha Sharif (Approx. 23.5km)

Item No.	Description		Unit	Qty	Unit Price (PKR) without PST	Total Price (PKR)	Provincial Sales tax (PST) in PKR	Total Price including PST in PKR
1	2		3	4	5	6=4*5	7	8= 6+7
	(xiii)	Plain Cement Concrete (PCC) retaining wall /protection wall including excavation/blasting, concrete regardless of lead, shuttering, reinforcing rebars, compacted backfill, with proper slope for surface drainage, application of bitumen coating on both sides of wall as per specification and drawing for PCC retaining/protection walls complete in all respect as per drawing no. 4029/169/TD/01G018.	Cu. m.	1000				
	(xiv)	Stone pitching with PCC mortar furnished and installed as per specifications & drawings.	Cu. m.	1000				

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1	2		3	4	5	6=4*5	7	8= 6+7
	(xv)	Blasting/excavation and fixing/placement Stone box gabion (material+installation) complete in all respect as per Bidding Documents.	Cu. m.	1200				
	(xvi)	Blasting/excavation, lean concrete, Stone masonry with PCC mortar, weep holes, PCC at top, backfill etc. furnished and installed as per specifications & drawing for retaining walls complete in all respect as per drawing no. 4029/169/TD/01G017.	Cu. m.	4000				
	(xvii)	Mortar (1:4) furnished and installed	Cu. m.	2000				
	(xviii)	Supply of Chequered Plates with its minimum thickness of 6mm and it shall conform to all the requirements of ASTM A786 or ASTM A240 or ASTM A36 as approved by the Engineer.	Sq. m.	1500				
	(xix)	Supply of timber batterns or beams. The timber battens or beams brand/type shall be of "Deodar" or any other brand approved by the Engineer. The dimension of battens shall be as per design requirements and as approved by the Engineer.	Cu. Ft.	12000				
	(xx)	Supply of MS Flat Bars/Strips. The minimum size of MS Flat bar/strip shall be of 50x6mm (width x thickness) and shall conform to all the requirements of ASTM A36 as approved by the Engineer	Lin. Mtr.	4000				
	(xxi)	Supply of Steel Beam Section (Grade-36) as approved by the Engineer	kg	1500				
	(xxii)	Inland Transportation of Material from any NGC designated Store to Project Site [for Stubs / Steel Towers]	Metric Tons / km	50				
	(xxiii)	Inland Transportation of Material from any NGC designated Store to Project Site [for Conductor / Shield Wire / OPGW]	Metric Tons / km	50				
	(xxiv)	Inland Transportation of Material from any NGC designated Store to Project Site [Insulator / Hardware / Dampers / Grounding Material]	Metric Tons / km	50				
	Sub-Total M:							

Civil Works, Erection, Stringing, Testing & Commissioning of 500kV D/C Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station (approx. 83.5km), using ACSR "Bunting" Conductor

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N	**Implementation of EIA, BAP and Social Safeguard requirements stipulated in the Bidding Documents**	Lumpsum	1				
	Sub-Total N:						
O	**Arrangement of Rental Vehicles Including Operation & Maintenance (O&M) (Exclusively for the Engineer)**						
O-1	Monthly Rent and Driver's Pay for the following Vehicles						
	(i) for Double Cabin Pick-up 2800cc Turbo 4x4 (Latest Available Model)	Vehicle-Month	20				
	(ii) for 1500cc Jeep 4x4 (Latest Available Model)	Vehicle-Month	40				
	(iii) for Sedan Car 1600cc (Latest Available Model)	Vehicle-Month	30				
O-2	POL and O&M for the following Vehicles with respect to mileage (please refer to Note # 12)						
	(i) for Double Cabin Pick-up 2800cc Turbo 4x4	km	60,000				
	(ii) for 1500cc Jeep 4x4	km	#######				
	(ii) for Sedan Car 1600cc	km	90,000				
	Sub-Total O:						
P	**Provisional Sums**						
	(i) Compensation for unavoidable Crop damage, tree cutting, relocation/damage to houses etc.	Lumpsum	1	120,000,000			
	(ii) Expenses on Account of Payment to Forest Department to get NoC	Lumpsum	1	75,000,000			
	(iii) Hiring of Revenue Staff to work with the Employer for Resolution of Matters pertaining to RoW and Land/Crop Compensation etc. (a) 02 x Patwaari (b) 02 x Kanoongo	Lumpsum	1	13,000,000			
	Sub-Total P:						
	Total of Item A						
	Total of Item B						
	Total of Item C						
	Total of Item D						
	Total of Item E						

Civil Works, Erection, Stringing, Testing & Commissioning of 500kV D/C Quad Bundle Transmission Line from Sangal to 500kV Maira Switching Station (approx. 83.5km), using ACSR "Bunting" Conductor

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1	2	3	4	5	6=4*5	7	8= 6+7
	Total of Item F						
	Total of Item G						
	Total of Item H						
	Total of Item I						
	Total of Item J						
	Total of Item K						
	Total of Item L						
	Total of Item M						
	Total of Item N						
	Total of Item O						
	Total of Item P						
Total of column 6 to be carried to Letter of Price Bid							

Notes:

1 The quantities given in Bill of Quantities are tentative/estimated.
2 The Contractor shall be paid for the actual quantities installed in accordance with the unit rates given in the Bill of Quantities.
3 Price of any other item specifically not covered in the Bill of Quantities but is required for the completion, testing & commissioning and operation of the overhead line shall be deemed to be included in the Bill of Quantities.
4 Contractor has to shift the installation material from the NTDC Warehouse Moro Switching Station to construction sites.
5 The quoted unit rate should include charges for insurance and transportation (including loading, unloading and stacking etc.) of all the above Goods/materials from NTDC designated Warehouse Moro Switching Station to construction sites.
6 Unit "Foundation" means foundations of four (04) legs of the Tower.
7 Foundation drawings of the Bidding Documents are firm & final and no change is acceptable except from the Engineer's office.

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Item No.	Description	Unit	Qty	Unit Price (PKR) without PST	Total Price (PKR)	Provincial Sales tax (PST) in PKR	Total Price including PST in PKR
1	2	3	4	5	6=4*5	7	8= 6+7

8 **An allowance of two percent (2%) for the Conductor of the total linear length will be permitted for sag of spans, Jumpers including sag, elevation difference and wastage for the Conductor during stringing and dead-ending etc. NTDC will initially allocate conductor equal to linear length + 2 % allowance. Over & above of the foregoing, if required, shall be estimated by the Contractor itself at the bidding stage and NTDC will allocate the required conductor on Loan/Cash Payment basis, the cost of which must be built-in by the Contractor in his Price. The Contractor will be required to submit all the necessary proofs/documents to establish the consumption of the conductor against the permissible limits.**

9 **An allowance of two percent (2%) for shield wire and one percent (1%) of OPGW and two percent (2%) for lossage of nuts, bolts and washers (for towers only), and one percent (1%) for insulator breakage will be permitted. The allowances specified herein are the maximum permissible limits and in case of wastage less than these limits all excess material shall be returned to NTDC storage yards by the Contractor. For quantities in excess of these limits, the Contractor shall replace the same or reimburse to NTDC as per actual including material cost (CIF/Ex- Works) whichever is applicable as on the date of reconciliation and NTDC overheads, incidental charges & applicable duties etc.**

10 No additional allowance as applicable in item 8 & 9 above shall be admissible in case the proportion of Angle and Suspension towers changes during the project execution.

11 All unused materials of the allocated material are the property of NTDC and shall be returned to NTDC designated storage yards by the Contractor in healthy condition.

12 O&M for the Vehicles shall include Driver's Salary and other expenses; Vehicle's POL (Petroleum, Oil & Lubricants) and all other associated expenses.

13 In case of increase of Tower weights mentioned in Volume-II of Bidding Documents, no additional payment to the Contractor on this account will be made.

14 The Contractor shall provide the rates against each item whether the quantity is not given.

15 Installation of jumper assembly, spacer, etc., at the last tower of the cited lot is included in the respective Contractor's scope.

Signature of Bidder _____

CONDITIONS OF CONTRACT FOR WORKS OF CIVIL ENGINEERING CONSTRUCTION

PART I GENERAL CONDITIONS

WITH FORMS OF TENDER AND AGREEMENT

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PART I: GENERAL CONDITIONS

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PART I - GENERAL CONDITIONS

Definitions and Interpretation

Definitions **1.1** In the Contract (as hereinafter defined) the following words and expressions shall have the meanings hereby assigned to them, except where the context otherwise requires:

(a) (i) "Employer" means the person named as such in Part II of these Conditions and the legal successors in title to such person, but not (except with the consent of the Contractor) any assignee of such person.

(ii) "Contractor" means the person whose tender has been accepted by the Employer and the legal successors in title to such person, but not (except with the consent of the Employer) any assignee of such person.

(iii) "Subcontractor" means any person named in the Contract as a Subcontractor for a part of the Works or any person to whom a part of the Works has been subcontracted with the consent of the Engineer and the legal successors in title to such person, but not any assignee of any such person.

(iv) "Engineer" means the person appointed by the Employer to act as Engineer for the purposes of the Contract and named as such in Part II of these Conditions.

(v) "Engineer's Representative" means a person appointed from time to time by the Engineer under Sub-Clause 2.2.

(b) (i) "Contract" means these Conditions (Parts I and II), the Specification, the Drawings, the Bill of Quantities, the Tender, the Letter of Acceptance, the Contract Agreement (if completed) and such further documents as may be expressly incorporated in the Letter of Acceptance or Contract Agreement (if completed).

(ii) "Specification" means the specification of the Works included in the Contract and any modification thereof or addition thereto made under Clause 51 or submitted by the Contractor and approved by the Engineer.

(iii) "Drawings" means all drawings, calculations and technical information of a like nature provided by the Engineer to the Contractor under the Contract and all drawings, calculations, samples, patterns, models, operation and maintenance manuals and other technical information of a like nature submitted by the Contractor and approved by the Engineer.

(iv) "Bill of Quantities" means the priced and completed bill of quantities forming part of the Tender.

(v) "Tender" means the Contractor's priced offer to the Employer for the execution and completion of the Works and the remedying of any defects therein in accordance with the provisions of the Contract, as accepted by the Letter of Acceptance.

(vi) "Letter of Acceptance" means the formal acceptance by the Employer of the Tender.

(vii) "Contract Agreement" means the contract agreement (if any) referred to in Sub-Clause 9.1.

(viii) "Appendix to Tender" means the appendix comprised in the form of Tender annexed to these Conditions.

(c) (i) "Commencement Date" means the date upon which the Contractor receives the notice to commence issued by the Engineer pursuant to Clause 41.

(ii) "Time for Completion" means the time for completing the execution of and passing the Tests on Completion of the Works or any Section or part thereof as stated in the Contract (or as extended under Clause 44) calculated from the Commencement Date.

(d) (i) "Tests on Completion" means the tests specified in the Contract or otherwise agreed by the Engineer and the Contractor which are to be made by the Contractor before the Works or any Section or part thereof are taken over by the Employer.

(ii) "Taking-Over Certificate" means a certificate issued pursuant to Clause 48.

(e) (i) "Contract Price" means the sum stated in the Letter of Acceptance as payable to the Contractor for the execution and completion of the Works and the remedying of any defects therein in accordance with the provisions of the Contract.

(ii) "Retention Money" means the aggregate of all monies retained by the Employer pursuant to Sub-Clause 60.2(a).

(iii) "Interim Payment Certificate" means any certificate of payment issued by the Engineer other than the Final Payment Certificate.

(iv) "Final Payment Certificate" means the certificate of payment issued by the Engineer pursuant to Sub-Clause 60.8.

(f) (i) "Works" means the Permanent Works and the Temporary Works or either of them as appropriate.

(ii) "Permanent Works" means the permanent works to be executed (including Plant) in accordance with the Contract.

(iii) "Temporary Works" means all temporary works of every kind (other than Contractor's Equipment) required in or about the execution and completion of the Works and the remedying of any defects therein.

(iv) "Plant" means machinery, apparatus and the like intended to form or forming part of the Permanent Works.

(v) "Contractor's Equipment" means all appliances and things of whatsoever nature (other than Temporary Works) required for the execution and completion of the Works and the remedying of any defects therein, but does not include Plant, materials or other things intended to form or forming part of the Permanent Works.

(vi) "Section" means a part of the Works specifically identified in the Contract as a Section.

(vii) "Site" means the places provided by the Employer where the Works are to be executed and any other places as may be specifically designated in the Contract as forming part of the Site.

(g) (i) "cost" means all expenditure properly incurred or to be incurred, whether on or off the Site, including overhead and other charges properly allocable thereto but does not include any allowance for profit.

(ii) "day" means calendar day.

(iii) "foreign currency" means a currency of a country other than that in which the Works are to be located.

(iv) "writing" means any hand-written, type-written, or printed communication, including telex, cable and facsimile transmission.

Headings and Marginal Notes **1.2** The headings and marginal notes in these Conditions shall not be deemed part thereof or be taken into consideration in the interpretation or construction thereof or of the Contract.

Interpretation **1.3** Words importing persons or parties shall include firms and corporations and any organisation having legal capacity.

Singular and Plural **1.4** Words importing the singular only also include the plural and vice versa where the context requires.

Notices, Consents, Approvals, Certificates and Determinations

1.5 Wherever in the Contract provision is made for the giving or issue of any notice, consent, approval, certificate or determination by any person, unless otherwise specified such notice, consent, approval, certificate or determination shall be in writing and the words "notify", "certify" or "determine" shall be construed accordingly. Any such consent, approval, certificate or determination shall not unreasonably be withheld or delayed.

Engineer and Engineer's Representative

Engineer's Duties and Authority

2. 1 (a) The Engineer shall carry out the duties specified in the Contract.

(b) The Engineer may exercise the authority specified in or necessarily to be implied from the Contract, provided, however, that if the Engineer is required, under the terms of his appointment by the Employer, to obtain the specific approval of the Employer before exercising any such authority, particulars of such requirements shall be set out in Part II of these Conditions. Provided further that any requisite approval shall be deemed to have been given by the Employer for any such authority exercised by the Engineer.

(c) 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.

Engineer's Representative

2.2 The Engineer's Representative shall be appointed by and be responsible to the Engineer and shall carry out such duties and exercise such authority as may be delegated to him by the Engineer under Sub-Clause 2.3.

Engineer's Authority to Delegate

2.3 The Engineer may from time to time delegate to the Engineer's Representative any of the duties and authorities vested in the Engineer and he 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 Employer and the Contractor.

Any communication 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. Provided that:

(a) any failure of the Engineer's Representative to disapprove any work, materials or Plant shall not prejudice the authority of the Engineer to disapprove such work, materials or Plant and to give instructions for the rectification thereof; and

(b) if the Contractor questions any communication of the Engineer's Representative he may refer the matter to the Engineer who shall confirm, reverse or vary the contents of such communication.

Appointment of Assistants

2.4 The Engineer or the Engineer's Representative may appoint any number of persons to assist the Engineer's Representative in the carrying out of his duties under Sub-Clause 2.2. He shall notify to the Contractor the names, duties and scope of authority of such persons. Such assistants shall have no authority to issue any instructions to the Contractor save in so far as such instructions may be necessary to enable them to carry out their duties and to secure their acceptance of materials, Plant or workmanship as being in accordance with the Contract, and any instructions given by any of them for those purposes shall be deemed to have been given by the Engineer's Representative.

Instructions in Writing

2.5 Instructions given by the Engineer shall be in writing, provided that if for any reason the Engineer considers it necessary to give any such instruction orally, the Contractor shall comply with such instruction. Confirmation in writing of such oral instruction given by the Engineer, whether before or after the carrying out of the instruction, shall be deemed to be an instruction within the meaning of this Sub-Clause. Provided further that if the Contractor, within 7 days, confirms in writing to the Engineer any oral instruction of the Engineer and such confirmation is not contradicted in writing within 7 days by the Engineer, it shall be deemed to be an instruction of the Engineer.

The provisions of this Sub-Clause shall equally apply to instructions given by the Engineer's Representative and any assistants of the Engineer or the Engineer's Representative appointed pursuant to Sub-Clause 2.4.

Engineer to Act Impartially **2.6** Wherever, under the Contract, the Engineer is required to exercise his discretion by:

(a) giving his decision, opinion or consent,

(b) expressing his satisfaction or approval,

(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. Any such decision, opinion, consent, expression of satisfaction, or approval, determination of value or action may be opened up, reviewed or revised as provided in Clause 67.

Assignment and Subcontracting

Assignment of Contract **3. 1** The Contractor shall not, without the prior consent of the Employer (which consent, notwithstanding the provisions of Sub-Clause 1.5, shall be at the sole discretion of the Employer), assign the Contract or any part thereof, or any benefit or interest therein or thereunder, otherwise than by:

(a) a charge in favour of the Contractor's bankers of any monies due or to become due under the Contract, or

(b) assignment to the Contractor's insurers (in cases where the insurers have discharged the Contractor's loss or liability) of the Contractor's right to obtain relief against any other party liable.

Subcontracting **4. 1** 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. Any such consent shall not relieve the Contractor from any liability or obligation under the Contract and he shall be responsible for the acts, defaults and neglects of any Subcontractor, his agents, servants or workmen as fully as if they were the acts, defaults or neglects of the Contractor, his agents, servants or workmen.

Provided that the Contractor shall not be required to obtain such consent for:

(a) the provision of labour,

(b) the purchase of materials which are in accordance with the standards specified in the Contract, or

(c) the subcontracting of any part of the Works for which the Subcontractor is named in the Contract.

Assignment of Subcontractors' Obligations **4.2** In the event of a Subcontractor having undertaken towards the Contractor in respect of the work executed, or the goods, materials, Plant or services supplied by such Subcontractor, any continuing obligation extending for a period exceeding that of the Defects Liability Period under the Contract, the Contractor shall at any time, after the expiration of such Period, assign to the Employer, at the Employer's request and cost, the benefit of such obligation for the unexpired duration thereof.

Contract Documents

Language/s and Law **5. 1** There is stated in Part II of these Conditions:

(a) the language or languages in which the Contract documents shall be drawn up, and

(b) the country or state the law of which shall apply to the Contract and according to which the Contract shall be construed.

If the said documents are written in more than one language, the language according to which the Contract shall be construed and interpreted is also stated in Part II of these Conditions, being therein designated the "Ruling Language".

Priority of Contract Documents

5.2 The several documents forming the Contract are to be taken as mutually explanatory of one another, but in case of ambiguities or discrepancies the same shall be explained and adjusted by the Engineer who shall thereupon issue to the Contractor instructions thereon and in such event, unless otherwise provided in the Contract, the priority of the documents forming the Contract shall be as follows:

(1) The Contract Agreement (if completed);

(2) The Letter of Acceptance;

(3) The Tender;

(4) Part II of these Conditions;

(5) Part I of these Conditions; and

(6) Any other document forming part of the Contract.

Custody and Supply of Drawings and Documents

6.1 The Drawings shall remain in the sole custody of the Engineer, but two copies thereof shall be provided to the Contractor free of charge. The Contractor shall make at his own cost any further copies required by him. Unless it is strictly necessary for the purposes of the Contract, the Drawings, Specification and other documents provided by the Employer or the Engineer shall not, without the consent of the Engineer, be used or communicated to a third party by the Contractor. Upon issue of the Defects Liability Certificate, the Contractor shall return to the Engineer all Drawings, Specification and other documents provided under the Contract.

The Contractor shall supply to the Engineer four copies of all Drawings, Specification and other documents submitted by the Contractor and approved by the Engineer in accordance with Clause 7, together with a reproducible copy of any material which cannot be reproduced to an equal standard by photocopying. In addition the Contractor shall supply such further copies of such Drawings, Specification and other documents as the Engineer may request in writing for the use of the Employer, who shall pay the cost thereof.

One Copy of Drawings to be Kept on Site

6.2 One copy of the Drawings, provided to or supplied by the Contractor as aforesaid, shall be kept by the Contractor on the Site and the same shall at all reasonable times be available for inspection and use by the Engineer and by any other person authorised by the Engineer in writing.

Disruption of Progress

6.3 The Contractor shall give notice to the Engineer, with a copy to the Employer, whenever planning or execution of the Works is likely to be delayed or disrupted unless any further drawing or instruction is issued by the Engineer within a reasonable time. The notice shall include details of the drawing or instruction required and of why and by when it is required and of any delay or disruption likely to be suffered if it is late.

Delays and Cost of Delay of Drawings

6.4 If, by reason of any failure or inability of the Engineer to issue, within a time reasonable in all the circumstances, any drawing or instruction for which notice has been given by the Contractor in accordance with Sub-Clause 63, the Contractor suffers delay and/or incurs costs then the Engineer shall, after due consultation with the Employer and the Contractor, determine:

(a) any extension of time to which the Contractor is entitled under Clause 44, and

(b) the amount of such costs, which shall be added to the Contract Price,

and shall notify the Contractor accordingly, with a copy to the Employer.

Failure by Contractor to Submit Drawings

6.5 If the failure or inability of the Engineer to issue any drawings or instructions is caused in whole or in part by the failure of the Contractor to submit Drawings, Specification or other documents which he is required to submit under the Contract, the Engineer shall take such failure by the Contractor into account when making his determination pursuant to Sub-Clause 6.4.

Supplementary Drawings and Instructions 7.1 The Engineer shall have authority to issue to the Contractor, from time to time, such supplementary Drawings and instructions as shall be necessary for the purpose of the proper and adequate execution and completion of the Works and the remedying of any defects therein. The Contractor shall carry out and be bound by the same.

Permanent Works Designed by Contractor 7.2 Where the Contract expressly provides that part of the Permanent Works shall be designed by the Contractor, he shall submit to the Engineer, for approval:

(a) such drawings, specifications, calculations and other information as shall be necessary to satisfy the Engineer as to the suitability and adequacy of that design, and

(b) operation and maintenance manuals together with drawings of the Permanent Works as completed, in sufficient detail to enable the Employer to operate, maintain, dismantle, reassemble and adjust the Permanent Works incorporating that design. The Works shall not be considered to be completed for the purposes of taking over in accordance with Clause 48 until such operation and maintenance manuals, together with drawings on completion, have been submitted to and approved by the Engineer.

Responsibility Unaffected by Approval 7.3 Approval by the Engineer, in accordance with Sub-Clause 7.2, shall not relieve the Contractor of any of his responsibilities under the Contract.

General Obligations

Contractor's General Responsibilities 8.1 The Contractor shall, with due care and diligence, design (to the extent provided for by the Contract), execute and complete the Works and remedy any defects therein in accordance with the provisions of the Contract. The Contractor shall provide all superintendence, labour, materials, Plant, Contractor's Equipment and all other things, whether of a temporary or permanent nature, required in and for such design, execution, completion and remedying of any defects, so far as the necessity for providing the same is specified in or is reasonably to be inferred from the Contract.

The Contractor shall give prompt notice to the Engineer, with a copy to the Employer, of any error, omission, fault or other defect in the design of or Specification for the Works which he discovers when reviewing the Contract or executing the Works.

Site Operations and Methods of Construction 8.2 The Contractor shall take full responsibility for the adequacy, stability and safety of all Site operations and methods of construction. Provided that the Contractor shall not be responsible (except as stated hereunder or as may be otherwise agreed) for the design or specification of Permanent Works, or for the design or specification of any Temporary Works not prepared by the Contractor. Where the Contract expressly provides that part of the Permanent Works shall be designed by the Contractor, he shall be fully responsible for that part of such Works, notwithstanding any approval by the Engineer.

Contract Agreement 9.1 The Contractor shall, if called upon so to do, enter into and execute the Contract Agreement, to be prepared and completed at the cost of the Employer, in the form annexed to these Conditions with such modification as may be necessary.

Performance Security 10.1 If the Contract requires the Contractor to obtain security for his proper performance of the Contract, he shall obtain and provide to the Employer such security within 28 days after the receipt of the Letter of Acceptance, in the sum stated in the Appendix to Tender. When providing such security to the Employer, the Contractor shall notify the Engineer of so doing. Such security shall be in the form annexed to these Conditions or in such other form as may be agreed between the Employer and the Contractor. The institution providing such security shall be subject to the approval of the Employer. The cost of complying with the requirements of this Clause shall be borne by the Contractor, unless the Contract otherwise provides.

Period of Validity of Performance Security

10.2 The performance security shall be valid until the Contractor has executed and completed the Works and remedied any defects therein in accordance with the Contract. No claim shall be made against such security after the issue of the Defects Liability Certificate in accordance with Sub-Clause 62.1 and such security shall be returned to the Contractor within 14 days of the issue of the said Defects Liability Certificate.

Claims under Performance Security

10.3 Prior to making a claim under the performance security the Employer shall, in every case, notify the Contractor stating the nature of the default in respect of which the claim is to be made.

Inspection of Site

11.1 The Employer shall have made available to the Contractor, before the submission by the Contractor of the Tender, such data on hydrological and sub-surface conditions as have been obtained by or on behalf of the Employer from investigations undertaken relevant to the Works but the Contractor shall be responsible for his own interpretation thereof.

The Contractor shall be deemed to have inspected and examined the Site and its surroundings and information available in connection therewith and to have satisfied himself (so far as is practicable, having regard to considerations of cost and time) before submitting his Tender, as to:

(a) the form and nature thereof, including the sub-surface conditions,

(b) the hydrological and climatic conditions,

(c) the extent and nature of work and materials necessary for the execution and completion of the Works and the remedying of any defects therein, and

(d) the means of access to the Site and the accommodation he may require,

and, in general, shall be deemed to have obtained all necessary information, subject as above mentioned, as to risks, contingencies and all other circumstances which may influence or affect his Tender.

The Contractor shall be deemed to have based his Tender on the data made available by the Employer and on his own inspection and examination, all as aforementioned.

Sufficiency of Tender

12.1 The Contractor shall be deemed to have satisfied himself as to the correctness and sufficiency of the Tender and of the rates and prices stated in the Bill of Quantities, all of which shall, except insofar as it is otherwise provided in the Contract, cover all his obligations under the Contract (including those in respect of the supply of goods, materials, Plant or services or of contingencies for which there is a Provisional Sum) and all matters and things necessary for the proper execution and completion of the Works and the remedying of any defects therein.

Not Foreseeable Physical Obstructions or Conditions

12.2 If, however, during the execution of the Works the Contractor encounters physical obstructions or physical conditions, other than climatic conditions on the Site, which obstructions or conditions were, in his opinion, not foreseeable by an experienced contractor, the Contractor shall forthwith give notice thereof to the Engineer, with a copy to the Employer. On receipt of such notice, the Engineer shall, if in his opinion such obstructions or conditions could not have been reasonably foreseen by an experienced contractor, after due consultation with the Employer and the Contractor, determine:

(a) any extension of time to which the Contractor is entitled under Clause 44, and

(b) the amount of any costs which may have been incurred by the Contractor by reason of such obstructions or conditions having been encountered, which shall be added to the Contract Price,

and shall notify the Contractor accordingly, with a copy to the Employer. Such determination shall take account of any instruction which the Engineer may issue to the Contractor in connection therewith, and any proper and reasonable measures acceptable to the Engineer which the Contractor may take in the absence of specific instructions from the Engineer.

Work to be in Accordance with Contract **13.1** Unless it is legally or physically impossible, the Contractor shall execute and complete the Works and remedy any defects therein in strict accordance with the Contract to the satisfaction of the Engineer. The Contractor shall comply with and adhere strictly to the Engineer's instructions on any matter, whether mentioned in the Contract or not, touching or concerning the Works. The Contractor shall take instructions only from the Engineer (or his delegate).

Programme to be Submitted **14.1** The Contractor shall, within the time stated in Part II of these Conditions after the date of the Letter of Acceptance, submit to the Engineer for his consent a programme, in such form and detail as the Engineer shall reasonably prescribe, for the execution of the Works. The Contractor shall, whenever required by the Engineer, also provide in writing for his information a general description of the arrangements and methods which the Contractor proposes to adopt for the execution of the Works.

Revised Programme **14.2** If at any time it should appear to the Engineer that the actual progress of the Works does not conform to the programme to which consent has been given under Sub-Clause 14.1, the Contractor shall produce, at the request of the Engineer, a revised programme showing the modifications to such programme necessary to ensure completion of the Works within the Time for Completion.

Cash Flow Estimate to be Submitted **14.3** The Contractor shall, within the time stated in Part II of these Conditions after the date of the Letter of Acceptance, provide to the Engineer for his information a detailed cash flow estimate, in quarterly periods, of all payments to which the Contractor will be entitled under the Contract and the Contractor shall subsequently supply revised cash flow estimates at quarterly intervals, if required to do so by the Engineer.

Contractor not Relieved of Duties or Responsibilities **14.4** The submission to and consent by the Engineer of such programmes or the provision of such general descriptions or cash flow estimates shall not relieve the Contractor of any of his duties or responsibilities under the Contract.

Contractor's Superintendence **15. 1** The Contractor shall provide all necessary superintendence during the execution of the Works and as long thereafter as the Engineer may consider necessary for the proper fulfilling of the Contractor's obligations under the Contract. The Contractor, or a competent and authorised representative approved of by the Engineer, which approval may at any time be withdrawn, shall give his whole time to the superintendence of the Works. Such authorised representative shall receive, on behalf of the Contractor, instructions from the Engineer.

If approval of the representative is withdrawn by the Engineer, the Contractor shall, as soon as is practicable, having regard to the requirement of replacing him as hereinafter mentioned, after receiving notice of such withdrawal, remove the representative from the Works and shall not thereafter employ him again on the Works in any capacity and shall replace him by another representative approved by the Engineer.

Contractor's Employees **16. 1** The Contractor shall provide on the Site in connection with the execution and completion of the Works and the remedying of any defects therein:

(a) only such technical assistants as are skilled and experienced in their respective callings and such foremen and leading hands as are competent to give proper superintendence of the Works, and

(b) such skilled, semi-skilled and unskilled labour as is necessary for the proper and timely fulfilling of the Contractor's obligations under the Contract.

Engineer at Liberty to Object **16.2** The Engineer shall be at liberty to object to and require the Contractor to remove forthwith from the Works any person provided by the Contractor who, in the opinion of the Engineer, misconducts himself, or is incompetent or negligent in the proper performance of his duties, or whose presence on Site is otherwise considered by the Engineer to be undesirable, and such person shall not be again allowed upon the Works without the consent of the Engineer. Any person so removed from the Works shall be replaced as soon as possible.

Setting-out **17. 1** The Contractor shall be responsible for:

(a) the accurate setting-out of the Works in relation to original points, lines and levels of reference given by the Engineer in writing,

(b) the correctness, subject as above mentioned, of the position, levels, dimensions and alignment of all parts of the Works, and

(c) the provision of all necessary instruments, appliances and labour in connection with the foregoing responsibilities.

If, at any time during the execution of the Works, any error appears in the position, levels, dimensions or alignment of any part of the Works, the Contractor, on being required so to do by the Engineer, shall, at his own cost, rectify such error to the satisfaction of the Engineer, unless such error is based on incorrect data supplied in writing by the Engineer, in which case the Engineer shall determine an addition to the Contract Price in accordance with Clause 52 and shall notify the Contractor accordingly, with a copy to the Employer.

The checking of any setting-out or of any line or level by the Engineer shall not in any way relieve the Contractor of his responsibility for the accuracy thereof and the Contractor shall carefully protect and preserve all bench-marks, sight-rails, pegs and other things used in setting-out the Works.

Boreholes and Exploratory Excavation **18.1** If, at any time during the execution of the Works, the Engineer requires the Contractor to make boreholes or to carry out exploratory excavation, such requirement shall be the subject of an instruction in accordance with Clause 51, unless an item or a Provisional Sum in respect of such work is included in the Bill of Quantities.

Safety, Security and Protection of the Environment **19.1** The Contractor shall, throughout the execution and completion of the Works and the remedying of any defects therein:

(a) have full regard for the safety of all persons entitled to be upon the Site and keep the Site (so far as the same is under his control) and the Works (so far as the same are not completed or occupied by the Employer) in an orderly state appropriate to the avoidance of danger to such persons,

(b) provide and maintain at his own cost all lights, guards, fencing, warning signs and watching, when and where necessary or required by the Engineer or by any duly constituted authority, for the protection of the Works or for the safety and convenience of the public or others, and

(c) take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation.

Employer's Responsibilities **19.2** If under Clause 31 the Employer shall carry out work on the Site with his own workmen he shall, in respect of such work:

(a) have full regard to the safety of all persons entitled to be upon the Site, and

(b) keep the Site in an orderly state appropriate to the avoidance of danger to such persons.

If under Clause 31 the Employer shall employ other contractors on the Site he shall require them to have the same regard for safety and avoidance of danger.

Care of Works **20.1** The Contractor shall take full responsibility for the care of the Works and materials and Plant for incorporation therein from the Commencement Date until the date of issue of the Taking-Over Certificate for the whole of the Works, when the responsibility for the said care shall pass to the Employer. Provided that:

(a) if the Engineer issues a Taking-Over Certificate for any Section or part of the Permanent Works the Contractor shall cease to be liable for the care of that Section or part from the date of issue of the Taking-Over Certificate, when the responsibility for the care of that Section or part shall pass to the Employer, and

(b) the Contractor shall take full responsibility for the care of any outstanding Works and materials and Plant for incorporation therein which he undertakes to finish during the Defects Liability Period until such outstanding Works have been completed pursuant to Clause 49.

Responsibility to Rectify Loss or Damage **20.2** If any loss or damage happens to the Works, or any part thereof, or materials or Plant for incorporation therein, during the period for which the Contractor is responsible for the care thereof, from any cause whatsoever, other than the risks defined in Sub-Clause 20.4, the Contractor shall, at his own cost, rectify such loss or damage so that the Permanent Works conform in every respect with the provisions of the Contract to the satisfaction of the Engineer. The Contractor shall also be liable for any loss or damage to the Works occasioned by him in the course of any operations carried out by him for the purpose of complying with his obligations under Clauses 49 and 50.

Loss or Damage Due to Employer's Risks **20.3** In the event of any such loss or damage happening from any of the risks defined in Sub-Clause 20.4, or in combination with other risks, the Contractor shall, if and to the extent required by the Engineer, rectify the loss or damage and the Engineer shall determine an addition to the Contract Price in accordance with Clause 52 and shall notify the Contractor accordingly, with a copy to the Employer. In the case of a combination of risks causing loss or damage any such determination shall take into account the proportional responsibility of the Contractor and the Employer.

Employer's Risks **20.4** The Employer's risks are:

(a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies,

(b) rebellion, revolution, insurrection, or military or usurped power, or civil war,

(c) ionising radiations, or contamination by radio-activity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radio-active toxic explosive or other hazardous properties of any explosive nuclear assembly or nuclear component thereof,

(d) pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds,

(e) riot, commotion or disorder, unless solely restricted to employees of the Contractor or of his Subcontractors and arising from the conduct of the Works,

(f) loss or damage due to the use or occupation by the Employer of any Section or part of the Permanent Works, except as may be provided for in the Contract,

(g) loss or damage to the extent that it is due to the design of the Works, other than any part of the design provided by the Contractor or for which the Contractor is responsible, and

(h) any operation of the forces of nature against which an experienced contractor could not reasonably have been expected to take precautions.

Insurance of Works and Contractor's Equipment **21.1** The Contractor shall, without limiting his or the Employer's obligations and responsibilities under Clause 20, insure:

(a) the Works, together with materials and Plant for incorporation therein, to the full replacement cost (the term "cost" in this context shall include profit),

(b) an additional sum of 15 per cent of such replacement cost, or as may be specified in Part II of these Conditions, to cover any additional costs of and incidental to the rectification of loss or damage including professional fees and the cost of demolishing and removing any part of the Works and of removing debris of whatsoever nature, and

(c) the Contractor's Equipment and other things brought onto the Site by the Contractor, for a sum sufficient to provide for their replacement at the Site.

Scope of Cover **21.2** The insurance in paragraphs (a) and (b) of Sub-Clause 21.1 shall be in the joint names of the Contractor and the Employer and shall cover:

(a) the Employer and the Contractor against all loss or damage from whatsoever cause arising, other than as provided in Sub-Clause 21.4, from the start of work at the Site until the date of issue of the relevant Taking-Over Certificate in respect of the Works or any Section or part thereof as the case may be, and

(b) the Contractor for his liability:

(i) during the Defects Liability Period for loss or damage arising from a cause occurring prior to the commencement of the Defects Liability Period, and

(ii) for loss or damage occasioned by the Contractor in the course of any operations carried out by him for the purpose of complying with his obligations under Clauses 49 and 50.

Responsibility for Amounts not Recovered **21.3** Any amounts not insured or not recovered from the insurers shall be borne by the Employer or the Contractor in accordance with their responsibilities under Clause 20.

Exclusions **21.4** There shall be no obligation for the insurances in Sub-Clause 21.1 to include loss or damage caused by:

(a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies,

(b) rebellion, revolution, insurrection, or military or usurped power, or civil war,

(c) ionising radiations, or contamination by radio-activity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radio-active toxic explosive or other hazardous properties of any explosive nuclear assembly or nuclear component thereof, or

(d) pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds.

Damage to Persons and Property **22.1** The Contractor shall, except if and so far as the Contract provides otherwise, indemnify the Employer against all losses and claims in respect of:

(a) death of or injury to any person, or

(b) loss of or damage to any property (other than the Works),

which may arise out of or in consequence of the execution and completion of the Works and the remedying of any defects therein, and against all claims, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto, subject to the exceptions defined in Sub-Clause 22.2.

Exceptions **22.2** The "exceptions" referred to in Sub-Clause 22.1 are:

(a) the permanent use or occupation of land by the Works, or any part thereof,

(b) the right of the Employer to execute the Works, or any part thereof, on, over, under, in or through any land,

(c) damage to property which is the unavoidable result of the execution and completion of the Works, or the remedying of any defects therein, in accordance with the Contract, and

(d) death of or injury to persons or loss of or damage to property resulting from any act or neglect of the Employer, his agents, servants or other contractors, not being employed by the Contractor, or in respect of any claims, proceedings, damages, costs, charges and expenses in respect thereof or in relation thereto or, where the injury or damage was contributed to by the Contractor, his servants or agents, such part of the said injury or damage as may be just and equitable having regard to the extent of the responsibility of the Employer, his servants or agents or other contractors for the injury or damage.

Indemnity by Employer **22.3** The Employer shall indemnify the Contractor against all claims, proceedings, damages, costs, charges and expenses in respect of the matters referred to in the exceptions defined in Sub-Clause 22.2.

Third Party Insurance (including Employer's Property) **23.1** The Contractor shall, without limiting his or the Employer's obligations and responsibilities under Clause 22, insure, in the joint names of the Contractor and the Employer, against liabilities for death of or injury to any person (other than as provided in Clause 24) or loss of or damage to any property (other than the Works) arising out of the performance of the Contract, other than the exceptions defined in paragraphs (a), (b) and (c) of Sub-Clause 22.2.

Minimum Amount of Insurance **23.2** Such insurance shall be for at least the amount stated in the Appendix to Tender.

Cross Liabilities **23.3** The insurance policy shall include a cross liability clause such that the insurance shall apply to the Contractor and to the Employer as separate insureds.

Accident or Injury to Workmen **24.1** The Employer shall not be liable for or in respect of any damages or compensation payable to any workman or other person in the employment of the Contractor or any Subcontractor, other than death or injury resulting from any act or default of the Employer, his agents or servants. The Contractor shall indemnify and keep indemnified the Employer against all such damages and compensation, other than those for which the Employer is liable as aforesaid, and against all claims, proceedings, damages, costs, charges, and expenses whatsoever in respect thereof or in relation thereto.

Insurance Against Accident to Workmen **24.2** The Contractor shall insure against such liability and shall continue such insurance during the whole of the time that any persons are employed by him on the Works. Provided that, in respect of any persons employed by any Subcontractor, the Contractor's obligations to insure as aforesaid under this Sub-Clause shall be satisfied if the Subcontractor shall have insured against the liability in respect of such persons in such manner that the Employer is indemnified under the policy, but the Contractor shall require such Subcontractor to produce to the Employer, when required, such policy of insurance and the receipt for the payment of the current premium.

Evidence and Terms of Insurances **25.1** The Contractor shall provide evidence to the Employer prior to the start of work at the Site that the insurances required under the Contract have been effected and shall, within 84 days of the Commencement Date, provide the insurance policies to the Employer. When providing such evidence and such policies to the Employer, the Contractor shall notify the Engineer of so doing. Such insurance policies shall be consistent with the general terms agreed prior to the issue of the Letter of Acceptance. The Contractor shall effect all insurances for which he is responsible with insurers and in terms approved by the Employer.

Adequacy of Insurances **25.2** The Contractor shall notify the insurers of changes in the nature, extent or programme for the execution of the Works and ensure the adequacy of the insurances at all times in accordance with the terms of the Contract and shall, when required, produce to the Employer the insurance policies in force and the receipts for payment of the current premiums.

Remedy on Contractor's Failure to Insure **25.3** If the Contractor fails to effect and keep in force any of the insurances required under the Contract, or fails to provide the policies to the Employer within the period required by Sub-Clause 25.1, then and in any such case the Employer may effect and keep in force any such insurances and pay any premium as may be necessary for that purpose and from time to time deduct the amount so paid from any monies due or to become due to the Contractor, or recover the same as a debt due from the Contractor.

Compliance with Policy Conditions **25.4** In the event that the Contractor or the Employer fails to comply with conditions imposed by the insurance policies effected pursuant to the Contract, each shall indemnify the other against all losses and claims arising from such failure.

Compliance with Statutes, Regulations **26.1** The Contractor shall conform in all respects, including by the giving of all notices and the paying of all fees, with the provisions of:

(a) any National or State Statute, Ordinance, or other Law, or any regulation, or bye-law of any local or other duly constituted authority in relation to the execution and completion of the Works and the remedying of any defects therein, and

(b) the rules and regulations of all public bodies and companies whose property or rights are affected or may be affected in any way by the Works,

and the Contractor shall keep the Employer indemnified against all penalties and liability of every kind for breach of any such provisions. Provided always that the Employer shall be responsible for obtaining any planning, zoning or other similar permission required for the Works to proceed and shall indemnify the Contractor in accordance with Sub-Clause 22.3.

Fossils **27.1** All fossils, coins, articles of value or antiquity and structures and other remains or things of geological or archaeological interest discovered on the Site shall, as between the Employer and the Contractor, be deemed to be the absolute property of the Employer. The Contractor shall take reasonable precautions to prevent his workmen or any other persons from removing or damaging any such article or thing and shall, immediately upon discovery thereof and before removal, acquaint the Engineer of such discovery and carry out the Engineer's instructions for dealing with the same. If, by reason of such instructions, the Contractor suffers delay and/or incurs costs then the Engineer shall, after due consultation with the Employer and the Contractor, determine:

(a) any extension of time to which the Contractor is entitled under Clause 44, and

(b) the amount of such costs, which shall be added to the Contract Price,

and shall notify the Contractor accordingly, with a copy to the Employer.

Patent Rights **28.1** The Contractor shall save harmless and indemnify the Employer from and against all claims and proceedings for or on account of infringement of any patent rights, design trademark or name or other protected rights in respect of any Contractor's Equipment, materials or Plant used for or in connection with or for incorporation in the Works and from and against all damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto, except where such infringement results from compliance with the design or Specification provided by the Engineer.

Royalties **28.2** Except where otherwise stated, the Contractor shall pay all tonnage and other royalties, rent and other payments or compensation, if any, for getting stone, sand, gravel, clay or other materials required for the Works.

Interference with Traffic and Adjoining Properties **29.1** All operations necessary for the execution and completion of the Works and the remedying of any defects therein shall, so far as compliance with the requirements of the Contract permits, be carried on so as not to interfere unnecessarily or improperly with:

(a) the convenience of the public, or

(b) the access to, use and occupation of public or private roads and footpaths to or of properties whether in the possession of the Employer or of any other person.

The Contractor shall save harmless and indemnify the Employer in respect of all claims, proceedings, damages, costs, charges and expenses whatsoever arising out of, or in relation to, any such matters insofar as the Contractor is responsible therefor.

Avoidance of Damage to Roads **30.1** The Contractor shall use every reasonable means to prevent any of the roads or bridges communicating with or on the routes to the Site from being damaged or injured by any traffic of the Contractor or any of his Subcontractors and, in particular, shall select routes, choose and use vehicles and restrict and distribute loads so that any such extraordinary traffic as will inevitably arise from the moving of materials, Plant, Contractor's Equipment or Temporary Works from and to the Site shall be limited, as far as reasonably possible, and so that no unnecessary damage or injury may be occasioned to such roads and bridges.

Transport of Contractor's Equipment or Temporary Works **30.2** Save insofar as the Contract otherwise provides, the Contractor shall be responsible for and shall pay the cost of strengthening any bridges or altering or improving any road communicating with or on the routes to the Site to facilitate the movement of Contractor's Equipment or Temporary Works and the Contractor shall indemnify and keep indemnified the Employer against all claims for damage to any such road or bridge caused by such movement, including such claims as may be made directly against the Employer, and shall negotiate and pay all claims arising solely out of such damage.

Transport of Materials or Plant **30.3** If, notwithstanding Sub-Clause 30.1, any damage occurs to any bridge or road communicating with or on the routes to the Site arising from the transport of materials or Plant, the Contractor shall notify the Engineer with a copy to the Employer, as soon as he becomes aware of such damage or as soon as he receives any claim from the authority entitled to make such claim. Where under any law or regulation the haulier of such materials or Plant is required to indemnify the road authority against damage the Employer shall not be liable for any costs, charges or expenses in respect thereof or in relation thereto. In other cases the Employer shall negotiate the settlement of and pay all sums due in respect of such claim and shall indemnify the Contractor in respect thereof and in respect of all claims, proceedings, damages, costs, charges and expenses in relation thereto. Provided that if and so far as any such claim or part thereof is, in the opinion of the Engineer, due to any failure on the part of the Contractor to observe and perform his obligations under Sub-Clause 30.1, then the amount, determined by the Engineer, after due consultation with the Employer and the Contractor, to be due to such failure shall be recoverable from the Contractor by the Employer and may be deducted by the Employer from any monies due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly, with a copy to the Employer. Provided also that the Employer shall notify the Contractor whenever a settlement is to be negotiated and, where any amount may be due from the Contractor, the Employer shall consult with the Contractor before such settlement is agreed.

Waterborne Traffic **30.4** Where the nature of the Works is such as to require the use by the Contractor of waterborne transport the foregoing provisions of this Clause shall be construed as though "road" included a lock, dock, sea wall or other structure related to a waterway and "vehicle" included craft, and shall have effect accordingly.

Opportunities for Other Contractors **31.1** The Contractor shall, in accordance with the requirements of the Engineer, afford all reasonable opportunities for carrying out their work to:

(a) any other contractors employed by the Employer and their workmen,

(b) the workmen of the Employer, and

(c) the workmen of any duly constituted authorities who may be employed in the execution on or near the Site of any work not included in the Contract or of any contract which the Employer may enter into in connection with or ancillary to the Works.

Facilities for Other Contractors **31.2** If, however, pursuant to Sub-Clause 31.1 the Contractor shall, on the written request of the Engineer:

(a) make available to any such other contractor, or to the Employer or any such authority, any roads or ways for the maintenance of which the Contractor is responsible,

(b) permit the use, by any such, of Temporary Works or Contractor's Equipment on the Site, or

(c) provide any other service of whatsoever nature for any such,

the Engineer shall determine an addition to the Contract Price in accordance with Clause 52 and shall notify the Contractor accordingly, with a copy to the Employer.

Contractor to Keep Site Clear **32.1** During the execution of the Works the Contractor shall keep the Site reasonably free from all unnecessary obstruction and shall store or dispose of any Contractor's Equipment and surplus materials and clear away and remove from the Site any wreckage, rubbish or Temporary Works no longer required.

Clearance of Site on Completion **33.1** Upon the issue of any Taking-Over Certificate the Contractor shall clear away and remove from that part of the Site to which such Taking-Over Certificate relates all Contractor's Equipment, surplus material, rubbish and Temporary Works of every kind, and leave such part of the Site and Works clean and in a workmanlike condition to the satisfaction of the Engineer. Provided that the Contractor shall be entitled to retain on Site, until the end of the Defects Liability Period, such materials, Contractor's Equipment and Temporary Works as are required by him for the purpose of fulfilling his obligations during the Defects Liability Period.

Labour

Engagement of Staff and Labour **34.1** The Contractor shall, unless otherwise provided in the Contract, make his own arrangements for the engagement of all staff and labour, local or other, and for their payment, housing, feeding and transport.

Returns of Labour and Contractor's Equipment **35.1** The Contractor shall, if required by the Engineer, deliver to the Engineer a return in detail, in such form and at such intervals as the Engineer may prescribe, showing the staff and the numbers of the several classes of labour from time to time employed by the Contractor on the Site and such information respecting Contractor's Equipment as the Engineer may require.

Materials, Plant and Workmanship

Quality of Materials, Plant and Workmanship **36.1** All materials, Plant and workmanship shall be:

(a) of the respective kinds described in the Contract and in accordance with the Engineer's instructions, and

(b) subjected from time to time to such tests as the Engineer may require at the place of manufacture, fabrication or preparation, or on the Site or at such other place or places as may be specified in the Contract, or at all or any of such places.

The Contractor shall provide such assistance, labour, electricity, fuels, stores, apparatus and instruments as are normally required for examining, measuring and testing any materials or Plant and shall supply samples of materials, before incorporation in the Works, for testing as may be selected and required by the Engineer.

Cost of Samples **36.2** All samples shall be supplied by the Contractor at his own cost if the supply thereof is clearly intended by or provided for in the Contract.

Cost of Tests **36.3** The cost of making any test shall be borne by the Contractor if such test is:

(a) clearly intended by or provided for in the Contract, or

(b) particularised in the Contract (in cases only of a test under load or of a test to ascertain whether the design of any finished or partially finished work is appropriate for the purposes which it was intended to fulfil) in sufficient detail to enable the Contractor to price or allow for the same in his Tender.

Cost of Tests not Provided for **36.4** If any test required by the Engineer which is:

(a) not so intended by or provided for,

(b) (in the cases above mentioned) not so particularised, or

(c) (though so intended or provided for) required by the Engineer to be carried out at any place other than the Site or the place of manufacture, fabrication or preparation of the materials or Plant tested,

shows the materials, Plant or workmanship not to be in accordance with the provisions of the Contract to the satisfaction of the Engineer, then the cost of such test shall be borne by the Contractor, but in any other case Sub-Clause 36.5 shall apply.

Engineer's Determination where Tests not Provided for **36.5** Where, pursuant to Sub-Clause 36.4, this Sub-Clause applies the Engineer shall, after due consultation with the Employer and the Contractor, determine:

(a) any extension of time to which the Contractor is entitled under Clause 44, and

(b) the amount of such costs, which shall be added to the Contract Price,

and shall notify the Contractor accordingly, with a copy to the Employer.

Inspection of Operations **37.1** The Engineer, and any person authorised by him, shall at all reasonable times have access to the Site and to all workshops and places where materials or Plant are being manufactured, fabricated or prepared for the Works and the Contractor shall afford every facility for and every assistance in obtaining the right to such access.

Inspection and Testing **37.2** The Engineer shall be entitled, during manufacture, fabrication or preparation to inspect and test the materials and Plant to be supplied under the Contract. If materials or Plant are being manufactured, fabricated or prepared in workshops or places other than those of the Contractor, the Contractor shall obtain permission for the Engineer to carry out such inspection and testing in those workshops or places. Such inspection or testing shall not release the Contractor from any obligation under the Contract.

Dates for Inspection and Testing **37.3** The Contractor shall agree with the Engineer on the time and place for the inspection or testing of any materials or Plant as provided in the Contract. The Engineer shall give the Contractor not less than 24 hours notice of his intention to carry out the inspection or to attend the tests. If the Engineer, or his duly authorised representative, does not attend on the date agreed, the Contractor may, unless otherwise instructed by the Engineer, proceed with the tests, which shall be deemed to have been made in the presence of the Engineer. The Contractor shall forthwith forward to the Engineer duly certified copies of the test readings. If the Engineer has not attended the tests, he shall accept the said readings as accurate.

Rejection **37.4** If, at the time and place agreed in accordance with Sub-Clause 37.3, the materials or Plant are not ready for inspection or testing or if, as a result of the inspection or testing referred to in this Clause, the Engineer determines that the materials or Plant are defective or otherwise not in accordance with the Contract, he may reject the materials or Plant and shall notify the Contractor thereof immediately. The notice shall state the Engineer's objections with reasons. The Contractor shall then promptly make good the defect or ensure that rejected materials or Plant comply with the Contract. If the Engineer so requests, the tests of rejected materials or Plant shall be made or repeated under the same terms and conditions. All costs incurred by the Employer by the repetition of the tests shall, after due consultation with the Employer and the Contractor, be determined by the Engineer and shall be recoverable from the Contractor by the Employer and may be deducted from any monies due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly, with a copy to the Employer.

Independent Inspection **37.5** The Engineer may delegate inspection and testing of materials or Plant to an independent inspector. Any such delegation shall be effected in accordance with Sub-Clause 2.4 and for this purpose such independent inspector shall be considered as an assistant of the Engineer. Notice of such appointment (not being less than 14 days) shall be given by the Engineer to the Contractor.

Examination of Work before Covering up **38.1** No part of the Works shall be covered up or put out of view without the approval of the Engineer and the Contractor shall afford full opportunity for the Engineer to examine and measure any such part of the Works which is about to be covered up or put out of view and to examine foundations before any part of the Works is placed thereon. The Contractor shall give notice to the Engineer whenever any such part of the Works or foundations is or are ready or about to be ready for examination and the Engineer shall, without unreasonable delay, unless he considers it unnecessary and advises the Contractor accordingly, attend for the purpose of examining and measuring such part of the Works or of examining such foundations.

Uncovering and Making Openings **38.2** The Contractor shall uncover any part of the Works or make openings in or through the same as the Engineer may from time to time instruct and shall reinstate and make good such part. If any such part has been covered up or put out of view after compliance with the requirement of Sub-Clause 38.1 and is found to be executed in accordance with the Contract, the Engineer shall, after due consultation with the Employer and the Contractor, determine the amount of the Contractor's costs in respect of such of uncovering, making openings in or through, reinstating and making good the same, which shall be added to the Contract Price, and shall notify the Contractor accordingly, with a copy to the Employer. In any other case all costs shall be borne by the Contractor.

Removal of Improper Work, Materials or Plant **39.1** The Engineer shall have authority to issue instructions from time to time, for:

(a) the removal from the Site, within such time or times as may be specified in the instruction, of any materials or Plant which, in the opinion of the Engineer, are not in accordance with the Contract,

(b) the substitution of proper and suitable materials or Plant, and

(c) the removal and proper re-execution, notwithstanding any previous test thereof or interim payment therefor, of any work which, in respect of

(i) materials, Plant or workmanship, or

(ii) design by the Contractor or for which he is responsible,

is not, in the opinion of the Engineer, in accordance with the Contract.

Default of Contractor in Compliance **39.2** In case of default on the part of the Contractor in carrying out such instruction within the time specified therein or, if none, within a reasonable time, the Employer shall be entitled to employ and pay other persons to carry out the same and all costs consequent thereon or incidental thereto shall, after due consultation with the Employer and the Contractor, be determined by the Engineer and shall be recoverable from the Contractor by the Employer, and may be deducted by the Employer from any monies due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly, with a copy to the Employer.

Suspension

Suspension of Work **40. 1** The Contractor shall, on the instructions of the Engineer, suspend the progress of the Works or any part thereof for such time and in such manner as the Engineer may consider necessary and shall, during such suspension, properly protect and secure the Works or such part thereof so far as is necessary in the opinion of the Engineer. Unless such suspension is:

(a) otherwise provided for in the Contract,

(b) necessary by reason of some default of or breach of contract by the Contractor or for which he is responsible,

(c) necessary by reason of climatic conditions on the Site, or

(d) necessary for the proper execution of the Works or for the safety of the Works or any part thereof (save to the extent that such necessity arises from any act or default by the Engineer or the Employer or from any of the risks defined in Sub-Clause 20.4),

Sub-Clause 40.2 shall apply.

Engineer's Determination following Suspension **40.2** Where, pursuant to Sub-Clause 40.1, this Sub-Clause applies the Engineer shall, after due consultation with the Employer and the Contractor, determine:

(a) any extension of time to which the Contractor is entitled under Clause 44, and

(b) the amount, which shall be added to the Contract Price, in respect of the cost incurred by the Contractor by reason of such suspension,

and shall notify the Contractor accordingly, with a copy to the Employer.

Suspension lasting more than 84 Days **40.3** If the progress of the Works or any part thereof is suspended on the instructions of the Engineer and if permission to resume work is not given by the Engineer within a period of 84 days from the date of suspension then, unless such suspension is within paragraph (a), (b), (c) or (d) of Sub-Clause 40.1, the Contractor may give notice to the Engineer requiring permission, within 28 days from the receipt thereof, to proceed with the Works or that part thereof in regard to which progress is suspended. If, within the said time, such permission is not granted, the Contractor may, but is not bound to, elect to treat the suspension, where it affects part only of the Works, as an omission of such part under Clause 51 by giving a further notice to the Engineer to that effect, or, where it affects the whole of the Works, treat the suspension as an event of default by the Employer and terminate his employment under the Contract in accordance with the provisions of Sub-Clause 69.1, whereupon the provisions of Sub-Clauses 69.2 and 69.3 shall apply.

Commencement and Delays

Commencement of Works **41.1** The Contractor shall commence the Works as soon as is reasonably possible after the receipt by him of a notice to this effect from the Engineer, which notice shall be issued within the time stated in the Appendix to Tender after the date of the Letter of Acceptance. Thereafter, the Contractor shall proceed with the Works with due expedition and without delay.

Possession of Site and Access Thereto **42.1** Save insofar as the Contract may prescribe:

(a) the extent of portions of the Site of which the Contractor is to be given possession from time to time,

(b) the order in which such portions shall be made available to the Contractor,

and, subject to any requirement in the Contract as to the order in which the Works shall be executed, the Employer will, with the Engineer's notice to commence the Works, give to the Contractor possession of

(c) so much of the Site, and

(d) such access as, in accordance with the Contract, is to be provided by the Employer as may be required to enable the Contractor to commence and proceed with the execution of the Works in accordance with the programme referred to in Clause 14, if any, and otherwise in accordance with such reasonable proposals as the Contractor shall, by notice to the Engineer with a copy to the Employer, make. The Employer will, from time to time as the Works proceed, give to the Contractor possession of such further portions of the Site as may be required to enable the Contractor to proceed with the execution of the Works with due dispatch in accordance with such programme or proposals, as the case may be.

Failure to Give Possession **42.2** If the Contractor suffers delay and/or incurs costs from failure on the part of the Employer to give possession in accordance with the terms of Sub-Clause 42. 1, the Engineer shall, after due consultation with the Employer and the Contractor, determine:

(a) any extension of time to which the Contractor is entitled under Clause 44, and

(b) the amount of such costs, which shall be added to the Contract Price,

and shall notify the Contractor accordingly, with a copy to the Employer.

Rights of Way and Facilities **42.3** The Contractor shall bear all costs and charges for special or temporary rights of way required by him in connection with access to the Site. The Contractor shall also provide at his own cost any additional facilities outside the Site required by him for the purposes of the Works.

Time for Completion **43.1** The whole of the Works and, if applicable, any Section required to be completed within a particular time as stated in the Appendix to Tender, shall be completed, in accordance with the provisions of Clause 48, within the time stated in the Appendix to Tender for the whole of the Works or the Section (as the case may be), calculated from the Commencement Date, or such extended time as may be allowed under Clause 44.

Extension of Time for Completion **44.1** In the event of:

(a) the amount or nature of extra or additional work,

(b) any cause of delay referred to in these Conditions,

(c) exceptionally adverse climatic conditions,

(d) any delay, impediment or prevention by the Employer, or

(e) other special circumstances which may occur, other than through a default of or breach of contract by the Contractor or for which he is responsible,

being such as fairly to entitle the Contractor to an extension of the Time for Completion of the Works, or any Section or part thereof, the Engineer shall, after due consultation with the Employer and the Contractor, determine the amount of such extension and shall notify the Contractor accordingly, with a copy to the Employer.

Contractor to Provide Notification and Detailed Particulars **44.2** Provided that the Engineer is not bound to make any determination unless the Contractor has

(a) within 28 days after such event has first arisen notified the Engineer with a copy to the Employer, and

(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.

Interim Determination of Extension **44.3** Provided also that where an event has a continuing effect such that it is not practicable for the Contractor to submit detailed particulars within the period of 28 days referred to in Sub-Clause 44.2(b), he shall nevertheless be entitled to an extension of time provided that he has submitted to the Engineer interim particulars at intervals of not more than 28 days and final particulars within 28 days of the end of the effects resulting from the event. On receipt of such interim particulars, the Engineer shall, without undue delay, make an interim determination of extension of time and, on receipt of the final particulars, the Engineer shall review all the circumstances and shall determine an overall extension of time in regard to the event. In both such cases the Engineer shall make his determination after due consultation with the Employer and the Contractor and shall notify the Contractor of the determination, with a copy to the Employer. No final review shall result in a decrease of any extension of time already determined by the Engineer.

Restriction on Working Hours **45.1** Subject to any provision to the contrary contained in the Contract, none of the Works shall, save as hereinafter provided, be carried on during the night or on locally recognised days of rest without the consent of the Engineer, except when work is unavoidable or absolutely 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. Provided that the provisions of this Clause shall not be applicable in the case of any work which it is customary to carry out by multiple shifts.

Rate of Progress **46.1** 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 Engineer, too slow to comply with the Time for Completion, the Engineer shall so notify the Contractor who shall thereupon take such steps as are necessary, subject to the consent of the 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 Engineer under this Clause, the Contractor considers that it is necessary to do any work at night or on locally recognised days of rest, he shall be entitled to seek the consent of the Engineer so to do. Provided that if any steps, taken by the Contractor in meeting his obligations under this Clause, involve the Employer in additional supervision costs, such costs shall, after due consultation with the Employer and the Contractor, be determined by the Engineer and shall be recoverable from the Contractor by the Employer, and may be deducted by the Employer from any monies due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly, with a copy to the Employer.

Liquidated Damages for Delay **47.1** If the Contractor fails to comply with the Time for Completion in accordance with Clause 48, for the whole of the Works or, if applicable, any Section within the relevant time prescribed by Clause 43, then the Contractor shall pay to the Employer the relevant sum stated in the Appendix to Tender as liquidated damages for such default and not as a penalty (which sum shall be the only monies due from the Contractor for such default) for every day or part of a day which shall elapse between the relevant Time for Completion and the date stated in a Taking-Over Certificate of the whole of the Works or the relevant Section, subject to the applicable limit stated in the Appendix to Tender. The Employer may, without prejudice to any other method of recovery, 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.

Reduction of Liquidated Damages **47.2** If, before the Time for Completion of the whole of the Works or, if applicable, any Section, a Taking-Over Certificate has been issued for any part of the Works or of a Section, the liquidated damages for delay in completion of the remainder of the Works or of that Section shall, for any period of delay after the date stated in such Taking-Over Certificate, and in the absence of alternative provisions in the Contract, be reduced in the proportion which the value of the part so certified bears to the value of the whole of the Works or Section, as applicable. The provisions of this Sub-Clause shall only apply to the rate of liquidated damages and shall not affect the limit thereof.

Taking-Over Certificate **48.1** When the whole of the Works have been substantially completed and have satisfactorily passed any Tests on Completion prescribed by the Contract, the Contractor may give a notice to that effect to the Engineer, with a copy to the Employer, accompanied by a written undertaking to finish with due expedition any outstanding work during the Defects Liability Period. Such notice and undertaking shall be deemed to be a request by the Contractor for the Engineer to issue a Taking-Over Certificate in respect of the Works. The Engineer shall, within 21 days of the date of delivery of such notice, either issue to the Contractor, with a copy to the Employer, a Taking-Over Certificate, stating the date on which, in his opinion, the Works were substantially completed in accordance with the Contract, or give instructions in writing to the Contractor specifying all the work which, in the Engineer's opinion, is required to be done by the Contractor before the issue of such Certificate. The Engineer shall also notify the Contractor of any defects in the Works affecting substantial completion that may appear after such instructions and before completion of the Works specified therein. The Contractor shall be entitled to receive such Taking-Over Certificate within 21 days of completion, to the satisfaction of the Engineer, of the Works so specified and remedying any defects so notified.

Taking Over of Sections or Parts **48.2** Similarly, in accordance with the procedure set out in Sub-Clause 48.1, the Contractor may request and the Engineer shall issue a Taking-Over Certificate in respect of:

(a) any Section in respect of which a separate Time for Completion is provided in the Appendix to Tender,

(b) any substantial part of the Permanent Works which has been both completed to the satisfaction of the Engineer and, otherwise than as provided for in the Contract, occupied or used by the Employer, or

(c) any part of the Permanent Works which the Employer has elected to occupy or use prior to completion (where such prior occupation or use is not provided for in the Contract or has not been agreed by the Contractor as a temporary measure).

Substantial Completion of Parts **48.3** If any part of the Permanent Works has been substantially completed and has satisfactorily passed any Tests on Completion prescribed by the Contract, the Engineer may issue a Taking-Over Certificate in respect of that part of the Permanent Works before completion of the whole of the Works and, upon the issue of such Certificate, the Contractor shall be deemed to have undertaken to complete with due expedition any outstanding work in that part of the Permanent Works during the Defects Liability Period.

Surfaces Requiring Reinstatement **48.4** Provided that a Taking-Over Certificate given in respect of any Section or part of the Permanent Works before completion of the whole of the Works shall not be deemed to certify completion of any ground or surfaces requiring reinstatement, unless such Taking-Over Certificate shall expressly so state.

Defects Liability

Defects Liability Period **49.1** In these Conditions the expression "Defects Liability Period" shall mean the defects liability period named in the Appendix to Tender, calculated from:

(a) the date of completion of the Works certified by the Engineer in accordance with Clause 48, or

(b) in the event of more than one certificate having been issued by the Engineer under Clause 48, the respective dates so certified,

and in relation to the Defects Liability Period the expression "the Works" shall be construed accordingly.

Completion of Outstanding Work and Remedying Defects **49.2** To the intent that the Works shall, at or as soon as practicable after the expiration of the Defects Liability Period, be delivered to the Employer in the condition required by the Contract, fair wear and tear excepted, to the satisfaction of the Engineer, the Contractor shall:

(a) complete the work, if any, outstanding on the date stated in the Taking-Over Certificate as soon as practicable after such date, and

(b) execute all such work of amendment, reconstruction, and remedying defects, shrinkages or other faults as the Engineer may, during the Defects Liability Period or within 14 days after its expiration, as a result of an inspection made by or on behalf of the Engineer prior to its expiration, instruct the Contractor to execute.

Cost of Remedying Defects **49.3** All work referred to in Sub-Clause 49.2 (b) shall be executed by the Contractor at his own cost if the necessity thereof is, in the opinion of the Engineer, due to:

(a) the use of materials, Plant or workmanship not in accordance with the Contract,

(b) where the Contractor is responsible for the design of part of the Permanent Works, any fault in such design, or

(c) the neglect or failure on the part of the Contractor to comply with any obligation, expressed or implied, on the Contractor's part under the Contract.

If, in the opinion of the Engineer, such necessity is due to any other cause, he shall determine an addition to the Contract Price in accordance with Clause 52 and shall notify the Contractor accordingly, with a copy to the Employer.

Contractor's Failure to Carry Out Instructions **49.4** In case of default on the part of the Contractor in carrying out such instruction within a reasonable time, the Employer shall be entitled to employ and pay other persons to carry out the same and if such work is work which, in the opinion of the Engineer, the Contractor was liable to do at his own cost under the Contract, then all costs consequent thereon or incidental thereto shall, after due consultation with the Employer and the Contractor, be determined by the Engineer and shall be recoverable from the Contractor by the Employer, and may be deducted by the Employer from any monies due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly, with a copy to the Employer.

Contractor to Search **50.1** If any defect, shrinkage or other fault in the Works appears at any time prior to the end of the Defects Liability Period, the Engineer may instruct the Contractor, with copy to the Employer, to search under the directions of the Engineer for the cause thereof. Unless such defect, shrinkage or other fault is one for which the Contractor is liable under the Contract, the Engineer shall, after due consultation with the Employer and the Contractor, determine the amount in respect of the costs of such search incurred by the Contractor, which shall be added to the Contract Price and shall notify the Contractor accordingly, with a copy to the Employer. If such defect, shrinkage or other fault is one for which the Contractor is liable, the cost of the work carried out in searching as aforesaid shall be borne by the Contractor and he shall in such case remedy such defect, shrinkage or other fault at his own cost in accordance with the provisions of Clause 49.

Alterations, Additions and Omissions

Variations **51.1** The Engineer shall make any variation of the form, quality or quantity of the Works or any part thereof that may, in his opinion, be necessary and for that purpose, or if for any other reason it shall, in his opinion, be appropriate, he shall have the authority to instruct the Contractor to do and the Contractor shall do any of the following:

(a) increase or decrease the quantity of any work included in the Contract,

(b) omit any such work (but not if the omitted work is to be carried out by the Employer or by another contractor),

(c) change the character or quality or kind of any such work,

(d) change the levels, lines, position and dimensions of any part of the Works,

(e) execute additional work of any kind necessary for the completion of the Works, or

(f) change any specified sequence or timing of construction of any part of the Works.

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 52. 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.

Instructions for Variations **51.2** The Contractor shall not make any such variation without an instruction of the Engineer. Provided that no instruction shall be required for increase or decrease in the quantity of any work where such increase or decrease is not the result of an instruction given under this Clause, but is the result of the quantities exceeding or being less than those stated in the Bill of Quantities.

Valuation of Variations **52.1** All variations referred to in Clause 51 and any additions to the Contract Price which are required to be determined in accordance with Clause 52 (for the purposes of this Clause referred to as "varied work"), shall be valued at the rates and prices set out in the Contract if, in the opinion of the Engineer, the same shall be applicable. If the Contract does not contain any rates or prices applicable to the varied work, the rates and prices in the Contract shall be used as the basis for valuation so far as may be reasonable, failing which, after due consultation by the Engineer with the Employer and the Contractor, suitable rates or prices shall be agreed upon between the Engineer and the Contractor. In the event of disagreement the Engineer shall fix such rates or prices as are, in his opinion, appropriate and shall notify the Contractor accordingly, with a copy to the Employer. Until such time as rates or prices are agreed or fixed, the Engineer shall determine provisional rates or prices to enable on-account payments to be included in certificates issued in accordance with Clause 60.

Power of Engineer to Fix Rates **52.2** Provided that if the nature or amount of any varied work relative to the nature or amount of the whole of the Works or to any part thereof, is such that, in the opinion of the Engineer, the rate or price contained in the Contract for any item of the Works is, by reason of such varied work, rendered inappropriate or inapplicable, then, after due consultation by the Engineer with the Employer and the Contractor, a suitable rate or price shall be agreed upon between the Engineer and the Contractor. In the event of disagreement the Engineer shall fix such other rate or price as is, in his opinion, appropriate and shall notify the Contractor accordingly, with a copy to the Employer. Until such time as rates or prices are agreed or fixed, the Engineer shall determine provisional rates or prices to enable on-account payments to be included in certificates issued in accordance with Clause 60.

Provided also that no varied work instructed to be done by the Engineer pursuant to Clause 51 shall be valued under Sub-Clause 52.1 or under this Sub-Clause unless, within 14 days of the date of such instruction and, other than in the case of omitted work, before the commencement of the varied work, notice shall have been given either:

(a) by the Contractor to the Engineer of his intention to claim extra payment or a varied rate or price, or

(b) by the Engineer to the Contractor of his intention to vary a rate or price.

Variations Exceeding 15 per cent **52.3** If, on the issue of the Taking-Over Certificate for the whole of the Works, it is found that as a result of:

(a) all varied work valued under Sub-Clauses 52.1 and 52.2, and

(b) all adjustments upon measurement of the estimated quantities set out in the Bill of Quantities, excluding Provisional Sums, dayworks and adjustments of price made under Clause 70,

but not from any other cause, there have been additions to or deductions from the Contract Price which taken together are in excess of 15 per cent of the "Effective Contract Price" (which for the purposes of this Sub-Clause shall mean the Contract Price, excluding Provisional Sums and allowance for dayworks, if any) then and in such event (subject to any action already taken under any other Sub-Clause of this Clause), after due consultation by the Engineer with the Employer and the Contractor, there shall be added to or deducted from the Contract Price such further sum as may be agreed between the Contractor and the Engineer or, failing agreement, determined by the Engineer having regard to the Contractor's Site and general overhead costs of the Contract. The Engineer shall notify the Contractor of any determination made under this Sub-Clause, with a copy to the Employer. Such sum shall be based only on the amount by which such additions or deductions shall be in excess of 15 per cent of the Effective Contract Price.

Daywork **52.4** The Engineer may, if in his opinion it is necessary or desirable, issue an instruction that any varied work shall be executed on a daywork basis. The Contractor shall then be paid for such varied work under the terms set out in the daywork schedule included in the Contract and at the rates and prices affixed thereto by him in the Tender.

The Contractor shall furnish to the Engineer such receipts or other vouchers as may be necessary to prove the amounts paid and, before ordering materials, shall submit to the Engineer quotations for the same for his approval.

In respect of such of the Works executed on a daywork basis, the Contractor shall, during the continuance of such work, deliver each day to the Engineer an exact list in duplicate of the names, occupation and time of all workmen employed on such work and a statement, also in duplicate, showing the description and quantity of all materials and Contractor's Equipment used thereon or therefor other than Contractor's Equipment which is included in the percentage addition in accordance with such daywork schedule. One copy of each list and statement will, if correct, or when agreed, be signed by the Engineer and returned to the Contractor.

At the end of each month the Contractor shall deliver to the Engineer a priced statement of the labour, materials and Contractor's Equipment, except as aforesaid, used and the Contractor shall not be entitled to any payment unless such lists and statements have been fully and punctually rendered. Provided always that if the Engineer considers that for any reason the sending of such lists or statements by the Contractor, in accordance with the foregoing provision, was impracticable he shall nevertheless be entitled to authorise payment for such work, either as daywork, on being satisfied as to the time employed and the labour, materials and Contractor's Equipment used on such work, or at such value therefor as shall, in his opinion, be fair and reasonable.

Procedure for Claims

Notice of Claims **53.1** Notwithstanding any other provision of the Contract, if the Contractor intends to claim any additional payment pursuant to any Clause of these Conditions or otherwise, he shall give notice of his intention to the Engineer, with a copy to the Employer, within 28 days after the event giving rise to the claim has first arisen.

Contemporary Records **53.2** Upon the happening of the event referred to in Sub-Clause 53.1, the Contractor shall keep such contemporary records as may reasonably be necessary to support any claim he may subsequently wish to make. Without necessarily admitting the Employer's liability, the Engineer shall, on receipt of a notice under Sub-Clause 53.1, inspect such contemporary records and may instruct the Contractor to keep

any further contemporary records as are reasonable and may be material to the claim of which notice has been given. The Contractor shall permit the Engineer to inspect all records kept pursuant to this Sub-Clause and shall supply him with copies thereof as and when the Engineer so instructs.

Substantiation of Claims **53.3** Within 28 days, or such other reasonable time as may be agreed by the Engineer, of giving notice under Sub-Clause 53.1, the Contractor shall send to the Engineer an account giving detailed particulars of the amount claimed and the grounds upon which the claim is based. Where the event giving rise to the claim has a continuing effect, such account shall be considered to be an interim account and the Contractor shall, at such intervals as the Engineer may reasonably require, send further interim accounts giving the accumulated amount of the claim and any further grounds upon which it is based. In cases where interim accounts are sent to the Engineer, the Contractor shall send a final account within 28 days of the end of the effects resulting from the event. The Contractor shall, if required by the Engineer so to do, copy to the Employer all accounts sent to the Engineer pursuant to this Sub-Clause.

Failure to Comply **53.4** If the Contractor fails to comply with any of the provisions of this Clause in respect of any claim which he seeks to make, his entitlement to payment in respect thereof shall not exceed such amount as the Engineer or any arbitrator or arbitrators appointed pursuant to Sub-Clause 67.3 assessing the claim considers to be verified by contemporary records (whether or not such records were brought to the Engineer's notice as required under Sub-Clauses 53.2 and 53.3).

Payment of Claims **53.5** The Contractor shall be entitled to have included in any interim payment certified by the Engineer pursuant to Clause 60 such amount in respect of any claim as the Engineer, after due consultation with the Employer and the Contractor, may consider due to the Contractor provided that the Contractor has supplied sufficient particulars to enable the Engineer to determine the amount due. If such particulars are insufficient to substantiate the whole of the claim, the Contractor shall be entitled to payment in respect of such part of the claim as such particulars may substantiate to the satisfaction of the Engineer. The Engineer shall notify the Contractor of any determination made under this Sub-Clause, with a copy to the Employer.

Contractor's Equipment, Temporary Works and Materials

Contractor's Equipment, Temporary Works and Materials; Exclusive Use for the Works **54.1** All Contractor's Equipment, Temporary Works and materials provided by the Contractor shall, when brought on to the Site, be deemed to be exclusively intended for the execution of the Works and the Contractor shall not remove the same or any part thereof, except for the purpose of moving it from one part of the Site to another, without the consent of the Engineer. Provided that consent shall not be required for vehicles engaged in transporting any staff, labour, Contractor's Equipment, Temporary Works, Plant or materials to or from the Site.

Employer not Liable for Damage **54.2** The Employer shall not at any time be liable, save as mentioned in Clauses 20 and 65, for the loss of or damage to any of the said Contractor's Equipment, Temporary Works or materials.

Customs Clearance **54.3** The Employer will use his best endeavours in assisting the Contractor, where required, in obtaining clearance through the Customs of Contractor's Equipment, materials and other things required for the Works.

Re-export of Contractor's Equipment **54.4** In respect of any Contractor's Equipment which the Contractor has imported for the purposes of the Works, the Employer will use his best endeavours to assist the Contractor, where required, in procuring any necessary Government consent to the re-export of such Contractor's Equipment by the Contractor upon the removal thereof pursuant to the terms of the Contract.

Conditions of Hire of Contractor's Equipment **54.5** With a view to securing, in the event of termination under Clause 63, the continued availability, for the purpose of executing the Works, of any hired Contractor's Equipment, the Contractor shall not bring on to the Site any hired Contractor's Equipment unless there is an agreement for the hire thereof (which agreement shall be deemed not to include an agreement for hire purchase) which contains a provision that the owner thereof will, on request in writing made by the Employer within 7 days after the date on which any termination has become effective, and on the Employer undertaking to pay all hire charges in respect thereof from such date, hire such Contractor's Equipment to the Employer on the same terms in all respects as the same was hired to the Contractor save that the Employer shall be entitled to permit the use thereof by any other contractor employed by him for the purpose of executing and completing the Works and remedying any defects therein, under the terms of the said Clause 63.

Costs for the Purpose of Clause 63 **54.6** In the event of the Employer entering into any agreement for the hire of Contractor's Equipment pursuant to Sub-Clause 54.5, all sums properly paid by the Employer under the provisions of any such agreement and all costs incurred by him (including stamp duties) in entering into such agreement shall be deemed, for the purpose of Clause 63, to be part of the cost of executing and completing the Works and the remedying of any defects therein.

Incorporation of Clause in Subcontracts **54.7** The Contractor shall, where entering into any subcontract for the execution of any part of the Works, incorporate in such subcontract (by reference or otherwise) the provisions of this Clause in relation to Contractor's Equipment, Temporary Works or materials brought on to the Site by the Subcontractor.

Approval of Materials not Implied **54.8** The operation of this Clause shall not be deemed to imply any approval by the Engineer of the materials or other matters referred to therein nor shall it prevent the rejection of any such materials at any time by the Engineer.

Measurement

Quantities **55.1** The quantities set out in the Bill of Quantities are the estimated quantities for the Works, and they are not to be taken as the actual and correct quantities of the Works to be executed by the Contractor in fulfilment of his obligations under the Contract.

Works to be Measured **56.1** The Engineer shall, except as otherwise stated, ascertain and determine by measurement the value of the Works in accordance with the Contract and the Contractor shall be paid that value in accordance with Clause 60. The Engineer shall, when he requires any part of the Works to be measured, give reasonable notice to the Contractor's authorised agent, who shall:

(a) forthwith attend or send a qualified representative to assist the Engineer in making such measurement, and

(b) supply all particulars required by the Engineer.

Should the Contractor not attend, or neglect or omit to send such representative, then the measurement made by the Engineer or approved by him shall be taken to be the correct measurement of such part of the Works. For the purpose of measuring such Permanent Works as are to be measured by records and drawings, the Engineer shall prepare records and drawings as the work proceeds and the Contractor, as and when called upon to do so in writing, shall, within 14 days, attend to examine and agree such records and drawings with the Engineer 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 14 days of such examination, lodges with the Engineer notice of the respects in which such records and drawings are claimed by him to be incorrect. On receipt of such notice, the Engineer shall review the records and drawings and either confirm or vary them.

Method of Measurement **57.1** The Works shall be measured net, notwithstanding any general or local custom, except where otherwise provided for in the Contract.

Breakdown of Lump Sum Items **57.2** For the purposes of statements submitted in accordance with Sub-Clause 60.1, the Contractor shall submit to the Engineer, within 28 days after the receipt of the Letter of Acceptance, a breakdown for each of the lump sum items contained in the Tender. Such breakdowns shall be subject to the approval of the Engineer.

Provisional Sums

Definition of "Provisional Sum" **58.1** "Provisional Sum" means a sum included in the Contract and so designated in the Bill of Quantities for the execution of any part of the Works or for the supply of goods, materials, Plant or services, or for contingencies, which sum may be used, in whole or in part, or not at all, on the instructions of the Engineer. The Contractor shall be entitled to only such amounts in respect of the work, supply or contingencies to which such Provisional Sums relate as the Engineer shall determine in accordance with this Clause. The Engineer shall notify the Contractor of any determination made under this Sub-Clause, with a copy to the Employer.

Use of Provisional Sums **58.2** In respect of every Provisional Sum the Engineer shall have authority to issue instructions for the execution of work or for the supply of goods, materials, Plant or services by:

(a) the Contractor, in which case the Contractor shall be entitled to an amount equal to the value thereof determined in accordance with Clause 52, and

(b) a nominated Subcontractor, as hereinafter defined, in which case the sum to be paid to the Contractor therefor shall be determined and paid in accordance with Sub-Clause 59.4.

Production of Vouchers **58.3** The Contractor shall produce to the Engineer all quotations, invoices, vouchers and accounts or receipts in connection with expenditure in respect of Provisional Sums, except where work is valued in accordance with rates or prices set out in the Tender.

Nominated Subcontractors

Definition of "Nominated Subcontractors" **59.1** All specialists, merchants, tradesmen and others executing any work or supplying any goods, materials, Plant or services for which Provisional Sums are included in the Contract, who may have been or be nominated or selected or approved by the Employer or the Engineer, and all persons to whom by virtue of the provisions of the Contract the Contractor is required to subcontract shall, in the execution of such work or the supply of such goods, materials, Plant or services, be deemed to be subcontractors to the Contractor and are referred to in this Contract as "nominated Subcontractors".

Nominated Subcontractors; Objection to Nomination **59.2** The Contractor shall not be required by the Employer or the Engineer, or be deemed to be under any obligation, to employ any nominated Subcontractor against whom the Contractor may raise reasonable objection, or who declines to enter into a subcontract with the Contractor containing provisions:

(a) that in respect of the work, goods, materials, Plant or services the subject of the subcontract, the nominated Subcontractor will undertake towards the Contractor such obligations and liabilities as will enable the Contractor to discharge his own obligations and liabilities towards the Employer under the terms of the Contract and will save harmless and indemnify the Contractor from and against the same and from all claims, proceedings, damages, costs, charges and expenses whatsoever arising out of or in connection therewith, or arising out of or in connection with any failure to perform such obligations or to fulfil such liabilities, and

(b) that the nominated Subcontractor will save harmless and indemnify the Contractor from and against any negligence by the nominated Subcontractor, his agents, workmen and servants and from and against any misuse by him or them of any Temporary Works provided by the Contractor for the purposes of the Contract and from all claims as aforesaid.

Design Requirements to be Expressly Stated

59.3 If in connection with any Provisional Sum the services to be provided include any matter of design or specification of any part of the Permanent Works or of any Plant to be incorporated therein, such requirement shall be expressly stated in the Contract and shall be included in any nominated Subcontract. The nominated Subcontract shall specify that the nominated Subcontractor providing such services will save harmless and indemnify the Contractor from and against the same and from all claims, proceedings, damages, costs, charges and expenses whatsoever arising out of or in connection with any failure to perform such obligations or to fulfil such liabilities.

Payments to Nominated Subcontractors

59.4 For all work executed or goods, materials, Plant or services supplied by any nominated Subcontractor, the Contractor shall be entitled to:

(a) the actual price paid or due to be paid by the Contractor, on the instructions of the Engineer, and in accordance with the subcontract;

(b) in respect of labour supplied by the Contractor, the sum, if any, entered in the Bill of Quantities or, if instructed by the Engineer pursuant to paragraph (a) of Sub-Clause 58.2, as may be determined in accordance with Clause 52; and

(c) in respect of all other charges and profit, a sum being a percentage rate of the actual price paid or due to be paid calculated, where provision has been made in the Bill of Quantities for a rate to be set against the relevant Provisional Sum, at the rate inserted by the Contractor against that item or, where no such provision has been made, at the rate inserted by the Contractor in the Appendix to Tender and repeated where provision for such is made in a special item provided in the Bill of Quantities for such purpose.

Certification of Payments to Nominated Subcontractors

59.5 Before issuing, under Clause 60, any certificate, which includes any payment in respect of work done or goods, materials, Plant or services supplied by any nominated Subcontractor, the Engineer shall be entitled to demand from the Contractor reasonable proof that all payments, less retentions, included in previous certificates in respect of the work or goods, materials, Plant or services of such nominated Subcontractor have been paid or discharged by the Contractor. If the Contractor fails to supply such proof then, unless the Contractor:

(a) satisfies the Engineer in writing that he has reasonable cause for withholding or refusing to make such payments, and

(b) produces to the Engineer reasonable proof that he has so informed such nominated Subcontractor in writing,

the Employer shall be entitled to pay to such nominated Subcontractor direct, upon the certificate of the Engineer, all payments, less retentions, provided for in the nominated Subcontract, which the Contractor has failed to make to such nominated Subcontractor and to deduct by way of set-off the amount so paid by the Employer from any sums due or to become due from the Employer to the Contractor.

Provided that, where the Engineer has certified and the Employer has paid direct as aforesaid, the Engineer shall, in issuing any further certificate in favour of the Contractor, deduct from the amount thereof the amount so paid, direct as aforesaid, but shall not withhold or delay the issue of the certificate itself when due to be issued under the terms of the Contract.

Certificates and Payment

Monthly Statements **60.1** The Contractor shall submit to the Engineer after the end of each month six copies, each signed by the Contractor's representative approved by the Engineer in accordance with Sub-Clause 15.1, of a statement, in such form as the Engineer may from time to time prescribe, showing the amounts to which the Contractor considers himself to be entitled up to the end of the month in respect of:

(a) the value of the Permanent Works executed,

(b) any other items in the Bill of Quantities including those for Contractor's Equipment, Temporary Works, dayworks and the like,

(c) the percentage of the invoice value of listed materials, all as stated in the Appendix to Tender, and Plant delivered by the Contractor on the Site for incorporation in the Permanent Works but not incorporated in such Works,

(d) adjustments under Clause 70, and

(e) any other sum to which the Contractor may be entitled under the Contract or otherwise.

Monthly Payments **60.2** The Engineer shall, within 28 days of receiving such statement, deliver to the Employer an Interim Payment Certificate stating the amount of payment to the Contractor which the Engineer considers due and payable in respect of such statement, subject:

(a) firstly, to the retention of the amount calculated by applying the Percentage of Retention stated in the Appendix to Tender, to the amount to which the Contractor is entitled under paragraphs (a), (b), (c) and (e) of Sub-Clause 60.1 until the amount so retained reaches the Limit of Retention Money stated in the Appendix to Tender, and

(b) secondly, to the deduction, other than pursuant to Clause 47, of any sums which may have become due and payable by the Contractor to the Employer.

Provided that the Engineer shall not be bound to certify any payment under this Sub-Clause if the net amount thereof, after all retentions and deductions, would be less than the Minimum Amount of Interim Payment Certificates stated in the Appendix to Tender.

Notwithstanding the terms of this Clause or any other Clause of the Contract no amount will be certified by the Engineer for payment until the performance security, if required under the Contract, has been provided by the Contractor and approved by the Employer.

Payment of Retention Money **60.3** (a) Upon the issue of the Taking-Over Certificate with respect to the whole of the Works, one half of the Retention Money, or upon the issue of a Taking-Over Certificate with respect to a Section or part of the Permanent Works only such proportion thereof as the Engineer determines having regard to the relative value of such Section or part of the Permanent Works, shall be certified by the Engineer for payment to the Contractor.

(b) Upon the expiration of the Defects Liability Period for the Works the other half of the Retention Money shall be certified by the Engineer for payment to the Contractor. Provided that, in the event of different Defects Liability Periods having become applicable to different Sections or parts of the Permanent Works pursuant to Clause 48, the expression "expiration of the Defects Liability Period" shall, for the purposes of this Sub-Clause, be deemed to mean the expiration of the latest of such periods. Provided also that if at such time there shall remain to be executed by the Contractor any work instructed, pursuant to Clauses 49 and 50, in respect of the Works, the Engineer shall be entitled to withhold certification until completion of such work of so much of the balance of the Retention Money as shall, in the opinion of the Engineer, represent the cost of the work remaining to be executed.

Correction of Certificates **60.4** The Engineer may by any Interim Payment Certificate make any correction or modification in any previous Interim Payment Certificate which shall have been issued by him and shall have authority, if any work is not being carried out to his satisfaction, to omit or reduce the value of such work in any Interim Payment Certificate.

Statement at Completion **60.5** Not later than 84 days after the issue of the Taking-Over Certificate in respect of the whole of the Works, the Contractor shall submit to the Engineer six copies of a Statement at Completion with supporting documents showing in detail, in the form approved by the Engineer:

(a) the final value of all work done in accordance with the Contract up to the date stated in such Taking-Over Certificate,

(b) any further sums which the Contractor considers to be due, and

(c) an estimate of amounts which the Contractor considers will become due to him under the Contract.

The estimated amounts shall be shown separately in such Statement at Completion. The Engineer shall certify payment in accordance with Sub-Clause 60.2.

Final Statement **60.6** Not later than 56 days after the issue of the Defects Liability Certificate pursuant to Sub-Clause 62.1, the Contractor shall submit to the Engineer for consideration six copies of a draft final statement with supporting documents showing in detail, in the form approved by the Engineer:

(a) the value of all work done in accordance with the Contract, and

(b) any further sums which the Contractor considers to be due to him under the Contract or otherwise.

If the Engineer disagrees with or cannot verify any part of the draft final statement, the Contractor shall submit such further information as the Engineer may reasonably require and shall make such changes in the draft as may be agreed between them. The Contractor shall then prepare and submit to the Engineer the final statement as agreed (for the purposes of these Conditions referred to as the "Final Statement").

If, following discussions between the Engineer and the Contractor and any changes to the draft final statement which may be agreed between them, it becomes evident that a dispute exists, the Engineer shall deliver to the Employer an Interim Payment Certificate for those parts of the draft final statement, if any, which are not in dispute. The dispute may then be settled in accordance with Clause 67.

Discharge **60.7** Upon submission of the Final Statement, the Contractor shall give to the Employer, with a copy to the Engineer, a written discharge confirming that the total of the Final Statement represents full and final settlement of all monies due to the Contractor arising out of or in respect of the Contract. Provided that such discharge shall become effective only after payment due under the Final Payment Certificate issued pursuant to Sub-Clause 60.8 has been made and the performance security referred to in Sub-Clause 10.1, if any, has been returned to the Contractor.

Final Payment Certificate **60.8** Within 28 days after receipt of the Final Statement, and the written discharge, the Engineer shall issue to the Employer (with a copy to the Contractor) a Final Payment Certificate stating:

(a) the amount which, in the opinion of the Engineer, is finally due under the Contract or otherwise, and

(b) after giving credit to the Employer for all amounts previously paid by the Employer and for all sums to which the Employer is entitled other than under Clause 47, the balance, if any, due from the Employer to the Contractor or from the Contractor to the Employer as the case may be.

Cessation of Employer's Liability **60.9** The Employer shall not be liable to the Contractor for any matter or thing arising out of or in connection with the Contract or execution of the Works, unless the Contractor shall have included a claim in respect thereof in his Final Statement and (except in respect of matters or things arising after the issue of the Taking-Over Certificate in respect of the whole of the Works) in the Statement at Completion referred to in Sub-Clause 60.5.

Time for Payment **60.10** The amount due to the Contractor under any Interim Payment Certificate issued by the Engineer pursuant to this Clause, or to any other term of the Contract, shall, subject to Clause 47, be paid by the Employer to the Contractor within 28 days after such Interim Payment Certificate has been delivered to the Employer, or, in the case of the Final Payment Certificate referred to in Sub-Clause 60.8, within 56 days, after such Final Payment Certificate has been delivered to the Employer. In the event of the failure of the Employer to make payment within the times stated, the Employer shall pay to the Contractor interest at the rate stated in the Appendix to Tender upon all sums unpaid from the date by which the same should have been paid. The provisions of this Sub-Clause are without prejudice to the Contractor's entitlement under Clause 69 or otherwise.

Approval only by Defects Liability Certificate **61.1** Only the Defects Liability Certificate, referred to in Clause 62, shall be deemed to constitute approval of the Works.

Defects Liability Certificate **62.1** The Contract shall not be considered as completed until a Defects Liability Certificate shall have been signed by the Engineer and delivered to the Employer, with a copy to the Contractor, stating the date on which the Contractor shall have completed his obligations to execute and complete the Works and remedy any defects therein to the Engineer's satisfaction. The Defects Liability Certificate shall be given by the Engineer within 28 days after the expiration of the Defects Liability Period, or, if different defects liability periods shall become applicable to different Sections or parts of the Permanent Works, the expiration of the latest such period, or as soon thereafter as any works instructed, pursuant to Clauses 49 and 50, have been completed to the satisfaction of the Engineer. Provided that the issue of the Defects Liability Certificate shall not be a condition precedent to payment to the Contractor of the second portion of the Retention Money in accordance with the conditions set out in Sub-Clause 60.3.

Unfulfilled Obligations **62.2** Notwithstanding the issue of the Defects Liability Certificate the Contractor and the Employer shall remain liable for the fulfilment of any obligation incurred under the provisions of the Contract prior to the issue of the Defects Liability Certificate which remains unperformed at the time such Defects Liability Certificate is issued and, for the purposes of determining the nature and extent of any such obligation, the Contract shall be deemed to remain in force between the parties to the Contract.

Remedies

Default of Contractor **63.1** If the Contractor is deemed by law unable to pay his debts as they fall due, or enters into voluntary or involuntary bankruptcy, liquidation or dissolution (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), or becomes insolvent, or makes an arrangement with, or assignment in favour of, his creditors, or agrees to carry out the Contract under a committee of inspection of his creditors, or if a receiver, administrator, trustee or liquidator is appointed over any substantial part of his assets, or if, under any law or regulation relating to reorganization, arrangement or readjustment of debts, proceedings are commenced against the Contractor or resolutions passed in connection with dissolution or liquidation or if any steps are taken to enforce any security interest over a substantial part of the assets of the Contractor, or if any act is done or event occurs with respect to the Contractor or his assets which, under any applicable law has a substantially similar effect to any of the foregoing acts or events, or if the Contractor has contravened Sub-Clause 3.1, or has an execution levied on his goods, or if the Engineer certifies to the Employer, with a copy to the Contractor, that, in his opinion, the Contractor:

(a) has repudiated the Contract,

(b) without reasonable excuse has failed

(i) to commence the Works in accordance with Sub-Clause 41.1, or

(ii) to proceed with the Works, or any Section thereof, within 28 days after receiving notice pursuant to Sub-Clause 46.1,

(c) has failed to comply with a notice issued pursuant to Sub-Clause 37.4 or an instruction issued pursuant to Sub-Clause 39.1 within 28 days after having received it,

(d) despite previous warning from the Engineer, in writing, is otherwise persistently or flagrantly neglecting to comply with any of his obligations under the Contract, or

(e) has contravened Sub-Clause 4.1,

then the Employer may, after giving 14 days' notice to the Contractor, enter upon the Site and the Works and terminate the employment of the Contractor without thereby releasing the Contractor from any of his obligations or liabilities under the Contract, or affecting the rights and authorities conferred on the Employer or the Engineer by the Contract, and may himself complete the Works or may employ any other contractor to complete the Works. The Employer or such other contractor may use for such completion so much of the Contractor's Equipment, Temporary Works and materials as he or they may think proper.

Valuation at Date of Termination **63.2** The Engineer shall, as soon as may be practicable after any such entry and termination by the Employer, fix and determine ex parte, or by or after reference to the parties or after such investigation or enquiries as he may think fit to make or institute, and shall certify:

a) what amount (if any) had, at the time of such entry and termination, been reasonably earned by or would reasonably accrue to the Contractor in respect of work then actually done by him under the Contract, and

(b) the value of any of the said unused or partially used materials, any Contractor's Equipment and any Temporary Works.

Payment after Termination **63.3** If the Employer terminates the Contractor's employment under this Clause, he shall not be liable to pay to the Contractor any further amount (including damages) in respect of the Contract until the expiration of the Defects Liability Period and there after until the costs of execution, completion and remedying of any defects, damages for delay in completion (if any) and all other expenses incurred by the Employer have been ascertained and the amount thereof certified by the Engineer. The Contractor shall then be entitled to receive only such sum (if any) as the Engineer may certify would have been payable to him upon due completion by him after deducting the said amount. If such amount exceeds the sum which would have been payable to the Contractor on due completion by him, then the Contractor shall, upon demand, pay to the Employer the amount of such excess and it shall be deemed a debt due by the Contractor to the Employer and shall be recoverable accordingly.

Assignment of Benefit of Agreement **63.4** Unless prohibited by law, the Contractor shall, if so instructed by the Engineer within 14 days of such entry and termination referred to in Sub-Clause 63.1, assign to the Employer the benefit of any agreement for the supply of any goods or materials or services and/or for the execution of any work for the purposes of the Contract, which the Contractor may have entered into.

Urgent Remedial Work **64.1** If, by reason of any accident, or failure, or other event occurring to, in, or in connection with the Works, or any part thereof, either during the execution of the Works, or during the Defects Liability Period, any remedial or other work is, in the opinion of the Engineer, urgently necessary for the safety of the Works and the Contractor is unable or unwilling at once to do such work, the Employer shall be entitled to employ and pay other persons to carry out such work as the Engineer may consider necessary. If the work or repair so done by the Employer is work which, in the opinion of the Engineer, the Contractor was liable to do at his own cost under the Contract, then all costs consequent thereon or incidental thereto shall, after due consultation with the Employer and the Contractor, be determined by the Engineer and shall be recoverable from the Contractor by the Employer, and may be deducted by the Employer from any monies due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly, with a copy to the Employer. Provided that the Engineer shall, as soon after the occurrence of any such emergency as may be reasonably practicable, notify the Contractor thereof.

Special Risks

No Liability for Special Risks **65.1** The Contractor shall be under no liability whatsoever in consequence of any of the special risks referred to in Sub-Clause 65.2, whether by way of indemnity or otherwise, for or in respect of:

(a) destruction of or damage to the Works, save to work condemned under the provisions of Clause 39 prior to the occurrence of any of the said special risks,

(b) destruction of or damage to property, whether of the Employer or third parties, or

(c) injury or loss of life.

Special Risks **65.2** The special risks are:

(a) the risks defined under paragraphs (a), (c), (d) and (e) of Sub-Clause 20.4, and

(b) the risks defined under paragraph (b) of Sub-Clause 20.4 insofar as these relate to the country in which the Works are to be executed.

Damage to Works by Special Risks **65.3** If the Works or any materials or Plant on or near or in transit to the Site, or any of the Contractor's Equipment, sustain destruction or damage by reason of any of the said special risks, the Contractor shall be entitled to payment in accordance with the Contract for any Permanent Works duly executed and for any materials or Plant so destroyed or damaged and, so far as may be required by the Engineer or as may be necessary for the completion of the Works, to payment for:

(a) rectifying any such destruction or damage to the Works, and

(b) replacing or rectifying such materials or Contractor's Equipment,

and the Engineer shall determine an addition to the Contract Price in accordance with Clause 52 (which shall in the case of the cost of replacement of Contractor's Equipment include the fair market value thereof as determined by the Engineer) and shall notify the Contractor accordingly, with a copy to the Employer.

Projectile, Missile **65.4** Destruction, damage, injury or loss of life caused by the explosion or impact, whenever and wherever occurring, of any mine, bomb, shell, grenade, or other projectile, missile, munition, or explosive of war, shall be deemed to be a consequence of the said special risks.

Increased Costs arising from Special Risks **65.5** Save to the extent that the Contractor is entitled to payment under any other provision of the Contract, the Employer shall repay to the Contractor any costs of the execution of the Works (other than such as may be attributable to the cost of reconstructing work condemned under the provisions of Clause 39 prior to the occurrence of any special risk) which are howsoever attributable to or consequent on or the result of or in any way whatsoever connected with the said special risks, subject however to the provisions in this Clause hereinafter contained in regard to outbreak of war, but the Contractor shall, as soon as any such cost comes to his knowledge, forthwith notify the Engineer thereof. The Engineer shall, after due consultation with the Employer and the Contractor, determine the amount of the Contractor's costs in respect thereof which shall be added to the Contract Price and shall notify the Contractor accordingly, with a copy to the Employer.

Outbreak of War **65.6** If, during the currency of the Contract, there is an outbreak of war, whether war is declared or not, in any part of the world which, whether financially or otherwise, materially affects the execution of the Works, the Contractor shall, unless and until the Contract is terminated under the provisions of this Clause, continue to use his best endeavours to complete the execution of the Works. Provided that the Employer shall be entitled, at any time after such outbreak of war, to terminate the Contract by giving notice to the Contractor and, upon such notice being given, the Contract shall, except as to the rights of the parties under this Clause and Clause 67, terminate, but without prejudice to the rights of either party in respect of any antecedent breach thereof.

Removal of Contractor's Equipment on Termination

65.7 If the Contract is terminated under the provisions of Sub-Clause 65.6, the Contractor shall, with all reasonable dispatch, remove from the Site all Contractor's Equipment and shall give similar facilities to his Subcontractors to do so.

Payment if Contract Terminated

65.8 If the Contract is terminated as aforesaid, the Contractor shall be paid by the Employer, insofar as such amounts or items have not already been covered by payments on account made to the Contractor, for all work executed prior to the date of termination at the rates and prices provided in the Contract and in addition:

(a) the amounts payable in respect of any preliminary items referred to in the Bill of Quantities, so far as the work or service comprised therein has been carried out or performed, and a proper proportion of any such items which have been partially carried out or performed;

(b) the cost of materials, Plant or goods reasonably ordered for the Works which have been delivered to the Contractor or of which the Contractor is legally liable to accept delivery, such materials, Plant or goods becoming the property of the Employer upon such payments being made by him;

(c) a sum being the amount of any expenditure reasonably incurred by the Contractor in the expectation of completing the whole of the Works insofar as such expenditure has not been covered by any other payments referred to in this Sub-Clause;

(d) any additional sum payable under the provisions of Sub-Clauses 65.3 and 65.5;

(e) such proportion of the cost as may be reasonable, taking into account payments made or to be made for work executed, of removal of Contractor's Equipment under Sub-Clause 65.7 and, if required by the Contractor, return thereof to the Contractor's main plant yard in his country of registration or to other destination, at no greater cost; and

(f) the reasonable cost of repatriation of all the Contractor's staff and workmen employed on or in connection with the Works at the time of such termination.

Provided that against any payment due from the Employer under this Sub-Clause, the Employer shall be entitled to be credited with any outstanding balances due from the Contractor for advances in respect of Contractor's Equipment, materials and Plant and any other sums which, at the date of termination, were recoverable by the Employer from the Contractor under the terms of the Contract. Any sums payable under this Sub-Clause shall, after due consultation with the Employer and the Contractor, be determined by the Engineer who shall notify the Contractor accordingly, with a copy to the Employer.

Release from Performance

Payment in Event of Release from Performance

66.1 If any circumstance outside the control of both parties arises after the issue of the Letter of Acceptance which renders it impossible or unlawful for either or both parties to fulfil his or their contractual obligations, or under the law governing the Contract the parties are released from further performance, then the parties shall be discharged from the Contract, except as to their rights under this Clause and Clause 67 and without prejudice to the rights of either party in respect of any antecedent breach of the Contract, and the sum payable by the Employer to the Contractor in respect of the work executed shall be the same as that which would have been payable under Clause 65 if the Contract had been terminated under the provisions of Clause 65.

Settlement of Disputes

Engineer's Decision **67.1** 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 Engineer, the matter in dispute shall, in the first place, be referred in writing to the Engineer, with a copy to the other party. Such reference shall state that it is made pursuant to this Clause. No later than the eighty-fourth day after the day on which he received such reference the 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.

Unless the Contract has already been repudiated or terminated, the Contractor shall, in every case, continue to proceed with the Works with all due diligence and the Contractor and the Employer shall give effect forthwith to every such decision of the Engineer unless and until the same shall be revised, as hereinafter provided, in an amicable settlement or an arbitral award.

If either the Employer or the Contractor be dissatisfied with any decision of the Engineer, or if the Engineer fails to give notice of his decision on or before the eighty-fourth day after the day on which he received the reference, then either the Employer or the Contractor may, on or before the seventieth day after the day on which he received notice of such decision, or on or before the seventieth day after the day on which the said period of 84 days expired, as the case may be, give notice to the other party, with a copy for information to the Engineer, of his intention 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 67.4, no arbitration in respect thereof may be commenced unless such notice is given.

If the Engineer has given notice of his decision as to a matter in dispute to the Employer and the Contractor and no notice of intention to commence arbitration as to such dispute has been given by either the Employer or the Contractor on or before the seventieth day after the day on which the parties received notice as to such decision from the Engineer, the said decision shall become final and binding upon the Employer and the Contractor.

Amicable Settlement **67.2** Where notice of intention to commence arbitration as to a dispute has been given in accordance with Sub-Clause 67.1, the parties shall attempt to settle such dispute amicably before the commencement of arbitration. Provided that, unless the parties otherwise agree, arbitration may be commenced on or after the fifty-sixth day after the day on which notice of intention to commence arbitration of such dispute was given, even if no attempt at amicable settlement thereof has been made.

Arbitration **67.3** Any dispute in respect of which:

(a) the decision, if any, of the Engineer has not become final and binding pursuant to Sub-Clause 67.1, and

(b) amicable settlement has not been reached within the period stated in Sub-Clause 67.2,

shall be finally settled, unless otherwise specified in the Contract, under the Rules of Conciliation and Arbitration of the International Chamber of Commerce by one or more arbitrators appointed under such Rules. The said arbitrator/s shall have full power to open up, review and revise any decision, opinion, instruction, determination, certificate or valuation of the Engineer related to the dispute.

Neither party shall be limited in the proceedings before such arbitrator/s to the evidence or arguments put before the Engineer for the purpose of obtaining his said decision pursuant to Sub-Clause 67.1. No such decision shall disqualify the Engineer from being called as a witness and giving evidence before the arbitrator/s on any matter whatsoever relevant to the dispute.

Arbitration may be commenced prior to or after completion of the Works, provided that the obligations of the Employer, the Engineer and the Contractor shall not be altered by reason of the arbitration being conducted during the progress of the Works.

Failure to Comply with Engineer's Decision **67.4** 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 67.1 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 67.3. The provisions of Sub-Clauses 67.1 and 67.2 shall not apply to any such reference.

Notices

Notice to Contractor **68.1** All certificates, notices or instructions to be given to the Contractor by the Employer or the Engineer under the terms of the Contract shall be sent by 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.

Notice to Employer and Engineer **68.2** Any notice to be given to the Employer or to the Engineer under the terms of the Contract shall be sent by post, cable, telex or facsimile transmission to or left at the respective addresses nominated for that purpose in Part II of these Conditions.

Change of Address **68.3** Either party may change a nominated address to another address in the country where the Works are being executed by prior notice to the other party, with a copy to the Engineer, and the Engineer may do so by prior notice to both parties.

Default of Employer

Default of Employer **69.1** In the event of the Employer:

(a) failing to pay to the Contractor the amount due under any certificate of the Engineer within 28 days after the expiry of the time stated in Sub-Clause 60.10 within which payment is to be made, subject to any deduction that the Employer is entitled to make under the Contract,

(b) interfering with or obstructing or refusing any required approval to the issue of any such certificate,

(c) becoming bankrupt or, being a company, going into liquidation, other than for the purpose of a scheme of reconstruction or amalgamation, or

(d) giving notice to the Contractor that for unforeseen economic reasons it is impossible for him to continue to meet his contractual obligations,

the Contractor shall be entitled to terminate his employment under the Contract by giving notice to the Employer, with a copy to the Engineer. Such termination shall take effect 14 days after the giving of the notice.

Removal of Contractor's Equipment **69.2** Upon the expiry of the 14 days' notice referred to in Sub-Clause 69.1, the Contractor shall, notwithstanding the provisions of Sub-Clause 54.1, with all reasonable despatch, remove from the Site all Contractor's Equipment brought by him thereon.

Payment on Termination **69.3** In the event of such termination the Employer shall be under the same obligations to the Contractor in regard to payment as if the Contract had been terminated under the provisions of Clause 65, but, in addition to the payments specified in Sub-Clause 65.8, the Employer shall pay to the Contractor the amount of any loss or damage to the Contractor arising out of or in connection with or by consequence of such termination.

Contractor's Entitlement to Suspend Work **69.4** Without prejudice to the Contractor's entitlement to interest under Sub-Clause 60.10 and to terminate under Sub-Clause 69.1, the Contractor may, if the Employer fails to pay the Contractor the amount due under any certificate of the Engineer within 28 days after the expiry of the time stated in Sub-Clause 60.10 within which payment is to be made, subject to any deduction that the Employer is entitled to make under the Contract, after giving 28 days' prior notice to the Employer, with a copy to the Engineer, suspend work or reduce the rate of work.

If the Contractor suspends work or reduces the rate of work in accordance with the provisions of this Sub-Clause and thereby suffers delay or incurs costs the Engineer shall, after due consultation with the Employer and the Contractor, determine:

(a) any extension of time to which the Contractor is entitled under Clause 44, and

(b) the amount of such costs, which shall be added to the Contract Price,

and shall notify the Contractor accordingly, with a copy to the Employer.

Resumption of Work **69.5** Where the Contractor suspends work or reduces the rate of work. having given notice in accordance with Sub-Clause 69.4, and the Employer subsequently pays the amount due, including interest pursuant to Sub-Clause 60.10, the Contractor's entitlement under Sub-Clause 69.1 shall, if notice of termination has not been given, lapse and the Contractor shall resume normal working as soon as is reasonably possible.

Changes in Cost and Legislation

Increase or Decrease of Cost **70.1** There shall be added to or deducted from the Contract Price such sums in respect of rise or fall in the cost of labour and/or materials or any other matters affecting the cost of the execution of the Works as may be determined in accordance with Part II of these Conditions.

Subsequent Legislation **70.2** If, after the date 28 days prior to the latest date for submission of tenders for the Contract there occur in the country in which the Works are being or are to be executed changes to any National or State Statute, Ordinance, Decree or other Law or any regulation or bye-law of any local or other duly constituted authority, or the introduction of any such State Statute, Ordinance, Decree, Law, regulation or bye-law which causes additional or reduced cost to the Contractor, other than under Sub-Clause 70.1, in the execution of the Contract, such additional or reduced cost shall, after due consultation with the Employer and the Contractor, be determined by the Engineer and shall be added to or deducted from the Contract Price- and the Engineer shall notify the Contractor accordingly, with a copy to the Employer.

Currency and Rates of Exchange

Currency Restrictions **71.1** If, after the date 28 days prior to the latest date for submission of tenders for the Contract, the Government or authorised agency of the Government of the country in which the Works are being or are to be executed imposes currency restrictions and/or transfer of currency restrictions in relation to the currency or currencies in which the Contract Price is to be paid, the Employer shall reimburse any loss or damage to the Contractor arising therefrom, without prejudice to the right of the Contractor to exercise any other rights or remedies to which he is entitled in such event.

Rates of Exchange **72.1** Where the Contract provides for payment in whole or in part to be made to the Contractor in foreign currency or currencies, such payment shall not be subject to variations in the rate or rates of exchange between such specified foreign currency or currencies and the currency of the country in which the Works are to be executed.

Currency Proportions

72.2 Where the Employer has required the Tender to be expressed in a single currency but with payment to be made in more than one currency and the Contractor has stated the proportions or amounts of other currency or currencies in which he requires payment to be made, the rate or rates of exchange applicable for calculating the payment of such proportions or amounts shall, unless otherwise stated in Part II of these Conditions, be those prevailing, as determined by the Central Bank of the country in which the Works are to be executed, on the date 28 days prior to the latest date for the submission of tenders for the Contract, as has been notified to the Contractor by the Employer prior to the submission of tenders or as provided for in the Tender.

Currencies of Payment for Provisional Sums

72.3 Where the Contract provides for payment in more than one currency, the proportions or amounts to be paid in foreign currencies in respect of Provisional Sums shall be determined in accordance with the principles set forth in Sub-Clauses 72.1 and 72.2 as and when these sums are utilised in whole or in part in accordance with the provisions of Clauses 58 and 59.

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1. SPECIFICATIONS - TECHNICAL PROVISIONS

1.1 General

(1) Clearing Right-of-Way

Right-of-way clearing shall be restricted to the minimum necessary for the safe construction and operation of the line. Clearing shall generally consist of brushing out the center line, tower locations, and conductor pulling sites within 25 meters on each side of the center line. Trees over 2.5 meters in height that constitute a hazard or danger to the transmission line, or whose tops are within 6 meters at 90℃ final conductor sag position, shall be removed. In addition, tall trees outside the cleared area, of such height that they could fall within 5m of the outermost conductor shall be removed/trimmed.

The clearing of vegetation, bushes, and trees shall be restricted to that required for the placement of footings and the assembly and erection of towers and wire-pulling Sites.

The cleared materials will be the property of the Land Owner/Authorities. The Contractor shall be responsible for compacting and re-leveling the ground to the original surface level and gradient. Where agreed by the Engineer a percentage of the soil may be disposed off by local spreading. Reinstatement of trees to a standard at least equal to the condition of the site before construction shall be made.

The contractor shall immediately establish the Right of Way and clear trees, and any obstructions or hindrances after mobilization, and obtain approval from the local authorities in the execution of work so that there will be no delay in execution/completion of the various activities and work will be completed as per schedule. The contractor shall also bind his labor and staff to use the minimum area during the execution of the work.

(2) Survey and Profiling

The transmission line route marked on SoP sheets is firm and final as established by the Employer and is shown in the specification's drawings. However, the Contractor shall check the line route prior to starting the field ground survey. Plan & profile drawings prepared on PLS-CADD (Version 16.20) are attached with the Bidding Document.

<u>For Diverted Route only:</u>

The Contractor shall be responsible for carrying out a detailed survey using RTK, preparing a plan and profile, tower spotting using PLS-CADD software (Version 16.20), and preparing the as-built construction structure list accordingly. In case

the contractor intends to use the latest version of the software then the same software shall be provided to the Consultant for their review and checking.

The work to be done by the Contractor shall include but not be limited to the following:

(i) Before starting the work, a walkover survey shall be carried out of the line route in light of the plan & profile drawings.

(ii) If any line diversion along the proposed transmission lines routes is necessitated as decided/approved by the Engineer, the Contractor will carry out an investigation of the route along with necessary plan tabling of the area and shall make necessary modifications and establish the terminal points, angle's locations, road crossings and other points of interest as advised by the Engineer or his nominated person.

All the proposed modifications are then to be transferred onto the route map by the Contractor and submitted to the Engineer for approval.

(iii) Contractor shall be responsible for obtaining clearances, permissions, and approvals for the entire line as well as for diverted portions from various statutory bodies/authorities like the Forest Department, Aviation Authorities, National Highway Authority, Pakistan Environmental Agency (KPK & Punjab also), etc. The Employer will provide complete assistance to the Contractor; however, the responsibility lies with the Contractor for submission of the required details, and follow-up with the statutory bodies for obtaining the approval.

(iv) During the survey, the Contractor will ascertain whether the route indicated to him is most desirable. If in his opinion another route would be more desirable on technical grounds or more economical, he shall report his findings to the Engineer who will then decide about the adoption of the new route.

(v) The survey shall be executed using RTK equipment. Ground elevations are to be taken at regular intervals and at locations of change of slope and for various features like roads, rail tracks, river, canals, power & communication lines, water courses etc.

(vi) The Contractor will install the concrete markers of at least 130 x 150 mm at top and bottom with a height not less than 1m. The markers shall be buried 0.5 m below existing ground level. The markers shall be white washed and a red point shall be made on the top of the marker to indicate the exact center of the line.

(vii) Total accumulated error in longitudinal and transverse measurements should not exceed 0.05% and in the vertical direction should not exceed 0.20%.

(viii) Longitudinal profiles and strip plans are to be prepared by the Contractor in the following scales:

Horizontal	1: 2000
Vertical	1: 200

and shall be submitted for Engineer approval. The profile shall be prepared on plans of 700 mm x 2000 mm size, or other size approved by the Engineer. Each sheet shall repeat 1/5 km of the route on either side. Also, the sheet numbers shall be indicated on a key map for reference.

(ix) Profiles shall include all details relevant to the survey of the routes including the position of concrete markers, crossings, transversal slopes, location of forest reserves, population limits, and position of the road.

The ground profile shall be along the route centre line of the approved route. All obstacles and important features within 50 meter on either side shall be shown on the profiles.

Tower spotting shall be carried out by the Contractor using PLS-CADD software for the ACSR “Bunting" conductor taking into account the maximum & minimum temperatures as 90°C & -8°C. The Contractor shall validate and establish the minimum mid-span ground clearance of 10m complying with the Electric and Magnetic field exposure guidelines for 50Hz published by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) referenced at one (01) meter above from ground level.

The tower positions shall be verified for suitability. Templates of various spans will be provided free of cost to the Engineer on PVC sheets with at least 1mm thickness indicating hot, cold, and ground clearance curves.

The construction structure list shall be prepared by the Contractor as approved by the Engineer.

(3) Updating of the provided plan & profile drawings and construction structure list of the proposed transmission line route to prepare as-built drawings.

UTM Coordinates by hand-held GPS (with 3m accuracy) of each tower should be collected and submitted to the Engineer.

(4) **Tower Staking**

Staking (centre and reference pegs) of the tower locations that have to be concreted are included in the contractor’s scope.

Tower centres shall be staked in the field along with two reference stakes/pegs on either side of the tower along the line route, using wooden pegs. All tower locations having angle shall be bisected.

Surveying is not mentioned in these specifications as being the responsibility of the Contractor. This shall include, but not be limited to the location of tower footings.

The footing for the terminal dead-end tower shall be so placed that the transverse axis of the tower cross-arms shall be parallel to the transverse axis of the gantry structures of the substation up to 20^{o} line angle. If the line angle is more than 20^{o} then the terminal dead-end tower location shall be bisected.

(5) **Contouring at hilly / undulated locations**

The up or down level of each footing center with reference to the center of the tower location shall be recorded at intervals of 1 meter up to 20 meters using total stations/digital theodolite and digitized contour plans shall be made. Based on the digitized elevation plans unequal leg extensions shall be decided for particular tower locations and approved by the Engineer.

1.2 Confirmatory Sub Soil Investigation

The Work specified herein is to determine the type and geotechnical characteristics of the foundation strata to the specified depth and location. This is to be accomplished through wash boring or rotary (including rock coring) drilling or percussion, field testing, groundwater observations, soil sampling, and laboratory testing. The location along with the depth of investigation boreholes on the ground shall be established by the Contractor following the Drawings and from reference points to be approved by the Engineer as per requirement. The Contractor shall have at the site, at all times only a qualified experienced geologist/engineer who will conduct and supervise drilling/logging activities. Hand-held GPS should be available at the investigation site for verification of borehole/test pit location by the Engineer.

(a) **Method of Drilling**

Drilling shall be done by rotary (including rock coring) or wash boring, percussion method or the combination of two methods by means of which a hole of specified diameter is extended in depths. Use of bottom discharge drilling bit shall not be permitted. The contractor shall be allowed to use the percussion method where gravels & boulders are encountered.

(b) **Drilling of boreholes in flowing water conditions**

Drilling may be carried out underwater conditions. During the investigation, the Engineer may change such locations to land drilling depending on the prevailing waterway conditions.

(c) **Test Pit**

The test pits shall be excavated at the locations as approved by the Engineer. Excavations of test pits shall be made to the depths as directed by the Engineer by manual labour and with the help of suitable digging tools. Test pits shall generally be excavated to a depth of about 3 meters below the ground surface or bedrock whichever is encountered earlier. An undisturbed block (30cmX30cmX30cm) sample shall be extracted from each test pit. After field testing and sampling, the test pit should be backfilled as instructed by the Engineer.

(d) **Drilling Fluid**

The drilling fluid used for rotary drilling or wash boring or percussion shall be clean water clear from suspended sediments. The Contractor may use the natural or commercial drilling mud/bentonite slurry as drilling fluid.

(e) **Casing of Boreholes.**

(i) Casing of a required size allowing entry of sampling tools shall be used in conjunction with drilling to wall the boring to the bottom of the hole.

(ii) The casing shall be made of cylindrical steel pipes and shall have sufficient strength so as to maintain position and shape during drilling operations.

(iii) The casing may be omitted only where it can be shown to the satisfaction of the Engineer that sampling operations without the casing will not entrain soils from an elevation higher than the depth at which field testing or sampling is to be made.

(iv) It shall be the Contractor's responsibility to pull out casing from the boreholes after its completion for which no extra payment shall be made.

(f) **Field Testing**

Field testing shall include Standard Penetration Test. Standard Penetration Test shall conform to ASTM D-1586. This designation describes a procedure to obtain a record of the resistance of subsoil to the penetration of a standard sampler and to obtain representative disturbed samples of the material for identification purposes and laboratory testing. The penetration resistance shall be expressed as the number of blows of a 63.4 kg (140 lbs.) hammer freely dropping 762 mm (30 inches) required to force the standard sampler 305 mm (12 inches) into the soil. Standard Penetration Tests shall be conducted in the boreholes at a 1-meter interval from 1-meter depth to the bottom of the borehole unless otherwise directed by the Engineer. Immediately after each penetration test a representative portion of the soil core shall be placed in a moisture-proof container.

(g) **Undisturbed Sampling**

The undisturbed samples shall be taken in cohesive and non-cohesive materials. Samples shall be obtained using Denison or Pitcher sampler or equivalent double tube core barrel or Shelby tube. The sampling procedure shall conform to the latest B.S./ASTM Standards. The length of undisturbed samples obtained shall not be less than 30 cm. Immediately upon extraction from the hole, the sample shall be properly waxed. The number and depth of undisturbed samples from each hole shall be as directed by the Engineer during the progress of the drilling work at the site.

(h) **Labeling and Disposition of Samples**

Each sample including cores shall have identification tags giving information regarding Sample No., Top Elevation of Hole, Date of Sampling, Depth, and Length of Sample, and Description of Sample.

The selected undisturbed and disturbed samples shall be carefully transported for testing by the Contractor to the approved testing laboratory. Every precaution shall be taken to avoid damage to samples as a result of careless handling and undue delay in transportation. The tubes containing undisturbed samples & rock cores shall be well-packed in wooden boxes to protect the samples against vibration.

(i) **Ground Water Observations**

Whenever required by the Engineer, boreholes shall be preserved for observations of groundwater conditions. When the borings are advanced by using natural or commercial drilling mud/bentonite to stabilize the hole, the hole shall be flushed thoroughly with clean water at the completion of the boring for the purpose of observing groundwater levels. After field testing and sampling, the borehole should be backfilled as instructed by the Engineer

(j) **Laboratory Tests**

(i) **General**

- The laboratories in which the samples are to be tested shall be approved by the Engineer [preferably CMTL Lahore, UET(s)].

- The person representing to the Engineer shall have access to the laboratories to supervise and check the laboratory testing of the samples.

- The testing shall be carried out in accordance with ASTM or equivalent British Standards, or as directed by the Engineer.

(ii) **Tests**

The Contractor shall arrange to carry out laboratory tests on the specified samples of the subsoil material. The samples to be tested and the tests to be carried out for each sample shall be specified by the Engineer. Laboratory testing may include but is not limited to the tests listed below:

- Grain Size Analysis (Sieve + Hydrometer)
- Atterberg's Limits
- Chloride Content (soil and water)
- Natural Moisture Content
- Bulk and Dry Densities
- Organic Matter Content
- Magnesium Content (soil and water)
- Sulphate Content (soil and water)
- PH value (soil and water)
- Unconfined Compression Test
- Direct Shear Test
- Consolidation Test
- Total Soluble Salts.

(l) **Record**

The Contractor shall keep accurate logs and records of all the Work accomplished under this Contract. All such records shall be preserved in good condition by the Contractor until they are delivered and accepted by the Engineer. The Engineer shall have the right to examine such records at any time prior to their delivery to him. The following information shall be included in the records for each investigation borehole.

(i) Hole number or designation, coordinates, and elevation of the top of the hole.

(ii) Type of drilling operations.

(iii) Dates and time by depths when drilling operations were performed.

(iv) Depths at which samples were recovered and field-testing was performed including complete data of field-testing.

(v) Depth of Groundwater table from NSL.

(vi) Description of subsoil conditions.

The presence of the Engineer's Representative or keeping of separate records by him shall not relieve the Contractor of the responsibility for the

Work specified in this clause. Payment will not be made if the Contractor has not furnished the records.

(m) **Foundation design/designation (in light of confirmatory investigation)**

The contractor shall submit the foundation design/designation along with the following data/calculations to establish that the proposed foundation type is optimized and cost-effective for the review and approval of the Engineer:

- Necessary soil design parameters to verify the bearing capacity based on geological data (bore log) and laboratory test results i.e. from (a) standard penetration test & (b) analytical method.

- Immediate and consolidation settlements of soil.

- Seasonal fluctuation of groundwater (at least 1m from the observed).

- Cement type to be used for foundation construction (based on ACI-318 Table 4.3.1).

1.3 Access Roads

Access roads (limited to tower locations) having at least a 4.5-meter clear width shall be constructed by the Contractor following the specifications and drawings as and where necessary. Design of the aforementioned will also be the sole responsibility of the Contractor taking into account the geology (land sliding, soil stability etc.) and seismology of the area. The Engineer review and approval are binding before commencement.

Unpaved access roads require various operations including construction of approach roads, retaining walls (stone or gabion), pipe or box culverts, filling of ditches, blasting, dozing trails, and other works depending on the type of terrain and as approved by the Engineer. Suitable road approaches are required for safe access of equipment and vehicles. Proper surface drainage shall be provided to avoid cutting during rain. For easier accessibility during construction and later for inspection, operation, and maintenance of the transmission lines, unpaved access roads shall be located as near as possible to the transmission line route.

All access roads and finger roads shall be permanent for Employer operation & maintenance purposes and it is the responsibility of the Contractor to maintain them up to completion.

(a) If an access road already exists near the proposed transmission line route, only finger roads need to be constructed to get access to the new transmission line tower.

(b) Precautionary measures are to be taken to avoid any damage to the existing access roads. Any damage during construction shall be repaired/ rectified without any cost to the Employer.

(c) Widening of the already unpaved pathways in the area will be in the Contractor's scope if needed to make it an access road. Widening of unpaved pathways roads shall be made in such a way that the clear road width shall be at least 4.5 meter.

(d) The maximum grades for different types of terrain based on the specified design speed shall be the following:

Type of Terrain	Maximum Grade
1. Flat	13%
2. Rolling	17%
3. Mountainous	20%

(e) The material shall be placed with spreaders/heavy tractors. Compaction shall be as specified for traffic roads.

(f) In case the Employer/Engineer requires access roads along the route other than as specified above like for in-span hill cutting or for shifting of stringing equipment in between the span, the Contractor has to construct roads as per specifications and payment shall made as per rates of access roads available in BoQ.

1.4 Cable Cars/Ropeways

The contractor has to design, supply and construct cable car/sky rope with a 2.0 to 4.75-ton capacity. The cable car/sky rope will be electrically driven or by a petrol/diesel engine with brakes. The safety of persons and T&P will have to be the main objective while designing/installing. All material/mechanical components and construction (blasting, cutting, excavation, filling, shoring, dewatering, concrete, rebar steel, placing, etc.) are complete in all respects. The design has to be vetted by the Engineer before execution. All running and maintenance costs are also included. Periodic validation of installation is included in the Contactor scope of works. After the commissioning of the transmission line, all installations should be handed over to NTDC in complete healthy operational condition.

1.4. FOUNDATION REQUIREMENTS

(1) General

The items of the Price Schedules for constructing the various types of concrete foundations (including pile foundations) for steel towers include the following:

(a) Tower staking;

(b) Performing all clearing, grading, cutting, blasting, and levelling as required to construct the footings and erect the steel towers at the specified tower locations;

(c) Performing all required excavation, blasting (in all types of soil/ gravels & boulders/rock), dewatering, shuttering, curing, and compacting backfill for the concrete footings;

(d) Installing steel stub angles in the concrete footings;

(e) Tower grounding before placement of concrete;

(f) All concrete work for the concrete footings, including the cost of furnishing all reinforcing bars, and all materials for concrete;

(g) Installing pile foundations where required, including the cost of furnishing all reinforcing bars and all materials for concrete; and

(h) The foundation drawings included in Bidding Document are firm & final and only be changed (if required) as directed by the Engineer.

The specific requirements for performing the individual portions of the Work to construct the concrete foundations are included in the paragraphs pertaining to the individual Work to be performed.

(2) **Excavation for Tower Footings**

The Contractor shall perform all excavation required for constructing various types of concrete foundations for the steel towers.

Where foundations are installed on sloping or unstable ground the Contractor shall be responsible for ensuring the local and overall stability of the area, the safety of the public, and any other structure. Utmost effort should be made that the natural slope should not be disturbed by using unequal leg extensions or foundation with chimney extension to avoid unwanted landslides. To excavate and construct the foundation, vertical cutting to the adjacent natural slope is not allowed.

To protect the overall and localized stability of the natural slope, the adjacent natural slope shall be cut in steps (terraces) to prepare the multi-step platforms. The work methodology and drawings shall be submitted by the contractor to the Consultant for approval. Further stabilization shall be achieved by approved methods such as retaining walls, buttresses, gabion baskets/mattresses and stone masonry. The set level of the tower location on the sloping ground will be finalized by the Engineer's representative before excavation.

The tower sites shall be levelled and cleared of trees, brush, and stumps as may be required to construct the tower footings and to erect the steel towers. Cleared materials shall be disposed off, as directed by the Engineer or his nominated person.

All excavations shall be sufficient to provide concrete footings with dimensions not less than shown on the drawings.

After the Contractor has excavated the footing to the required depth, the Engineer's Representative will inspect the bottom of the excavation and determine if the bearing material is suitable for the type of footing designated for that location. If it is found that the bearing material is unsatisfactory for the type of footing designated, the Engineer or his nominated person will either designate another type of footing or ask for compacted crushed stone mixed with sand (50:50 ratio) to be placed underneath the footing for a depth of up to 1.2 meters. The Contractor will be paid only for the type of footing installed. However, no payment will be made for the additional excavation and replaced compacted material underneath the footing.

A maximum variation of 60 mm above or below the established grade will be permitted. However, if excavations are below the specified grade plus tolerance, those shall be backfilled to the required grade by the Contractor with the Contractor's furnished concrete at his own cost.

All excavated material that is suitable for backfilling as approved by the Engineer shall be laid aside to be used for backfilling at the tower site from which it was excavated. The backfilling shall be done in layers (not more than 300mm) with a roller compactor or plate compactor as approved by the Engineer. The excess material shall be spread evenly around the site as directed by the Engineer or his nominated person.

Concrete shall be placed as soon as practicable after each excavation is completed and all excavations shall be protected to maintain a clean sub-grade until the footing is placed, using dewatering, timbering, shoring, or casing, as necessary. Any sand, mud, silt, or other objectionable material which may accumulate in the excavation shall be removed at the expense of the Contractor before placing concrete. After the completion of the foundations, all the dewatering holes shall be filled with dry sand.

(3) **Rock Excavation**

Rocks shall be excavated to the depth required to provide a suitable base for the foundations as indicated on relevant drawings. Rocks are classified as sound and mashes, layers or ledges of mineral material 0.241 cubic meters in volume in place and of such hardness and texture that it cannot be easily loosened or broken down.

Rock excavation includes drilling, blasting, removal of drainage, and pumping as required. Drilling and blasting techniques shall keep over-break to a minimum and no extra compensation shall be paid for the removal of over-broken material. The contact surface of the rock shall be cleared of all loose rock and soil.

The Contractor shall familiarize himself and comply with the laws and local customs concerning the use, handling, and storage of explosives. The cost of any damage whatsoever caused by blasting shall be payable by the Contractor. He shall not be relieved of these costs despite having received approval of his methods from the Engineer.

(4) Concrete Foundations

Each tower foundation will have four footings and each footing will consist of a steel stub angle embedded in reinforced concrete. The footings for each tower in a tangent section of the line shall be placed so that the longitudinal axis of the tower cross-arm will lie in a plane perpendicular to the traverses of the line. Unless otherwise directed by the Engineer, the footings for each angle tower shall be placed so that the tower cross-arm will lie in a plane bisecting the interior angle formed by the intersection of the traverses of adjacent sections of the line.

The footings at the various tower sites shall be constructed following the criteria shown on the Specifications Drawings. The concreting can be done with rotary and buckets or portable concrete pump or a mobile truck with a transit mixer as approved by the Engineer.

Pile foundations will be required where the field and laboratory tests confirm the requirements. The pile foundations will be installed as shown on the relevant drawings and following these Specifications.

All pile foundations as shown on drawings are of a preliminary nature and depths of piles have been indicated for bidding only. The final design may vary for the length and diameter of the pile and other details shown on the drawings.

Any type of spread footing foundation may be changed to another type of spread footing foundation or pile foundation following field requirements during the execution of the project.

A brace beam may be required/constructed to tie all four footings of the tower as approved by the Engineer for which payment will be made from the Additional Works.

(5) **Placing of Stub Angles in Footings**

Stub angles shall be placed in the tower footings as shown on the drawings and shall be supported in the proper position using a rigid frame or equivalent suitable device to ensure placement of the stubs within the tolerances specified

below. The stub angles shall be held rigidly in a manner to prevent displacement during the placing of concrete. In the case of the use of a concrete block at the bottom of the stub, its minimum compressive cylinder strength should be 3000 psi at 28 days. The stub should extend into the footing pad and in case of cutting or making new holes in the stub no price compensation will be made to the Contractor

All stub angles for the tower legs shall be set accurately to the grade and alignment designated on the drawings and as directed by the Engineer. Work that is not within the tolerance will be corrected as directed by the Engineer and at the Contractor's expense. The setting tolerances following complete foundation installation including backfilling and compacting are as follows:

(a) Tower Center from theoretical location:

(i) Transverse ..... ± 150 mm
(ii) Longitudinal ..... ± 500 mm

(b) Tower Orientation (angular departure from the theoretical location measured at the point of intersection of a tower face and the longitudinal center-line) ..... 25 mm

(c) Difference in Elevation between working point marks on Stub Angles including diagonally opposite legs ..... 8 mm

(d) Departure from theoretical Horizontal Dimensions between tower centre line and working point marks on stub angle:

(i) Along the tower face ..... ± 5 mm
(ii) Along the tower diagonal ..... ± 7 mm

(e) Batter ..... 5 mm/m

(f) Twist (about the heel of stub angle) ..... 2°

(6) **Tower Grounding**

Tower Grounding shall be performed following the grounding schemes provided in the Specification Drawings.

Ground rods shall be driven at least 2.5 meters into undisturbed soil at the bottom of the footing excavation, as shown on the Drawings. The ground rod shall be connected to the stub angle by the specified ground wire. The connection of this wire to the ground rod and the stub angle shall be made by a bolted clamp following the drawings.

Where it is not possible to drive a ground rod an alternative grounding by installing 'crowfoot' shall be adopted following the specified drawing.

The resistance of the two rods/crowfoot in parallel shall be measured and recorded before concrete is poured for footings. If the resistance is more than 10 ohms, an additional grounding arrangement shall be installed as directed by the Engineer or his nominated person in accordance with the specified drawing until the time the specified grounding resistance is achieved. No extra payment would be allowed for excavation/blasting/laying/back-filling on account of this.

The dead-end terminal tower of the overhead lines must be connected to the earthing system of the grid stations.

(8) **Concrete**

(a) **General**

All concrete and reinforcement placed for tower footings shall conform to the requirements of this section.

At least 30 days before the beginning of concrete placement, the Contractor shall submit to the Engineer for approval, a design mix (along with quantity and source of each material) along with six (6) test cylinders using the actual materials to be incorporated into the Work. Approval of the design mix will in no way relieve the Contractor from meeting all the requirements of these Specifications. Whenever the Contractor proposes to use a different material source, a new design mix must be submitted and approved as outlined above. During construction if in the Engineer's opinion, the mix should be adjusted, the Contractor shall submit a new design mix as directed by the Engineer.

(b) **Materials**

The Contractor shall furnish all materials for use in concrete, including but not limited to cement, sand, coarse aggregate, water, reinforcing bars, admixture (including ground slag), and concrete curing compound. Air-entraining agent and curing compound shall be accepted on the Contractor's certification of compliance with specification requirements. However, the Engineer reserves the right to require submission of and to perform tests on samples of the agent and/or compound before the shipment and use in the Work at the cost of the Contractor.

(i) **Cement**

Cement shall meet the requirements of ASTM C150. The cement shall be free from lumps and properly packed in bags when used in concrete. Adequate provisions shall be made by the Contractor to prevent the absorption of moisture when cement is stored. Cement Type-I shall be used for all types of foundations other than those for which sulfate-

resistant cement Type-V is required by the Engineer. No extra payment shall be made to the Contractor in case of the use of sulfate-resistant cement. The volume of one bag of cement should be taken as 1.25 cubic ft.

Cement Mill Test Certificates, when requested, shall be provided for each shipment of cement. Under no circumstances shall the source of cement be changed without prior written approval of The Engineer.

(ii) **Sand and Coarse Aggregate**

Sand and coarse aggregate shall be furnished from any approved source. The sand particles shall be clean, hard, dense, durable, uncoated rock fragments that will pass a screen having 6.5 mm square openings. The sand shall be well-graded from fine to coarse and shall be free from injurious amounts of dirt, organic matter, and other deleterious substances.

The coarse aggregate shall consist of clean, hard, dense, durable, uncoated rock fragments, and shall be free from injurious amounts of flat and elongated pieces, organic matter, or other deleterious substances. The maximum size of crushed coarse aggregate for piles shall be 19 mm and for spread footings, pile cap, and tie beam 38 mm or as directed by the Engineer. The grading of these sizes shall conform to ASTM C33.

The Contractor shall submit, for testing and approval, representative samples of the sand and coarse aggregate proposed for use in the concrete work. All aggregates shall conform to the requirements of ASTM C33 including the Petrographic test. During construction, the Contractor shall also arrange testing of sand and coarse aggregate if directed by the Engineer to determine compliance with Specifications. The cost of all laboratory testing of these samples shall be borne by the Contractor.

(iii) **Water**

Water used for mixing concrete shall be clean and free from injurious amounts of oils, acids, alkalis, salts, organic materials, or other substances that may be deleterious to concrete or reinforcement and shall meet the requirements shown in Table 1 below. A complete chemical analysis of water shall be submitted before the start of construction work and shall be required for each new water source being chosen. The cost of all laboratory tests of the samples shall be borne by the Contractor. No change in water source shall be permitted without prior approval by the Engineer

TABLE-1

Total Dissolved Solids (TDS)	850 ppm (max)
Magnesium, Chlorides and Sulfates	300 ppm (max)
pH Value	6.5 – 8.0

(iv) **Reinforcing Bars**

Reinforcing bars shall be deformed bars conforming to ASTM Designation A615, Grade 60. Representative steel bar samples shall be collected from the site and tested in CMTL Lahore or UET(s). The testing shall be witnessed by the representative of the Engineer. The cost of all laboratory tests and traveling of the Engineer's representative shall be arranged/borne by the Contractor. Negative variation in weight [mass] maximum up to 2.0% of reinforcement bar(s) from the applicable weight [mass] per unit length prescribed in Table 1 of ASTM A615 will be allowed for bar(s) placement. The contractor will have to make adjustments in bar spacing/number of bars to accommodate the excessive negative variation in weight [mass] if greater than 2.0%. The contractor will not be allowed for bar(s) adjustment in case of overweight [excessive mass] of any deformed bar.

(v) **Protective/Sealing compound**

Bitumen emulsion protective coating conforming to ASTM C 309 shall be applied (at least two coats) to all exposed surfaces of concrete.

(iv) **Admixtures and Ground Slag**

Admixtures to be used in concrete shall be subject to prior approval of The Engineer and shall meet the following requirements:

(A) **Chemical Admixtures**

(i) Air-entraining admixtures shall conform to ASTM C 260, "Specification for Air-Entraining Admixtures for Concrete.
(ii) Water-reducing or water-reducing and retarding admixtures (Normal Plasticizers) shall conform to ASTM C 494, "Specification for Chemical Admixtures for Concrete", Type A or D, respectively.
(iii) High-range water-reducing or retarding admixtures (superplasticizers) shall conform to ASTM C 494, Type F, or G, respectively.
(iv) Only one of the Admixtures A, D, F, or G, shall be added at a time.
(v) Chloride-bearing admixtures shall not be permitted.
(vi) Super Plasticizers shall be checked for their compatibility with pozzolanic materials in blended cement concrete.

(B) **Ground Granulated Blast-Furnace Slag**

In the area where high sulfate & chloride contents are present in soil/water, finely ground granulated blast-furnace slag can be used as a cementitious material in concrete by replacing OPC/SRC cement by a maximum up to 30%. The properties of ground granulated blast-furnace slag should meet ASTM C 989.

The cost of all laboratory testing of these samples shall be borne by the Contractor. The contractor will not be paid extra for the procurement of ground granulated blast-furnace slag for the construction sites.

(c) **Composition**

The Contractor shall determine the proportions of the sand, coarse aggregate, and cement needed to provide concrete, meeting the requirements of these Specifications, and shall be approved by the Engineer. Concrete that contains 38 mm maximum-size aggregate shall have a cement content of not less than 380 kg per cubic metre and concrete which contains 19 mm maximum-size aggregate shall have a cement content of not less than 440 kg per cubic meter. 38 mm maximum size aggregate shall be used for spread footing, pile caps, and tie beams, and 19 mm aggregate for piles. The net water-cement ratio by weight shall not exceed 0.5. Surface water contained in the aggregate shall be included as part of the mixing water in determining the water content. The reinforced concrete design will be checked in accordance with the ACI Building Code.

The Contractor will take a minimum of three test cylinders (152 mm x 305 mm) per leg, and the average compressive strength at 28 days shall exceed 210 kg/cm^2 (3000 psi) and no individual test value should fall more than 35 kg/cm^2 (500 psi) from the minimum specified value.

The compressive strength of the concrete will be determined by the Engineer through the medium of test of (152 x 305 mm) cylinders made and tested in accordance with ASTM C39. The Contractor shall furnish all necessary sampling equipment such as slump cones, test cylinders, etc. at the site. This equipment is to be approved by the Engineer or nominated person by Engineer. The cost of the material lab tests shall be borne by the Contractor.

The use of calcium chloride in concrete will not be permitted.

In the event that the concrete cylinder fails to meet the specified strength requirements then in-place testing of concrete shall be conducted under the supervision of the Engineer. In-place as approved by the Engineer testing of concrete shall be conducted by one or a combination of the following methods:

(i) ASTM C42 “Test Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.”

(ii) ASTM C805 “Test Method of Rebound Number of Hardened Concrete.”

The use of calcium chloride in concrete will not be permitted.

The slump of the concrete shall not exceed 75 mm for conventional foundation, pile cap & tie beam, and 150-175 mm for piles.

(d) **Batching and Mixing**

Unless specifically approved by the Engineer, all concrete used on the Project shall be machine mixed. Hand mixing shall only be used when authorized by the Engineer, and shall be performed under his directions.

The sand and coarse aggregate shall be weighed and shall be proportioned on the basis of integral bags of cement unless the cement is weighed. After weighing, the materials may be proportioned on the basis of equivalent volumes. The Contractor shall provide equipment and shall maintain and operate the equipment as required to accurately determine and control the amount of each separate ingredient entering the concrete. Batching shall be such that combined inaccuracies in feeding and measuring the materials will not exceed 1.5 percent for water and weighed cement and 2 percent for sand and each size of coarse aggregate. The concrete shall be uniform in composition and consistency throughout the mixed batch, and from batch to batch, except where changes in composition or consistency are directed. The mixing time shall be at least 1.5 minutes for stationary mixers. Excessive over-mixing requiring the addition of water to preserve the required consistency will not be permitted. The temperature of the concrete, when it is being placed, shall be not more than 35°C and not less than 5°C in moderate weather or 10°C when the mean daily temperature drops below 5°C. Truck mixers will be permitted only when the mixers and their operation are such that the concrete throughout the mixed batch and from batch to batch is uniform with respect to consistency and grading. Any concrete retained in truck mixers so long as to require additional water to permit satisfactory placing shall be wasted.

(e) **Forms Preparation for Placing of Concrete**

Unless otherwise provided for on the Drawings or approved by the Engineer, all concrete placed will be monolithic.

Forms shall be sufficiently tight to prevent loss of mortar from the concrete and shall be maintained rigidly in position until the concrete has hardened sufficiently to prevent damage by form removal. All surfaces of foundations upon or against which concrete is to be placed shall be free from standing water, mud, and debris. The surfaces of absorptive foundations against which concrete is to be placed shall be moistened thoroughly so that moisture will not be drawn from the freshly placed concrete. The surfaces of construction joints shall be clean, rough, and surface dry when covered with fresh concrete. Cleaning shall consist of the removal of all laitance,

loose or defective concrete, coatings, sand, curing compound if used, and other foreign material. A mortar layer shall not be used on concrete construction joints.

The methods and equipment used for transporting concrete, and the time that elapses during transportation shall be such as will not cause appreciable segregation of coarse aggregate or slump loss above 25 mm in the concrete as it is delivered into the Work. Concrete may be transported from the mixer to the forms and deposited in the forms by any method approved by the Engineer such as transit mixers, buckets, chutes, and pumping. Aluminium pipe or chutes shall not be used for tremie trunk line, or chute for placing of concrete, or for the delivery of pumped concrete. Re-tempering of concrete will not be permitted. Any concrete which has become so stiff that proper placing cannot be assured shall be wasted. Formed concrete shall be placed in continuous approximately horizontal layers, the depths of which generally shall not exceed 500 mm. Concrete shall be vibrated (internal vibrators having a minimum frequency of 8,000 vibrations per minute) until it has been consolidated to the maximum practicable density, is free from rock pockets of coarse aggregate, and closes snugly against all surfaces of forms and embedded materials. Standby vibrators shall be available during concrete placement.

Exposed unformed surfaces of concrete shall be brought to uniform surfaces and worked with suitable tools to a reasonably smooth wood float or steel-trowel finish as directed. Concrete in the tops of foundations in which stub angles are embedded shall be sloped to provide drainage away from the stub angles.

(f) **Reinforcement**

Steel reinforcing bars shall be placed in the concrete were shown on the Drawings. Before reinforcement is placed, the surfaces shall be cleaned of heavy flaky rust, loose mill scale, dirt, grease, or other foreign substances. Reinforcement shall be accurately placed and secured in position so that it will not be displaced during the placing of concrete.

The Engineer shall not furnish supplemental bar-placing diagrams, bar lists, and bar-bending diagrams. Any such additional diagrams and bar lists of this type that the Contractor may require to facilitate the fabrication and placement of reinforcement shall be provided by the Contractor.

Reinforcement will be inspected for compliance with requirements as to size, shape, length, splicing, position, and amount after it has been placed.

Any bar-placing diagrams, bar lists, and bar-bending diagrams prepared by the Contractor shall conform to the requirements shown on the reinforcement design Drawings and shall be approved by the Engineer. Maximum two numbers (2+2) of bars in the pad and chimney can be lapped.

Lap splices shall be as under:

Bar#	3	4	5	6	7	8	9	10	11
Lap length (m)	305	360	460	610	840	1095	1400	1750	2160

(g) **Protection and Curing**

The Contractor shall protect all concrete against injury until final acceptance.

The concrete shall be cured with two applications (coats) at right angles to each other to ensure uniform and more complete coverage with approved bitumen emulsion protective coating to be applied as soon as possible after concrete placement/hardening. Curing with water shall be used only as an alternative and with Engineer approval. The application of the bitumen emulsion protective coating shall be the procedures outlined by the manufacturer. In the case of pile-cap & tie beam with form, ties are loosened and vertical forms are still in place water should be applied to run down on the inside of the form to keep the concrete wet. Immediately after form removal, the surfaces should be kept continuously wet by water spray or water-saturated fabric until the bitumen emulsion protective coating is applied.

A minimum of two applications shall be required, and the applications shall be 100 percent effective.

(h) **Repair of Concrete**

Any concrete that is damaged or defective from any cause; concrete that is honey-combed, fractured, or otherwise defective, and concrete damaged because of excessive surface depressions, must be excavated and built up to bring the surfaces to the prescribed lines, shall be removed and replaced and any imperfections and irregularities on concrete surfaces shall be corrected. The removal and replacement of damaged or defective concrete, and the correction of surface imperfections and irregularities shall be made with concrete dry pack, or mortar (Portland cement mortar), or at the option of the Contractor, with epoxy-bonded concrete, or epoxy-bonded epoxy mortar, where and as applicable for the type of repair involved. All repairs should be completed within 24 hours after removal of forms, and as directed by the Engineer or his nominated person. However, forms shall not be removed for at least 24 hours after the concrete work until it has acquired sufficient strength to safely carry its own weight and any construction loads that may be imposed on it.

(i) **Tolerances for Concrete Construction**

The Contractor shall be responsible for setting and maintaining concrete forms within the tolerance limits necessary to ensure that the completed Work will be within the tolerances specified or within good construction practices. Concrete work that exceeds the tolerance limits specified herein shall be inspected by the Engineer and he will determine what effect the deviations will have upon the structural action or operational function of the structure, and what remedies may be necessary. If after such inspection the Contractor is directed to remove or replace any defective Work, he will do so at his own expense.

(i) Tolerances for footings:

-	Variation from plumb or specified batter for lines and surfaces of stem	In any length of 3.0 metres ..... 13 mm Maximum for the entire length .....26 mm
-	Variation in cross-sectional dimensions of stems	Minus ..... 7 mm Plus ..... 26 mm
-	Variation from specified elevation for the top of concrete	Minus ..... 13 mm Plus ..... 13 mm
-	Variation of dimensions in plan	Minus ..... 13 mm Plus ..... 52 mm
-	Misplacement or eccentricity	2 percent of the footing width in the direction of misplacement but not more than ..... 52 mm
-	Reduction in thickness	by 5 percent of the specified thickness

(ii) Tolerance for placing reinforcing steel:

-	Variation of protection covering:	with a cover of 64 mm or less ..... 7 mm with cover of more than 64 mm ..... 13 mm
-	Variation from indicated spacing	..... 26 mm

(9) **Backfill for Tower Footings**

Backfill shall be placed about the tower footings to elevations indicated on the drawings or as directed. The material used for backfilling, the amount thereof, and the manner of depositing this material shall be approved by the Engineer. Where the excavated materials are insufficient in quantity or are not suitable, as determined by the Engineer nominated person, for use as backfill, the Contractor shall obtain suitable material from the borrow. No borrow pits shall be made within a 25-metre radius from the center of the tower. Backfill shall be placed about the tower footings as soon as practicable after removal of concrete forms, but not earlier than 8 hours from application of sealing compound or bitumen coating to concrete surfaces.

The excavated material not suitable for backfilling or above the backfilling requirement shall be spread evenly over or adjacent to the Site. The backfill adjacent to the footing stems shall be approximately 150 mm above the original ground and shall be graded and sloped uniformly away from the stems so that there is no pond at or around the footing.

In backfilling for concrete footings, the pad of the footing shall be covered with fine material of 300 mm thickness (after compaction) before any coarse material is deposited. Care shall be taken to avoid damage to the concrete when backfilling. The backfill material shall be clean and free from vegetation, pieces of timber, or other foreign matter. Suitable material for backfilling shall be a compatible granular material having a granularity within the following limits.

Sieve	% Passing
76 mm (3 in)	100
No. 200	0-15

(10) **Compacting Backfill**

Backfill shall be placed in horizontal layers which after compaction shall not be more than 150 mm thick. Each layer shall be compacted by tamping machines or other mechanical means approved by the Engineer.

Backfill shall be moistened properly where required. When excavated material is so wet that it is not suitable for backfilling, it shall be spread and aerated until the proper moisture content is attained, at which time the material shall be used as backfill around tower footings. The backfill material shall not be placed until all forms and timber used for shoring or bracing have been removed unless otherwise permitted by the Engineer or his nominated person.

The Contractor shall submit, for laboratory testing and approval, representative samples of the materials proposed to be used as backfill. Based on laboratory test results the Engineer shall specify the degree of compaction to be obtained

in the field, which shall not be less than 90% of the maximum dry density as obtained by ASTM D-1557.

Density shall be measured in the field according to ASTM D-1556 or ASTM D-2937 by the Contractor in the presence of a nominated person of the Engineer to determine compliance with the specified degree of compaction. The cost of all laboratory and field testing shall be borne by the Contractor.

(11) **Additional Foundations**

In case other foundations are required to be installed, which are of a different design than the specific types listed, the Contractor shall install these foundations as directed by the Engineer. All work performed will be following these Specifications. Payment for additional foundations will be made at the applicable unit prices provided in the Price Schedules for similar works.

(12) **Foundation Test (Not Required)**

The Contractor may be required to perform an uplift load test on any one footing for a double circuit suspension type tower. The Engineer will designate the location and type of footing to be tested. All methods, procedures, equipment, jigs, apparatus, etc., shall be subject to approval by the Engineer. No testing shall be commenced until 28 days after the final concreting nor until all backfill is placed and compacted as specified herein.

An uplift load shall be applied until a design value is reached or the footing fails. The rate of load application will be determined by the Engineer.

1.5 EROSION/SLOPE PROTECTION

For erosion protection against water current, gravel blankets shall be placed, as per Specification Drawings with the approval of the Engineer, such that they do not flow away with water current. These gravel blankets shall be placed at or adjacent to tower sites in the manner directed by the Engineer or his nominated person. Gravel for the blankets shall be furnished by the Contractor, and it shall be pit-run, free draining, containing no stones larger than 635 mm size obtained from the closest source approved by the Engineer or his nominated person. The gravel shall be reasonably clean and free from vegetation, pieces of timber, or other foreign matter, and shall be distributed and graded evenly over the required areas. To protect the overall and localized stability of the natural slope, the adjacent natural slope shall be cut in steps to prepare the multi-step platforms. The work methodology and drawings shall be submitted by the contractor to the Consultant for approval.

Slope protection will be provided for foundations, as per Specification Drawings with the approval of the Engineer, which are located/placed on uneven ground, sloping terrain in the hilly areas, and/or they are partially or fully exposed in such a way that designed over-burden cannot be provided on these foundations safely. Slope protection shall include but not be limited to the construction of retaining walls of

stone masonry to a height and depth so as to provide adequate protection and necessary burden by making a leveled platform with stone mortar after filling with earth as per Specifications Drawings or as directed by the Engineer. Where in the opinion of the Engineer, gabions are required for the protection of the foundation these shall be installed as per the following specifications:

(a) The gabion wire mesh workship, strength, and block sizes shall conform to ASTM A975. The size of a typical gabion wire mesh shall be 83x114x3.05mm. The length, width, height, and number of cells of gabion blocks shall be as per ASTM A975. However, typical sizes of gabion blocks may be adopted as 1.5mx1.0mx1.0m, 2.0mx1.0mx1.0m, and 4.0mx1.0mx1.0m as required.

(b) The box gabion shall be a rectangular basket fabricated from a double twist, hexagonal mesh of soft annealed heavily galvanized wire. It shall be filled with rounded river or quarried stone of suitable size.

(c) All the edges of the main base and end panels shall be reinforced with galvanized wire of greater diameter. The selvedges wires, in addition to strengthening the basket, facilitate its assembly and assist in keeping it square.

(d) Where there is more than one course of gabions, the ones in the upper course shall be securely laced to those below.

(e) An un-weathered (sound) naturally occurring angular or crushed hard rock material can be used for filling. Stone for the Gabion facia shall be hard, angular to round, durable, and of such quality that they shall not disintegrate on exposure to water or weathering during the life of the structure. The minimum and maximum size of the stone used for filling shall be 1.5 to 2.5 times the mesh opening. Each range of sizes may allow for a variation of 5% oversized rock by the number of particles, 5% undersized rock by the number of particles, or both. The rock pieces should be properly hand-placed and packed with their larger dimensions in the horizontal position. The size of any oversized rock shall allow for the placement of a minimum of three layers of rock must be achieved when filling the 1 m high units and a minimum of two layers for the 0.50 m high gabion units and 0.3m thick gabion mattress. Los Angeles abrasion value is Not more than 45.

(f) After filling the gabions slightly over-full, to allow for subsequent settlement, the lid shall be laced down with binding wire to the tops of all sides and diaphragm panels.

1.6. PILE FOUNDATIONS

(1) **General**

(a) **Description of Work**

The Work to be performed under these Specifications shall be carried out at the proposed site of towers after the field and laboratory test results confirmation. The Work includes, but is not limited to the following:

(i) Construction of bored, cast-in-place reinforced concrete piles as shown in the Drawings.

(ii) Complete borehole logs and record all operations performed during the investigations and the execution of the Work.

(b) **Location of Investigation Borehole and Piles**

(i) The location of investigation boreholes and piles on the ground shall be established by the Contractor following the Drawings and from reference points to be provided by the Engineer. Establishing the investigation borehole and pile locations accurately in the field shall be the sole responsibility of the Contractor.

(ii) The Contractor will provide the levels, survey, and ground elevations for each investigation borehole and pile location. The elevations will be given for permanent benchmarks in the vicinity of the Site.

(c) **Diameter and Length of Piles**

Bored, cast-in-place reinforced concrete piles shall be constructed having uniform diameters throughout the length as specified in the relevant drawings. Pile footings shall only be installed where the field and laboratory tests confirm the requirements. The final length of the piles shall also be confirmed after testing.

(d) **Drillers and Supervisory Staff**

The Contractor shall have at Site, at all times only qualified, experienced, orderly, and thoroughly competent persons including graduate engineers/geologists who shall conduct and supervise drilling operations and piles construction.

(2) **Execution of Piles**

(a) **General**

This clause covers all the work necessary for the execution of the bored, cast-in-place reinforced concrete piles namely:

(i) Formation of ramp

(ii) Drilling and stabilizing of boreholes for the piles.

(iii) Placing of steel reinforcement.

(iv) Mixing and placing of concrete.

The Contractor shall perform all such work following the requirements of this clause as well as following the methods as proposed by him and approved by the Engineer.

(b) **Method of Drilling**

The drilling of holes for piling shall be done by mud circulation or reverse rotary or percussion method or any other method suggested by the Contractor and approved by the Engineer. Regardless of the method used for drilling holes, drilling operations shall be carried out in such a way as to avoid any disturbance of the surrounding soil especially at the bottom of the hole and successful drilling through all types of soil/rock/boulders.

(c) **Stabilizing of Holes**

There will be no permanent casing installed. Any temporary protective casing at the start of the drilling shall be later pulled out. The stabilizing of the drilled holes shall be achieved by using natural or commercial drilling mud/bentonite. Permanent casing shall only be allowed with the prior approval of the Engineer.

(d) **Tolerances**

Tolerances for setting out and for concrete construction shall conform to Clause 9.4 of these Technical Provisions. In the case of piles, deviation from the vertical shall not exceed one percent on any section of the length of the holes.

(e) **Concrete**

All concrete and reinforcement placed in the construction of piles shall conform to the requirements of Clause 9.4(8) of these Technical Provisions. In addition to this, the following requirements shall also be fulfilled.

(i) Promptly after cleaning the hole to the entire satisfaction of the Engineer Representative, concrete shall be placed in a manner that will not cause segregation of the particles or permit infiltration of water or any other occurrence which would tend to decrease the strength of the concrete or the capacity of the finished pile. The slump shall be limited to 150mm minimum and 175mm maximum.

(ii) The minimum clear distance between vertical reinforcement, including lapped bars, shall be 4 inches (if applicable).

(iii) Either tremie or pumped-in concrete can be used in the presence of water or drilling mud. Tremie or pump pipe shall be made of steel and have watertight joints. Tremie pipe shall have a minimum diameter of 8 inches, and pump pipe shall have a minimum diameter of 4 inches should be used. Embed tremie or pump pipe a minimum of 3 meters in the concrete throughout concreting. The method and equipment used shall be subject to the prior approval of the Engineer.

(iv) Concrete placement shall proceed without interruption until the pile is complete.

(v) Vibrate the top 3 to 4 meters of concrete after the temporary casing has been withdrawn.

(vi) The Contractor shall make three test cylinders per pile or as directed by the Engineer during the concreting of piles.

(vii) The vertical bars of the pile can be coupled together as directed by the Engineer according to the site requirement.

(viii) The inner dia of the stand casing/permanent casing should be at least 25mm larger than the pile dia, whereas the bit dia should be equal to the pile design dia.

(f) **Record**

The Contractor shall keep accurate logs and records of all the Work accomplished under this Contract. All such records shall be preserved in good condition by the Contractor until they are delivered and accepted by the Engineer. The Engineer shall have the right to examine such records at any time before their delivery to him. The following information shall be included in the records for each pile.

- A general description of sub-soil conditions and water table position at the location of the pile.

- Pile number, the ground elevation of the borehole, and elevation of the top of the pile.

- Type of drilling operations.

- Date and time by depths when drilling operations were performed and piles constructed.

- Total depth of each borehole.
- Quantity of concrete and steel used for the construction of each pile.
- Quantity of constituents for each batch of mix, water-cement ratio, and the results of all quality control tests.
- Time of start and completion of Concrete.
- Remarks concerning any unusual occurrence during drilling and concreting of piles.

1.6.1 Tower Erection

(1) **General**

The contractor's work includes the supply of manpower, providing construction equipment, vehicles, and rigging tackles for the complete assembly of towers.

Erection shall be done strictly following the approved Contractor's drawings, material lists, and approved construction data sheets.

No tower shall be erected **until seven days after the last concrete** was placed in the foundation, nor until the backfill has been completed where and as required.

The Contractor shall follow the procedures laid down in the IEEE Guide for the Assembly and Erection of Metal Transmission Structures (Latest Edition) and mentioned herein below.

(2) **Handling**

Tower steel shall be handled to prevent deformation of the members and damage to the galvanizing. Materials shall not be dumped, dragged, barred; rolled, or dropped but shall be carefully loaded, unloaded, and stored. A mechanical means such as a hoist or crane shall be used when material cannot be properly handled or placed by hand.

Bare wire rope or steel chains shall not be used for handling without adequate protection of the surface coating. Heavy members shall not be stacked on top of lighter members. Structural members shall be stored according to size, length, and markings. The maximum weight of steel bundles shall not exceed a specified weight, typically 1600 kg to 1800 kg, to facilitate handling and unloading. Members with dissimilar finishes shall not be stored over one another to minimize discoloration of the lower members.

All members shall be placed on wood blocking or other suitable material to ensure that the materials to be stored are not in contact with the ground. Blocking shall also be used to separate layers of stacked materials. Members

shall be supported in such a manner as to prevent bending and distortion as well as to allow water to drain from the materials.

Failure to provide for proper drainage of stacked galvanized steel members could result in the formation of white rust. White rust (zinc oxide) forms when two galvanized surfaces are closely rested for an extended time without adequate ventilation. Ingress of water between the surfaces forms an electrolytic cell, which may, in time, erode some of the zinc layer. The white rusting action will stop after exposure to air. Spacers placed between the nested pieces ensure adequate ventilation when extended transport storage is anticipated.

The material yard shall be kept relatively neat and clean and the growth of vegetation kept to a minimum. Good housekeeping minimizes damage and loss of material handling; periodic physical inventories and complies with environmental considerations.

(3) Assembly Methods

All assembly and erection shall be done by methods and equipment that will not cause damage to, or distort any part of the tower. Extreme care shall be taken to establish and maintain the true geometric shape of the sections of the tower assembled.

Preassembly techniques are generally influenced by site terrain and available equipment. Generally, the larger the section that can be pre-assembled, the more efficient the assembly/erection operation. Preassembly techniques shall consider the placement of the assembled sections to provide for the most efficient, safe lifting for erection. Structural assemblies, which are not sufficiently rigid to be raised in one piece, shall be stiffened using adequate temporary bracings.

Towers assembled on the ground shall be placed on suitable blocking to be kept free of dirt, mud, or other foreign material that might adhere to the structure and damage the coating. Blocking shall be placed in such a manner as to provide a flat surface to prevent overstressing or distortion of members and to maintain the true geometric shape of the assembled members. Mud, dirt, white rust, and other foreign material shall be removed from the contact surfaces of joints before assembly. Steel members shall not be dragged over the ground or otherwise handled in such a manner as to damage the galvanizing.

The structures shall be assembled following the fabricator’s erection and detail drawings. The diameter, type, and length of bolts as shown on these drawings shall be used for each connection. Orientation of bolts can facilitate access, final tightening, and installation of locking devices and subsequent checking of the erected structure. Tower bolts shall normally be installed so that the nuts are to the outside of the tower or, in the case of horizontal members, to the top of the connection unless such positioning is impracticable.

Installation of bolts by hammering or any method that damages the galvanized coating shall not be allowed.

When sections of towers are being assembled before erection, assembly shall be on blocks that will provide support, sufficient to prevent distortion of tower steel. If all bolts in an assembly are not inserted, at least 50 percent of the bolts in each connection shall be inserted and those bolts shall be finger-tightened only. All bolts in an assembly shall be inserted before any bolt in the assembly is fully tightened.

Only wrenches that properly fit the nuts and bolt heads shall be used, it will be preferable to use hydraulic torque wrenches for bolt tightening. The use of wrenches, which in any way deform the nut or cut or flake the galvanizing is prohibited. All bolts shall be entered clear to the head. All 16 mm diameter bolts shall be tightened to a torque of 10-14 kg-meters and 20 mm and 24 mm diameter bolts to a torque of 17-23 kg-meters. All bolts after torque shall be center punched adjacent to the nut to prevent loosening of the nut. This method of locking the nuts will be used instead of locknuts.

(4) **Method for Erection**

Towers shall be erected by any suitable method in the sequence best adapted to the equipment, workers' experience, and site conditions which will not overstress structure members.

When handling assembled portions of the structure, spreader bars, or other devices with proper points of attachment shall be used to avoid distorting or overstressing members and maintaining the true geometric shape of the section.

Adequate tag lines shall be used to ensure that no section of the tower being lifted will drag on the ground or against any section of the tower already erected.

Temporary guying may be required when erecting a structure in sections. Any temporary guying system shall be checked to ensure that the structure section is stable before workers are allowed to work on the section.

Structures shall be completely erected, and correctly oriented, with all members in place, all bolts installed and properly tightened, and the entire structure checked following the specifications before the installation of insulators, conductors, and shield wires.

When erecting structure members or sections in the vicinity of energized lines, care shall be taken to ground these members or sections before any workers come in contact with them.

The use of a crane erection is generally an efficient method of erecting latticed steel structures. With ground pre-assembly of sections, the time spent in final erection can be greatly reduced.

Cranes with telescoping booms can be more efficient than rigid boom cranes in rough terrain. Considerable productivity can be lost in the process of assembly and disassembly of rigid boom cranes. In addition, continuous handling of boom sections can lead to boom damage. Preplanning of the crane location at the structure site allows for any necessary grading work (building of ramps, soil stabilization, etc.) to be accomplished during the foundation construction operations when suitable equipment is available at the site. Depending on soil conditions, additional bearing support may be required under outriggers, tracks, and tires. All soil shall be returned to a condition acceptable to the Engineer after erection.

A Gin Pole is a boom of steel or aluminum pipe, wood pole, or latticed truss secured at its base and usually inclined at a slight angle to the vertical is also used for tower erection. Two wire-guys about 60^{o} to 90^{o} apart in the plan view are attached to the top of the gin pole to resist or support the load to be lifted. For safety, a third, and preferably a fourth guy, is installed in front to prevent the pole from falling over backwards in the event of an unexpected impact or the sudden release of load.

(5) **Correction of Mis Fabricated and Damaged Steel**

All shop errors and damaged steel shall be reported to the Engineer who will decide how corrections shall be made. All costs incurred due to punching, drilling, or cutting shall be deemed to be included in the steel erection cost.

Pieces bent in handling may be used if they can be straightened to the satisfaction of the Engineer, without structurally damaging the metal. If bent pieces cannot be satisfactorily repaired, they shall be replaced.

Field punching or drilling of holes and field clipping shall be done only with the approval of the Engineer if the hole or clip was missed in the fabrication of the member but was called for on the fabrication detail drawings. The edges of clipped angles, new or reamed holes, or any member which has its coating scratched or damaged shall be repaired with a coating approved by the Engineer. Members having mis-punched holes shall not be repaired by welding and shall be replaced with correctly fabricated members. If the field fabrication of a member is required, the bolt spacing and edge distances shall follow the fabrication detail drawings.

Reaming shall be done only with the approval of the Engineer and will be permitted, for the correction of undersized holes, for removing excessive galvanizing, and for holes off gauge line, to the extent that the connection cannot be made by loosening bolts in related connections. No hole shall be reamed more than one-eighth of its original diameter.

Reaming to remove fitting difficulty due to improperly set footings, to correct improper tower assembly and erection, that would distort holes or distort any member, or that would damage the galvanizing, is prohibited.

(6) Damage to Galvanizing

Small areas of galvanizing damaged by abrasion, in straightening bent pieces or by necessary clipping in the field, shall be repaired by carefully cleaning the affected area and painting. The paint will be furnished by the Contractor.

The damaged area shall be wiped with clean rags saturated with Xylene or equivalent solvent, followed by wire brushing then re-cleaned with solvent to remove residue, and painted with one coat of "Galvanox", or approved equivalent.

Galvanizing damaged by drilling or punching shall be repaired by applying an Aluminum paste or zinc-rich coating material to fill all voids between the bolt and the surfaces bared or all exposed steel surfaces around the holes or on cuts on which such corrective work is permitted. The coating material shall be "Galvanox" or the approved equivalent.

(7) **Tower Signs and Aerial Markers**

a) **Material**

All the plates i.e., danger sign, number & phase plates, and aerial markers shall be baked ceramic surfaces on high-grade steel base plates of a minimum thickness of 1.5 mm except the aerial marker plate which shall be of 3.0 mm thickness. The fabrication details and dimensions of the plates are shown on the Specifications Drawings.

The plates shall be painted with ceramic paint on both sides and shall be thoroughly cleaned before painting and the ceramic paint shall completely cover the front and back of the plates and also the edges of plates and the interior edges of the attachment holes. The ceramic paint shall be of even thickness, reasonably free from cracks, patches, pinholes, and blisters, and shall have a uniform gloss. The ceramic paint around the holes shall be protected using fiber washers.

Three coats of ceramic paint shall be applied to the danger sign and number plates. The first coating of black ceramic paint shall be applied on both sides of the plates. The other two coats of white ceramic paint shall be applied on the front side of the danger & number plates and yellow on aerial marker plates.

In the case of phase plates, three coats of ceramic paint shall be applied. The first coat of black ceramic paint shall be applied on both sides. The

other two coats of red, yellow, and blue colour shall be applied as specified on both sides of the plate.

Nos. of bolts, nuts, washers, and fixtures where required shall be supplied with each plate as shown in the drawings. Bolts, nuts, and washers to be supplied with the fixture shall be galvanized following ASTM A153.

b) Acceptance Tests

The following acceptance tests for Sign & Number Plates and Aerial Markers shall be carried out:

(i) Visual examination
(ii) Verification of dimensions
(iii) Galvanizing test (on fixture and nuts & bolts only)
(iv) Resistance to thermal shock (vitreous enamel finish)

(i) Visual Examination:

Examination	Defects
a. Construction	Not of the shape given in relevant Drawing. Any crack on the nut& bolt.
b. Material	Not of proper material.
c. Finish	Galvanizing of bolts, nuts, washers, and fixtures not proper, presence of black spots, blisters, flux, dress, un-coated areas, or any other defects. Bolts and nuts, rusty. Threads marred. The plates are not properly enameled and presence of cracks, patches, pin-holes, blisters, or any other defect. Letters and numbers are broken or not properly enameled.
d. Marking	Missing or incomplete or not as per drawing.

(ii) Verification of Dimensions:

Dimensions of the danger, number, aerial markers, phase plates and fixtures shall conform to those given in the Specifications Drawings with allowable tolerances as marked on the individual drawings. Any variation from the specified dimensions shall constitute a defect.

(iii) Galvanizing Test:

The galvanizing of the nuts, bolts, washers and fixtures shall be tested following ASTM Specifications.

(iv) Resistance to Thermal Shock:

This test shall be carried out by subjecting the test specimen to radiant heat to reach a steady temperature of 185-195°C in about ten minutes. The temperature shall be measured using a surface pyrometer in contact with the top surface of the heated part of the specimen.

Remove the radiant heat and within 5 seconds quench the surface with 1000 ml of water at 15-20°C direct from an aspirator or other container through a 5 mm diameter tube, the end of the tube is 150 mm above the center of the heated portion of the test specimen. The flow rate of water shall be adjusted to 10 ml per second. It is convenient to mark the test area to ensure that the water is correctly applied. Dry the plate, replace it in the same position under a radiant heat source and repeat this procedure until six cycles have been completed.

After subjecting the test specimen to the above test, the vitreous enamel surface shall be considered to be resistant to thermal shock provided that the enamel shows no signs of flaking-off or crazing.

Sampling, Acceptance and Rejection:

Danger, number, phase plates, aerial markers and fixtures offered for acceptance shall be divided into lots containing up to 200 units in each lot. A sample of 12 units (3 each from danger, number, phase and aerial marker) shall be drawn at random from each lot. For the thermal shock test, two samples each shall be randomly selected from the offered lot.

The selected samples shall be subjected to the visual examination, verification of dimensions and galvanizing. If the number of defective units is two, the lot shall be accepted. If the number of defective units is more than two the lot shall be rejected. If the number of defective units is three, another sample of 12 units shall be selected at random and subjected to tests. If the number of defective units is three or more then the lot shall be rejected and if the number of defective units is less than three then the lot shall be accepted.

c) Installation

Tower signs (danger sign and number signs) shall normally be installed on the tower so that they will be readily visible when viewed in the direction of increasing tower numbers. However, if signs installed in the normal position will not be readily visible from a permanent access road, they shall be installed on the tower faces best exposed to view from the access roads. These signs shall be supplied by the Contractor, and before the manufacturing, a sample shall be submitted to the Engineer for approval.

Aerial markers shall be installed on the upper side of the bridge structure, as shown on the drawings. Two markers shall be installed on every tenth

tower of the line; one marker faced back on line and the other ahead online. These shall also be supplied by the Contractor.

(8) **Anti-climbing Devices**

a) Material

Material, dimensions, and testing of the barbed wire shall be following ASTM A121.

The size and characteristics of the zinc-coated barbed wire shall be as per design number 12-2-4-14R, Type Z with Class 3 coating.

The material of structural steel of anti-climbing devices shall be a maximum of mild steel as per ASTM A36 and galvanization according to ASTM A153.

b) Acceptance Tests

The following acceptance tests for barbed wire shall be carried out:

(i) Visual examination
(ii) Verification of dimensions
(iii) Galvanizing
(iv) Physical
(v) Mechanical

These tests shall be carried out on the selected samples as per the test procedure defined in the relevant ASTM specification.

c) Installation

An anti-climbing device will be installed on each tower as shown on the relevant drawings. The anti-climbing device normally will not be installed until all the tower and wire stringing work is completed.

The tower steel will be provided with holes for mounting the anti-climbing device brackets. The brackets shall be fabricated from mild steel and shall be galvanized following ASTM A153. The brackets along with barbed wire shall be supplied by the Contractor. Any holes required to be punched/drilled for installation of Anti-climbing Devices and application of Galvanox shall be carried out by the Contractor without any extra cost.

Anti-climbing devices will be provided with an arrangement of barbed wire around the tower to prevent unauthorized person(s) from climbing the tower.

After erection, the tower shall be cleaned of any foreign matter.

(9) **Supporting Device for Joint Boxes of OPGW**

Supporting devices for joint boxes of OPGW to be designed, manufactured, and supplied by OPGW Contractor will be installed on the towers where joint boxes are required to be installed. Joint boxes will be installed on the tower on completion or just before completion of each OPGW reel of about 3.2 km length or wherever particularly required. The holes required to be drilled in the tower braces for installation of these supporting devices including the provision and application of Galvanox at the holes drilled shall be the responsibility and the cost of the Contractor.

(10) **Welding of Nuts & Bolts**

All nut & bolt connections of all types of towers shall be welded according to Specification Drawings, up to 8.0 m height from the top of the chimney.

1.7 Installation of Insulators and Hardware

Insulators and insulator hardware shall be assembled and installed as shown on the drawings and following the recommendations of the Contractors.

The Contractor shall follow the procedures laid down for the installation of Insulators and Hardware in the IEEE Guide for the Assembly and Erection of Metal Transmission Structures (Latest Edition) and mentioned herein below.

No insulator with chips or cracks in the glass or defects in the fittings shall be installed.

Uncrated or otherwise unsupported strings of insulators shall not be picked up or suspended except by the upper units of the string. All cotter pins installed by the Contractor shall be checked.

All insulators shall be cleaned with a clean cloth when installed. The glass shall be bright and all other parts free from dirt. Only clean rags free from any abrasive material shall be used for cleaning insulators.

Wire brushes shall not be used for the cleaning of any parts, metal or otherwise. The use of solvents will not be permitted.

Each completed suspension assembly shall be adjusted to hang in a vertical plane through the axis of the tower. Where it would be possible, nuts, locknuts, and cotter pins shall be placed to face the tower body.

Workmen shall not climb on insulators during conductor-pulling operations.

When raising conductor strain assemblies, the insulators shall be kept under tension to avoid the possibility of those being damaged due to excessive bending.

1.8 Stringing Conductors, Overhead Aluminum Clad Shield Wire and OPGW

(1) General

The conductor, overhead shield wire and OPGW shall be installed as shown on the drawings and as specified herein.

The Contractor shall follow the procedures laid down in the IEEE Guide for the Assembly and Erection of Metal Transmission Structures (Latest Edition) and mentioned herein below.

(2) Safety Grounding

It shall be the Contractor's responsibility to take adequate safety precautions to protect his employees and others from the potential voltage build-up during construction. The voltage build-up may be comparatively small during normal operations but could be lethal during switching and ground fault conditions on the energized parallel line. The following minimum safety and grounding procedures shall be followed by the Contractor during stringing operations in the Sections with parallel existing high-voltage lines.

Temporary electrical grounds shall be placed at both ends of the section requiring special safety precautions and at intervals along the line which is under construction. The grounding sets installed at both ends of the section of the line shall remain in place until the completion of the work and shall be removed as the last phase of the cleanup. Hot sticks shall be used for installing and removing the grounding sets.

All temporary grounds furnished and installed for protection shall be visible for inspection and shall be flagged by the use of a red cloth placed at the point of grounding. All grounds, except those placed at both ends of the section, and red flags shall be removed when they are no longer needed for protection.

All pulling and tensioning equipment shall be bonded and effectively grounded with approved-type driven grounds securely attached to the equipment. At least two driven grounds shall be used at both the pulling and tensioning set-up. All conductive parts of the tensioning set-up and equipment shall be operated from a grounded or insulated platform provided with barricades or insulated walkways.

Running grounds shall be installed within 6 meters of the tensioning set up to constantly ground each sub-conductor, overhead shield wire, and OPGW. At the pulling set-up, grounding shall be achieved by the use of block grounds connected to the adjacent tower by approved-type ground leads bonded to the tower with approved-type clamps. These connections shall be removed by the use of a hot stick.

An approved-type driven ground shall be located at each side and within 3 meters of working areas where conductors or overhead shield wires or OPGW are being compressed to dead-end assemblies or spliced at ground level or jointed. The two ends to be spliced shall be effectively bonded together before and during the splicing operation. Splicing and compression operations at dead-end assemblies shall be carried out on either an insulated platform or on a conductive metallic grounding mat roped off with an insulated walkway provided for access to the mat.

Installation and removal of temporary jumpers, at any time the conductor is not continuous, shall be performed by hot stick methods.

All conductors, overhead shield wires, and OPGW shall be bonded to the tower with approved-type tower grounds at any isolated tower where it may be necessary to complete the Work. Work on dead-end towers shall require grounding on both sides of the tower. Grounds may be removed when the Work is completed, providing the line is not left open-circuited at an isolated tower at which work is being completed.

For all sections of the line under work, which are not in parallel with energized high voltage lines or otherwise requiring special safety precautions, only the provision of the grounding at the pulling and tensioning stations shall be required.

All provisions specified herein shall not prevent the Contractor from installing as many additional grounds as deemed necessary for the protection of workmen against static and accidental contacts with foreign circuits.

Clipping crews and all others working on the conductive pulling lines, isolated conductors, overhead shield wires or OPGW shall be protected by individual hot stick clamp-type grounds installed at every work location.

(3) **Approved Type Grounding Material**

Approved type moving grounds shall be such as to exert constant pressure on the conductor, overhead shield wire or OPGW, and the contact rollers shall be with permanently lubricated-type bearings.

Approved-type driven ground rods shall be a minimum of 16 mm diameter copper weld or equivalent. Ground rods shall be driven into the ground a minimum of 2.5 meters.

Approved-type tower grounds shall be hot stick clamp grounds, bonded to the tower with a flexible ground lead.

Approved-type ground leads shall be at least 43 mm^2 cross-section copper or equivalent.

Approved-type insulated platforms shall be constructed of 65 mm nominal dimension lumber supported on 102 mm nominal dimension sills, or of materials of equivalent insulation.

At the tensioning set-up, the insulated platform and rope barriers shall extend completely around the equipment set up in such a manner as to prevent anyone standing on the ground from contacting any conductive part of the equipment.

(4) **General Safety Precautions**

Before initiation of the stringing in any section of the line, the following shall be ensured.

(a) The installation of all towers within the section of the line is satisfactorily completed.

(b) The stringing loads will not exceed the design loads for any of the towers.

(c) If any tower is to be subjected to loads exceeding the design loads, the Contractor shall provide temporary bracing for such tower, and the bracing is subject to approval by the Engineer.

(d) The stringing and sagging operation is such that no sudden loads will be applied to the towers.

(5) **Safety Precautions at Crossings**

Wherever any power line, communication line, highway, or railroad is to be crossed, the owners shall be notified 30 days in advance and all temporary changes shall be pre-arranged.

The Contractor shall not erect towers near, or string conductors or overhead shield wire, or OPGW over energized power circuits until a Hot-Line Order is placed on the energized line.

Qualified personnel shall remain at the site of work while the Hot-Line Order is in effect and shall ascertain that all personnel are clear and properly notified before the Hot-Line Order is released.

All existing lines which are de-energized for crossing shall be short-circuited and grounded at each side of the crossing.

Guard structures shall be provided at all crossings, as required for the protection of the conductor, line, road, structure, or feature being crossed, and as required by the owner, or the Employer.

Guard structures shall be of sufficient strength and stability to withstand the stresses to which they may be subjected.

As soon as a guard structure has served its purpose, it shall be removed and all holes shall be backfilled.

(6) **Atmospheric Adverse Conditions**

All pulling and stringing operations shall cease when either wind velocities are such as to cause conductors to deflect more than 1.5 meters at mid-span from the normal no wind position or there is any indication of lightning activity in the area.

(7) **Handling and Stringing of Conductors**

The conductor will be furnished in matched sets of twenty-four (24) reels and shall be strung by the controlled tension method. At no time the conductor will be allowed to contact the ground or any object which might cause damage to the conductor.

All reels shall be inspected in the field before installation. Reels showing signs of careless or unusually rough handling, such as split frames or crashed outer protective lagging shall be inspected carefully for conductor damage.

Preparatory to un-reeling a conductor from the reel, the outer protective lagging shall be removed carefully, and all surfaces in contact with the running conductor shall be examined for protruding objects which might damage the conductor.

Care shall be taken to ensure that no dirt is carried by the conductors from the reels. Reels shall be properly cleaned before starting the stringing operation of any line section.

A spreader bar shall be used when lifting or lowering the reels. Full or partial reels shall not be dropped or rolled under any circumstances.

The four conductors in a bundle shall be strung simultaneously and shall hang in stringing blocks for the same period not exceeding 24 hours and, in exceptional cases, up to 48 hours before being sagged to the specified sag.

Four conductors shall start and end approximately at the same points of the line and stringing operations shall be planned to keep waste to a minimum. Lengths of conductors less than 100 meters are scrap lengths and shall not be spliced into the line without the approval of the Engineer. Jumpers shall be cut only from scrap lengths unless otherwise permitted.

Stringing sheaves may be hung on the insulator strings or in straps of equal length attached to the structure arms with suitable hooks or clamps. The sheave shall support the conductors at the same elevation as when clipped in.

Uplift rollers that attach to the traveler or hold-down blocks that are separate devices must be used at positions where uplift might occur. Uplift can occur with the pulling line during the stringing operation, due to its higher tension-to-weight ratio and, thus, much flatter sag. This condition is most likely to occur in hilly terrain at the towers in the low points of the pull. Hold-down blocks or uplift rollers should be used in these cases. Since the uplift condition will normally stop when the conductor(s) arrive, hold-down blocks that can be removed before the arrival of the conductor(s) without stopping the pulling should be used. Uplift devices that attach to bundle travelers are usually directional and are usually positioned toward the pulling end. These devices should have a breakaway feature in the event of fouling of the pulling line or incorrect installation.

Where travelers are installed to string through dead-end towers, the travelers are normally connected directly to the tower. If line angles of more than 20^{o} are involved, then two travelers in tandem may be required to reduce the bending radius of the conductor or the load on each traveler, or both. Where bundled conductor travelers are used at line angle locations of over 5^{o}, it is advisable to change to individual single conductor travelers after the passage of the running board to facilitate accurate sagging.

Stringing of conductors and temporary guying of conductors shall be done by methods that will prevent damage to the conductor and structures in any way. Temporary guying/dead endings to tower footings will not be permitted. Where a temporary dead end is required, the conductors shall be attached to suitable temporary anchors.

The general requirements for the installation of the temporary anchors are as follows:

The angle formed by conductors/Aluminum Clad shield wire/OPGW to the horizontal shall not exceed 15 degrees.

The anchors shall be aligned in the direction of stringing:

The anchors and their accessories shall withstand the maximum conductor tensions with a factor of safety of three.

Four sub-conductors of one phase shall be strung simultaneously using a running board attached to a single pulling line with a swivel. Sub-conductors shall be connected to the running boards with a swivel connection and a stocking-type grip. The grips shall be secured to the conductor using a band installed around the tail end of the grip.

Following stringing, measures shall be taken to prevent the sub-conductors of the bundle from contacting each other. Before adjusting the sag of the conductors, sub-conductor slapping may be prevented by pulling each of them

to a different sag which will separate them at least 153 mm vertically from either of the other sub-conductors at mid-span. After adjusting the sag, the following conditions will require sub-conductors tie-off: any time that sub-conductors slapping is noted, any time before spacer installation, the conductors are left unattended.

Two-reel lengths of the conductor may be pulled into the sheaves using only approved swivels and grips to make the connections between reel lengths. Double socking will be permitted, but permanent splices shall not be pulled through a sheave or bull wheel without the use of rigid steel casing/cover suitable to prevent bending of compressed splices/mid-span Joints while crossing the sheaves or bull wheels/Travelers.

All sheaves, swivels, and grips shall be inspected daily for free and easy movements and to assure that such may be safely used. Sheaves carrying pulling lines shall not be used for conductors.

The conductor shall be kept clean by removing grease, dust, or any other contamination. Cleaning shall be done immediately after the conductors leave the tensioning device. The method of cleaning shall be wiped with a clean cloth saturated with the proper cleaning agent. When it is necessary to slack the conductor at any time during the stringing operation, it shall be done with the approval of the Engineer. Rigid plank guard or lagging, or a combination of both shall be used to prevent damage. Lagging shall consist of nonmetallic material which will not damage the conductor and shall be rigid so that it will not be displaced by the motion of the conductor. It shall be free of any material, which can be transferred to the conductor.

Sections of the conductor damaged by the application of gripping attachments or any other way during stringing shall be removed before the conductor is sagged in place.

The conductor repairs shall be done as outlined in Clause 1.7(11) (b) of the Technical Provisions.

All stringing operations must be conducted so that at no time will any suspension structure be subjected to longitudinal loads and at no time will any tension structure except the dead-end structure be subjected to excessive unbalanced loads resulting from longitudinal loads on opposing faces. At no time shall any structure be subjected to torsion. The vertical angles of pulling lines shall be such as to minimize the vertical loading on towers. The attachment of temporary guys and stringing equipment on towers shall be done only with the approval of the Engineer.

The conductor and shield wire reels, tensioners, and pulling machines shall be located as near to mid-span as possible but in no case shall the slope of the OPGW or shield wire or conductor between any machine and the stringing block

or any anchor lead be steeper than three horizontals to one vertical (15°-20° to the horizontal).

The tension in the conductor during stringing shall be maintained as constant as practicable. The sag in each conductor must be maintained at least 20 percent greater than the sagging value specified in sag charts and the maximum pulling tension shall never exceed the sagging tensions.

If the conductor is left unattended, during stringing operations, it shall be freely suspended between stringing sheaves to provide a safe clear distance over ground or obstructions.

The minimum tension shall be such as to maintain the conductors at a minimum distance of 3 meters above ground or any obstacle.

When there is the possibility of the conductor being damaged due to wind or other conditions, it shall immediately be fully tensioned. It is recommended that variations in stringing tensions be as small as possible and the tension shall be near the maximum permitted. Immediately after completing the stringing of a section of the line, the tensions shall be increased to the maximum permitted stringing values.

The spinning of the conductors and shield wires shall be prevented during stringing. Unreeling of the conductors shall be closely watched at all times to detect any damage or flaw in the conductor.

(8) **Handling and Stringing of Shield wire and OPGW**

One aluminium-clad steel overhead shield wire and one OPGW shall be strung for the entire length of the line.

The specifications used for handling and stringing the OPGW & overhead shield wires shall be the same as for the conductors.

(9) **Conductor Sagging**

After being pulled into the sheaves all sub-conductors in a sag section shall be sagged within 24 hours.

The conductors shall be sagged following sag charts, furnished by the Contractor. The exact value of sag for a given span length at a given temperature can be ascertained from the appropriate table or by linear interpolation of data.

Conductor sagging temperature shall be measured by an accurate thermometer. A length of the core shall be pulled from a 0.5-meter length of the conductor sufficient for the thermometer to be inserted into the space vacated by the core.

The length of conductor shall be placed in the full sun at least 4 meters above the ground for a minimum period of 15 minutes. A thermometer in a container that stimulates the effect of the conductor may also be used.

The length of the conductor sagged in one operation shall be limited to the length that can be sagged satisfactorily, usually 2,300 meters to 4,600 meters.

Temporary snubs shall be used between a section previously sagged and clipped in and the section being sagged. Dead endings or snubbing will not be permitted on any tower except dead-end towers at the normal point of attachment.

When conductors are sagged a mark shall be placed on each conductor at the last structure in each pull. The location of this mark shall be checked after the succeeding sag has been made to ascertain whether or not the back spans are still sagged properly. The wire grips may be removed only after the next section of the line has been sagged.

When a sagging conductor has lengths of more than four spans, the sag shall be checked near each end span and at or near the middle span of the length being sagged. The length of the spans used for checking sag shall be nearly equal to the ruling span as practicable.

The sag of each span more than 600 meters in length shall be checked in addition to the above. Sag at sharp vertical angles and horizontal angles of 10 or more degrees shall also be checked on both sides of the angle.

The sags shall be determined using transit or other approved methods. At least one person shall be provided to measure the correct sag for pulls up to five spans, two persons for six to ten spans, and three persons for eleven spans or more.

The total number of spans to be checked shall be not less than two in a four-span section, three for a section up to two kilometres, and in proportion for a longer section.

In the quad conductor bundle the sag of the two upper sub-conductors shall be the same. The lower sub-conductors shall be sagged from 30 to 60 mm more than the upper sub-conductors.

A tolerance of plus or minus 10 mm of sag per 30 meters of horizontal span length, but not to exceed 150 mm in any one span, will be permitted, provided that: (1) upper sub-conductors in the span assume the same sag; (2) the necessary ground clearance is obtained; (3) the conductor tension between successive sagging operations is equalized so that the suspension insulator assemblies will assume the proper position when the conductor is clipped in; (4) the sag in the lower sub-conductor of the bundle is 30 to 60 mm more than the sag in the upper sub-conductors.

Log books shall be maintained to record all conductor installation data and chronological progress.

The temperature, spans, tower, general weather, wind velocity and direction, sags, tensions, and drawing references shall be recorded for each section of the conductor as it is being installed, tensioned, and sagged. When possible, sagging operations shall be scheduled when wind velocity is at or near zero.

Radiotelephone or mobile communication shall be used to relay information and instructions between the conductor payout station, intermediate checkpoints, mobile stations and the pulling stations at all times during stringing operations. A failure of communication requires immediate cessation of the conductor pulling operation.

(10) **Conductor Clipping-in**

After being sagged, the conductor shall be allowed to hang in the stringing blocks for not less than 2 hours before clipping-in is commenced, to permit the conductor tension to equalize.

Plumb marks shall be made on the conductors in the vertical plane through the centerline of the tower before clipping in. Only paint, crayon, or wax pencil shall be used for marks on conductors.

All conductors marking in the section being sagged shall be accomplished while the conductors are in the sheaves and before clipping-in or dead-ending is begun.

The total time during which the conductor is allowed to remain in the stringing blocks before being clipped in shall not exceed 72 hours.

Torque wrenches shall be used to tighten all nuts on clamps. The torque applied shall be in conformance with the recommendation of the Contractor.

Yoke plates for V- V-string insulators shall be installed as shown on the drawings and shall hang at 90 degrees to the conductor axis within a tolerance of plus or minus 2.5 cm.

Well-padded pull-lift hooks or other approved methods shall be used for handling conductors during the clipping-in operation.

(11) **Installation of Conductor, Shield wire and OPGW Accessories**

(a) **Splices and Dead Ends**

All splices shall be of the compression type.

All splices shall be made at least 15 meters away from structures and no splices shall be made in dead-end spans or spans greater than 600 meters or spans crossing over the highways, railroads, major canals, rivers, and transmission lines of voltages greater than 33 kV unless approved by the Engineer.

As a rule, not more than one joint or splice should be made in any one conductor in any one span. However, in exceptional cases, as in the repair of damaged conductors, or when necessary, owing to stringing limitations two splices will be allowed.

The splices and compression dead ends shall be installed following the recommendations of the Contractor of the accessories.

The conductor shall be laid out straight for a distance of 15 meters and straightened at the end before preparation of the ends for splicing or dead-ending. The ends of the conductor shall be thoroughly cleaned immediately before compressing. After the compression has been completed, all corners, sharp projections, and indentations shall be carefully rounded and smoothed, and tape, tape residue, and filler paste shall be removed from the splice and conductor. If the completed splice requires straightening, it shall be straightened on a wood block by use of a wooden maul.

Splicing, dead-ending, and repair of damaged conductor shall be done in the presence of the nominated person of the Engineer.

If the completed splice or dead-end is not satisfactory, in the opinion of the Engineer or his nominated person, it shall be removed and a new splice or dead-end shall be properly installed.

The Contractor's inspector shall stamp his initials on the aluminium sleeve of each compression joint and compression dead end completed under his supervision.

(b) **Repair of Conductors and aluminium-clad shield wire**

Damage is any deformity on the surface of the conductor or aluminium-clad shield wire which can be detected by eye or by feel and shall be repaired by whichever of the following methods are appropriate:

(i) Repair by manual polishing
(ii) Installation of repair sleeves over the damaged part
(iii) Installation of compression joints
(iv) Replacement with new conductor or aluminium-clad shield wire

Slight damage such as superficial scratches or abrasions, which are not deeper than one-third of the strand diameter, can be repaired by dressing with a fine emery cloth.

Severe cuts which cannot be repaired with emery cloth due to their depth or extension, and cause an increase in the resistance of the external layers shall be repaired by use of repair sleeves, provided that not more than one-third of the outer layer is cut or damaged over a length of less than 10 centimetres.

Damages of an extent greater than described in the above paragraphs shall be repaired by replacing the damaged length of the cable using compression joints.

When there is repeated damage in the same span or consecutive spans, the Engineer or his nominated person may require all conductors in these spans to be replaced.

In the case when signs of corrosion are detected during the stringing operation, the reels containing corroded conductors shall be set aside, the operation shall be interrupted and the Engineer or his nominated person shall be informed immediately.

Whenever a repair sleeve is installed, a rope cage shall be placed on the sleeve to ensure that there will be no damage from sub-conductor slapping before the installation of the spacer dampers.

For the repair of the shield wires, only compression joints shall be used.

(c) **Jumper Connections**

Where compression-type dead-ends are used, the jumper shall be one continuous piece, and compression-type jumper terminals bolted to the compression-type dead-ends shall be used.

At overhead Aluminum Clad shield wire compression type dead-ends clamps and OPGW with thimble clevis and grip dead end, sufficient length of wire to form the jumper loop to clear the tower shall be allowed. Parallel groove bolted clamps will be used for the connection.

(12) **OPGW Jointing/Splicing and Installation of OPGW Joint Boxes**

OPGW jointing/splicing and joint box installation will be carried out by the Contractor. However, following general instructions should be followed:

No mid-span joint shall be allowed in the OPGW. All joints shall be performed in a joint box located on the tower just above the location of the anti-climbing device. OPGW jointing (splicing) and joint box installation including supporting

devices for joint boxes shall be executed by the Contractor. OPGW shall be dropped to the joint boxes along with tower braces by installing OPGW-attaching clamps at about one-meter intervals.

1.9 Installation of Dampers

(1) **Spacer Dampers**

The four sub-conductors of each phase shall be secured to each other using spacer dampers installed strictly following the data furnished.

The intervals, measured along the length of the conductors at which spacers are installed shall be as shown on the data sheets with tolerances not more than plus/minus 1.0 meter.

Spacer-dampers shall be installed in a span only after that span has been dead-ended and clipped in. The installation of spacer dampers shall be completed in each section within 72 hours after the sub-conductors have been sagged.

The clamps shall be properly aligned on the conductors. The distorted shape of the spacer dampers will be considered an unsatisfactory installation and shall be corrected or the spacer damper replaced.

The bolts of the breakaway type shall be tightened until the outer head breaks off.

Spacer dampers shall be installed with the bolt heads in a downward position for viewing from the ground.

(2) **Spacer**

The four sub-conductors of each jumper phase shall be secured to each other using a spacer installed strictly following the data furnished.

Two (02) nos. of Spacers will be installed between the yoke plate of the jumper assembly and the dead-end joint of tension assembly of either side and a total of four (04) in one complete jumper length.

The bolts of the breakaway type shall be tightened until the outer head breaks off.

(3) **Vibration Dampers**

Vibration dampers shall be attached to the overhead shield wires and OPGW at the ends of all spans and as designated on the data sheets. The vibration dampers shall be fastened securely to overhead shield wires & OPGW so that they will hang in vertical planes. The spacing of dampers shall be following the Drawings. Breakaway-type bolts shall be tightened until the outer head breaks off.

2 PRE-COMMISSIONING AND COMMISSIONING TESTS

2.1 Pre-Commissioning Tests

a) Mechanical Tests

1. For steel structures, ensure that the structure type is as per the specifications/drawings/structure list.

2. Check galvanizing and thickness (rust is not acceptable).

3. Check bolt types and tightness (torque wrench method).

4. Ensure anti-climbing guards are correctly installed.

5. Check step bolt tightness.

6. For glass insulators, check insulators for chips, cracks, etc. Ensure the correct number of insulators have been installed in each string. Ensure that cotter keys have been properly installed.

7. Make sure that insulators are clean and the line is safe to be energized.

8. Check that all line hardware and fittings (insulators, corona rings, vibration dampers, spacer dampers, conductor clamps, armour rods, etc.) are installed correctly and in the correct locations as per specifications and drawings.

9. Check that all splices are correct and installed in the correct span locations.

10. Check that all jumpers are installed correctly. Ensure correct clearances between jumper and structure as well as with other phases at acute angle locations.

11. Ensure there is no twist in the insulator string.

12. Check that the overhead shield wire and OPGW are grounded at each tower location as specified.

13. Ensure that sags for phase and overhead ground conductors are even and according to the specifications.

14. Check that ground clearances are as per specification.

15. Check circuit/phase identification plates, structure number plates, danger sign plates, etc. have been correctly installed at each structure and aerial markers at the required structures.

16. Check line/phase is correctly transposed at the specified locations and that clearance between the phases is as per specification.

b) <u>Electrical Tests</u>

1. Check tower footing resistance as per specification.

2. Verification of physical phase arrangement.

3. Perform sequence impedance test (both zero and positive sequence).

4. Perform continuity and insulation tests of complete transmission lines with appropriate test equipment.

5. Tests on OPGW:
    - OTDR test of each fiber
    - Attenuation test
    - Continuity test

11.2 Commissioning Tests

1. Perform phase sequence/rotation check.

2. Inspection of Facilities for any visual/audible abnormality.

Sample

MONTHLY PROGRESS REPORT

June 2024

1. Project Key Data

FORMAL PROJECT NAME	
PROJECT SUMMARY	
CONTRACT SCOPE	
CONTRACT TYPE	
EXICUTING AGENCY	
MAIN CONTRACTOR / SUPPLIER	
PROJECT MANAGEMENT COMPANY	
CONTRACT AMOUNT	
COMPLETION DATE	
CONTRACT SIGNING DATE	
COMMENCEMENT DATE	

2. Executive Summary

4. Contract Start-up Activities and Submittals

4.2 Residual Tender Stage Actions

Clause (*)	Description	Responsible Party	Planned Date	Actual Date	Comments
ITB 42.1	Issuance of Letter of Acceptance (LoA)				
ITB 19.6	Return Bid Security to Contractor				
ITB 43.2	Contract Agreement Signature				

4.3 Contract Requirements

Clause (*)	Description	Responsible Party	Planned Date	Actual Date	Comments
GCC 4.2	Provision of Performance Security				

4.4 Contract Activities Required Within 30 Days of Commencement Date

Clause (*)	Description	Responsible Party	Planned Date	Actual Date	Comments

5. Risk Management

Ref	Description	Impact Rating	Likelihood Rating	Risk Level	Mitigation Measure	Responsible Party	Comments

6. Project Monitoring

6.1 Project status as of September 27, 2023:

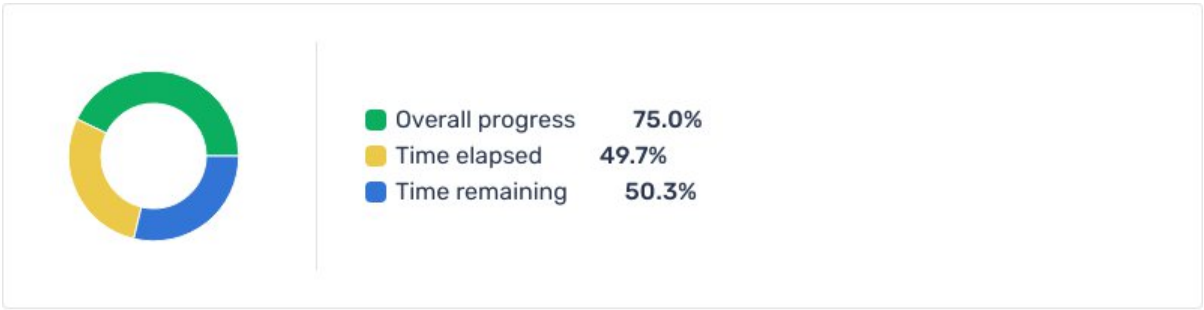
Project Status as of Date	
Commencement Date	
Completion Date	
Time Elapsed	
Planned Progress	
Actual Progress	
Expected Completion Date	
Variance to Completion	

6.2 Level 2 Program

Ref	Description	Original Program Milestone	Updated Completion Date	Variance
1				
2				
3				

6.3 Program Progress

6.4 Program Overview



Critical Path Forward

6.5 One Month Look Ahead

Target Description	Planned Date	Completion Date	Completed

7. Variations and Claims

7.1 Summary

Total Estimated Variations Cost	
Total Approved Variations Cost	
Total Variations Pending Approval Cost	
Total Claims Submitted Amount	
Total Claims Certified Amount	
Total Claims Pending Certification Amount	
Total Estimated Contract Cost Changes	
Total Approved Contract Cost Changes	
Total Pending Contract Cost Changes	
Prior Contract Price	
Estimated Revised Contract Cost	
Approved Revised Contract Cost	

7.2 Variation Register

Ref	Variation Description	Date Instruction Issued	Estimated Variation Cost	Approved Variance Cost	Current Status
1					
2					

7.3 Claim Register

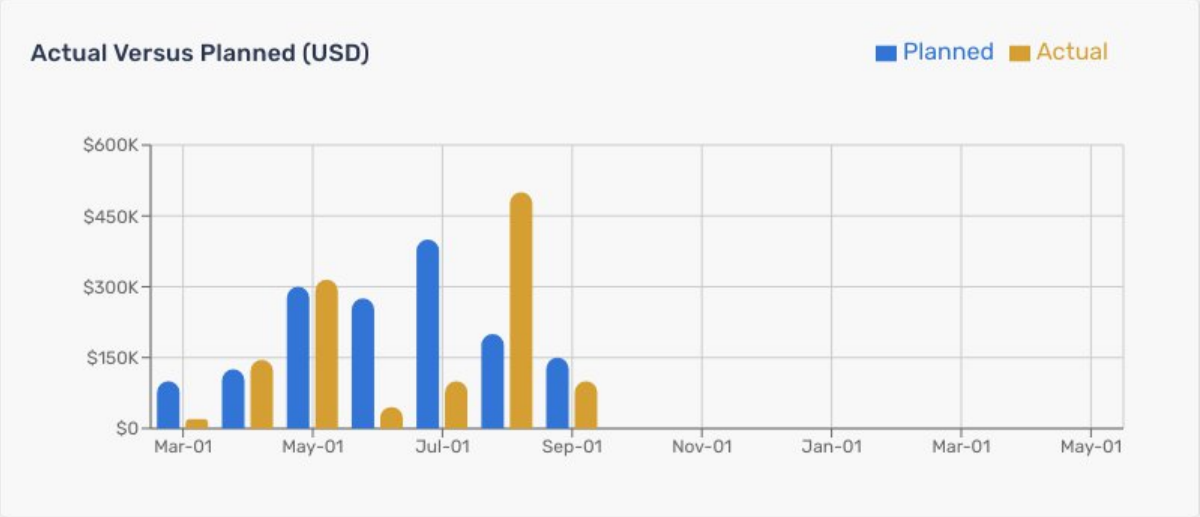
Ref	Description	Submission of Notice of Claim	Submission of Fully Detailed Claim	Claimed Amount	Amount Certified	Current Status
1						

8. Financial Management

8.1 Actual Project Payments

Description	Date	Cost
Total		**1,225,000**

8.2 Actual Versus Planned Project Payments



9. Disputes

Dispute Description	Dispute Status

10. Goods / Equipment

10.1 Goods / Equipment Packages Status

Description	FAT Status	Custom Clearance Status	Planned Delivery Date	Actual Delivery Date	Cost	Invoiced

11. Engineering / Design Documents

11.1 Engineering

Description	Percentage Complete	Name of Approver	Approval Stage	Design Document Cost	Invoiced

12. Environment, Social Health & Safety, and Security Related Obligations

12.6 Complaints (Grievances)

Name of Complainant	Complaint Description	Date Filed	Effected Person(s)	Responsible Party	Complaint Status

13. Site Photographs

14. Completion of Work and Contract Closure Activities

Completion Activity Description	Planned Date	Achieved Date	Activity Completed

15. Contract Details

15.1 Contract Details & Key Dates

Contract Title	
Contract Number	
Contract Type	
Contract Scope	
Location	
Original Contract Amount	
Date of Issuance of Letter of Acceptance	
Contract Signing Date	
Contract Commencement Date	
Contract Effective Date	
Contract Project Start Date	
Contract Time for Completion (days)	
Original Contract Completion Date	
Financer	
Executing Agency	
Contractor / Supplier	
Design Consultant (if applicable)	
Project Manager	
Defects Liability Period / warranty	
ADB Loan Effectiveness Date	
ADB Loan Closing Date	

16. Communications and Reporting

16.1 Contact Details

Ref	Entity	Name	Title	Position	Phone	Email
Executing Agency		oro				
Implementing Agency						
Contractor / Supplier						
Engineer / PMC						
Financer						
Dispute Board Members						
Other						

ANNEXURE – A

NTDC REVISED SOP FOR BLACKLISTING

NATIONAL TRANSMISSION AND DESPATCH COMPANY LIMITED (NTDC)

REVISED SOP FOR BLACKLISTING

(As on 25.02.2019)

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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.

FRAUD AND CORRUPTION

1- FRAUD AND CORRUPTION

1.1 NTDC requires Bidders, Suppliers, and Contractors to observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, NTDC (a) defines, for the purposes of this provision, the terms set forth below as follows:

(i) "corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;

(ii) "fraudulent practice" means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;

(iii) "coercive practice" means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

(iv) "collusive practice" means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party;

(v) "abuse" means theft, waste, or improper use of assets related to NTDC-related activity, either committed intentionally or through reckless disregard;

(vi) "conflict of interest" means any situation in which a party has interests that could improperly influence that party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations;

(vii) "obstructive practice" means (a) deliberately destroying, falsifying, altering, or concealing of evidence material to an NTDC investigation, or deliberately making false statements to investigators, with the intent to impede an NTDC investigation; (b) threatening, harassing, or intimidating any party to prevent it from disclosing its knowledge of matters relevant to a NTDC investigation or from pursuing the investigation; or (c) deliberate acts intended to impede the exercise of NTDC's contractual rights of audit or inspection or access to information; and

1.2 NTDC will reject a proposal for award if it determines that the Bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the Contract;

1.3 All Bidders, consultants, contractors, suppliers and other third parties engaged or involved in NTDC-related activities have a duty to cooperate fully in any screening or investigation when requested by NTDC to do so. Such cooperation includes, but is not limited to, the following:

(a) being available to be interviewed and replying fully and truthfully to all questions asked;

(b) providing NTDC with any items requested that are within the party's control including, but not limited to, documents and other physical objects;

(c) upon written request by NTDC, authorizing other related entities to release directly to NTDC such information that is specifically and materially related, directly or indirectly, to the said entities or issues which are the subject of the investigation;

(d) cooperating with all reasonable requests to search or physically inspect their person and/or work areas, including files, electronic databases, and personal property used on NTDC activities, or that utilizes NTDC's Information and Communications Technology (ICT) resources or systems (including mobile phones, personal electronic devices, and electronic storage devices such as external disk drives);

(e) cooperating in any testing requested by NTDC, including but not limited to, fingerprint identification, handwriting analysis, and physical examination and analysis; and

(f) preserving and protecting confidentiality of all information discussed with, and as required by, NTDC.

1.4 All Bidders, consultants, contractors and suppliers shall ensure that, in its contract with its sub-consultants, Subcontractors and other third parties engaged or involved in NTDC-related activities, such subconsultants, Subcontractors and other third parties similarly undertake the foregoing duty to cooperate fully in any screening or investigation when requested by NTDC to do so.

1.5 The Purchaser hereby puts the Bidder on notice that the Bidder or any joint venture partner of the Bidder (if any) may not be able to receive any payments under the Contract if the Bidder or any of its joint venture partners, as appropriate, is, or is owned (in whole or in part) by a person or entity subject to applicable sanctions.

ANNEXURE – B

REVISED SOP FOR EXTENSION OF TIME

NATIONAL TRANSMISSION & DESPATCH CO. LTD.

DEPUTY MANAGING DIRECTOR
(ASSET DEVELOPMENT & MANAGEMENT)

No.DMD(AD&M)/NTDC/Admn/ 2133-41 **Dated:** 02 **January, 2023**

- **GM (PD/GSC) North NTDC, Lahore**
- **GM (AM/GSO) North NTDC, Lahore**
- **GM (PD/GSC) South NTDC, Hyderabad**
- **GM (AM/GSO) South NTDC, Hyderabad**
- **GM (P&CM) NTDC, Lahore**
- **GM (HVDC) NTDC, Lahore**
- **DG (Land) NTDC, Lahore**
- **CE (PMU) NTDC, Lahore**
- **CE (Civil) NTDC, Lahore**

Subject: - **APPROVAL OF STANDING OPERATION PROCEDURE (SOP) FOR EXTENSION OF TIME CASES.**

Please enclosed find herewith a copy of Company Secretary NTDC's Notification No.NTDC/CS/2120-25 dated 18.11.2022 for compliance, please.

DA:- **As above.**

(Engr. Manzoor Ahmad)
Dy. MD (AD&M) NTDC

c.c

- Master file.

NATIONAL TRANSMISSION & DESPATCH CO. LTD

Company Secretary

No. NTDC/CS/2/20-25 Dated: 18 – 11 – 2022

NOTIFICATION

Approval of revised Standard Operating Procedure (SOP) for Extension of Time Cases.

The Board of Directors of National Transmission & Despatch Company Limited (NTDC) in its 235th meeting held on 17.11.2022 against agenda item No. 06 has unanimously resolved and approved the revised SoP for Extension of Time cases.

Azhar Saleem
Company Secretary

Copy to:

1. Managing Director
2. Dy. Managing Directors (AD&M, P&E & (SO))
3. Chief Financial Officer
4. Chief Engineer (MP&M)

REVISED SOP FOR EXTENSION OF TIME

October, 2022

REVISED SOP FOR PROCESSING OF EXTENSION OF TIME (EOT) CASES IN NTDC CONTRACTS (2022)

1. PREFACE

1.1 NTDC is dealing with multiple contracts. Claims of EOT from the contractors / consultants are quite common. The existing SoP does not address the issue and also in conflict with different contract provisions. Resultantly, the cases are piled up for years making it stagnant to close the contracts/ projects.

1.2 Guidelines mentioned in this SoP shall be followed to deal with claims of the contractors / consultants.

1.3 This SOP shall supersede the existing SoP issued vide Company Secretary NTDC Notification No. C.S./NTDC/1279-83 dated 13-10-2010 approved by Board of Directors of NTDCL in its 50th meeting held on 30-09-2010 for handling the cases for extension of time for contractors/supplier.

1.4 Wherever any provision of this SOP shall be in conflict with provisions of any applicable guidelines of International Financial Institutions (IFIs), or any other applicable Statute / Law or Rule, the provisions of such applicable guidelines, laws or rules shall prevail.

1.5 This SOP shall become a part of the future Bidding Documents or its provisions may be incorporated in the Bidding Documents.

1.6 The procedures in this SoP are categorized for different types of Contracts i.e., Supply Contracts, Construction/EPC Contracts and Consultancy Services.

1.7 This SoP does not in any way impact the rights/obligations of the parties defined in the contract agreements unless amended with mutual consent of the parties. Accordingly, the contract provisions dealing with the claims management will hold prevalence over this SoP in case of any contradictions.

1.8 The glossary of terms is attached as Annexure-A for reference: -

A) FOR SUPPLY CONTRACTS

1. In case of an event due to any act of prevention by the Purchaser or any other causes specified in the Contract, the Contractor shall submit a Notice describing the complete details of such act alongwith documentary evidence and reference to the provisions of the Contract Documents. Such

Notice shall be submitted within 28 days or any other time agreed between the parties, of occurrence of each event.

2. The final request for Extension of Time (EOT) with detailed particulars will be submitted by the Contractor within 42 days from the date of delayed event attributable to the Purchaser as per Contract, afterwards, the case will be considered as barred by time. Only those reasons of delay will be considered for which timely Notice was served by the Contractor.

3. The request of the supplier / Contractor for EOT shall be forwarded to Design Engineer, CFO NTDC and/or any other concerned formation, by the Purchaser for their comments / recommendations within 07 days from receipt of the claim by the supplier. The formations shall finalize their comments within 21 days of receipt of such request.

4. Afterwards, the Purchaser shall prepare a consolidated case along with detailed assessment of the view taken by stakeholders and its recommendations within 21 days and put up the same for approval of the Competent Authority of Procuring Agency in line with powers identified in Table-1.

5. The Competent Authority of Procuring Agency so defined by the Table No. 01 will decide the case within 07 days of its submission.

6. In case MD (NTDC) is the competent authority, case will be referred to Scrutiny Committee within 7 days of receipt of the case / recommendations from the Purchaser which shall be decided by the Committee within 21 days and will be approved by MD (NTDC) within 07 days of the receipt of report by the Committee.

7. If the Purchaser does not conclude the case within 3 months from the date of receipt of Claim from the Supplier or as otherwise agreed between the parties, the claim of the Supplier shall be deemed as approved

Table 1: Powers to grant EoT in Supply (Material Procurement) Contracts

Extension of Time (EOT) under Supply Contracts (Awarded by BOD)			
Sr. No.	**Nature of Power**	**Competent authority**	**Days**
(i)	In case, the EoT does not involve any additional cost except non-recovery of Liquidated Damages.	Managing Director	Full Power
(ii)		Dy. Managing Director	Equal to scheduled delivery period mentioned in the Contract upto maximum of 365 days for each Contract.
(iii)		General Manager or equivalent	Equal to 1/2 of scheduled delivery period mentioned in the Contract upto maximum of 90 days for each Contract.

(iv)		Chief Engineer or equivalent	Equal to 1/4 of scheduled delivery period mentioned in the Contract upto maximum of 45 days for each Contract.
(v)	In case of EoT involves additional cost	Managing Director	EOT upto limits specified above and additional cost of up to 15% of Contract Price.
		Board of Directors	In all other cases.

Grant of Extension of Time (EOT) beyond scheduled completion of contracts (In case of Contract is not awarded by BOD)			
Sr. No.	**Nature of Power**	**Competent authority**	**Days**
(i)	In case of EOT does not involve any additional cost except non recovery of liquidated damages	The same officers who sanctioned the tender for award of contract.	Full Powers
(ii)	In case of EOT involves additional cost	Managing Director	Upto 15% of original Contract price

Note: - Same procedure as delineated above shall be applicable in case of multiple claims for EOT, however, competency shall be determined on aggregate basis.

B) FOR CONSTRUCTION / EPC CONTRACTS

1. The Contractor shall give a Notice to the Engineer with a copy to the Employer, describing the event or circumstance (specified in the contract as Employer's risk or exceptional event or otherwise defined) giving rise to the delay for which the Claim is made as soon as practicable, and no later than 28 days after the Contractor became aware, or should have become aware, of the event or circumstance.

2. If the Contractor fails to give a Notice of Claim within this period of 28 days, the Contractor shall not be entitled to any EoT, and the Employer shall be discharged from any liability in connection with the event or circumstance giving rise to the Claim.

3. Within either: (i) 84 days after the Contractor became aware, or should have become aware, of the event or circumstance giving rise to the Claim, or (ii) such other period (if any) as may be proposed by the Contractor and agreed by the Engineer the Contractor shall submit to the Engineer a fully detailed Claim.

4. If within this time limit the Contractor fails to submit the detailed statement, the Notice of Claim shall be deemed to have lapsed, it shall no longer be considered as a valid Notice.

5. If the event or circumstance giving rise to a Claim has a continuing effect: (a) the fully detailed Claim submitted shall be considered as interim; (b) in respect of this first interim fully detailed Claim, the Engineer shall give his/her response on the contractual or other legal basis of the Claim, by giving a Notice to the Contractor within the time limit described below; (c) after submitting the first interim fully detailed Claim the Contractor shall submit further interim fully detailed Claims at monthly intervals, giving the accumulated extension of time claimed; and (d) the Contractor shall submit a final fully detailed Claim with a copy to the Employer within 28 days after the end of the effects resulting from the event or circumstance, or within such other period as may be proposed by the Contractor and agreed by the Engineer.

6. This final fully detailed Claim shall give the total amount extension of time claimed.

7. When determining each EOT, the Engineer shall review previous determinations and may increase, but shall not decrease, the total EOT.

8. If a delay caused by a matter which is the Employer's responsibility is concurrent with delay caused by a matter which is the Contractor's responsibility, the Contractor's entitlement to EOT shall be assessed in accordance with the rules and procedures stated in the Special Provisions (if not stated, as appropriate taking due regard of all relevant circumstances).

9. The Engineer shall give the Notice of his/her determination within 90 days or within such other time limit as may be proposed by the Engineer and agreed by both Parties. While reaching at fair determination, the Engineer may seek the comments of Design office, CFO, Supervision Consultant or the Employer about the relevant events related to their offices.

10. The Engineer shall seek comments from the relevant offices, if required, within 7 days of receipt of Claim of the contractor. The concerned formations will reply within 21 days of receipt of request from the Engineer. The Engineer shall make its determination and seek consent of the Employer if required within 21 days. Accordingly, approval of the competent authority as mentioned in Table-2 below/ notification of determination shall be made within 7 days with a copy to MD (NTDC).

11. Cases falling under competency of MD (NTDC) and BoD (NTDC) shall be forwarded by the Engineer for approval of MD (NTDC) which shall be referred to Scrutiny Committee within 7 days of its receipt. The Committee shall decide within 21 days and will be approved by MD (NTDC) within 07 days of the receipt of report by the Committee.

12. If case is not approved / rejected within above said time or as otherwise specified / agreed between the parties, the claim of the Contractor shall be considered as deemed approved except where approval of BoD (NTDC) would be required. The case will then be decided within a reasonable time.

13. The following aspects shall be observed while making determinations of EOT:-

    a) The Contractor shall keep contemporary records as may be necessary to substantiate the Claim.

    b) Reasons for extension with proper justification, apportioning responsibility and all necessary documents should be attached with every proposal while seeking EoT.

    c) For extension due to obstruction on account of Right of Ways (ROW) and or delay in removal of encroachments, necessary justification with utilities location/extent of obstruction vis-à-vis work program of Contractor will be required. Separate information will be required for each item/company.

    d) Field formations will keep an up to date chart which must indicate that when ROW has started on any location and when it was resolved in order to avoid any confusion/conflict. Such charts must be signed by both NTDC and the Contractor's personnel.

    e) For extension against delay due to revision in scope, detailed information concerning original and revised scope will be required.

    f) Reasons for delay will also include information concerning skilled manpower, machinery & equipment, etc. deployed by the Contractor at site. In case of non-deployment of the required resources as per Contract, the Engineer / Project Manager may turn down the request of the Contractor.

    g) Engineer can allow extension of upto 60 days for each event (either interim or final), however if cumulative of such multiple events exceeds 60 days' time, then report of such approval shall

be communicated to next higher authority with proper justifications for reporting and control purposes.

h) The Engineer shall make distinction between excusable, non-excusable, critical and non-critical delays (events delaying the progress of subsequent activities). Only critical excusable delays give an entitlement to an extension of Time without imposition of Liquidated Damages.

i) The Engineer shall approve baseline schedule and shall ensure timely submission and updates of the progress schedules / program by the Contractor as per relevant provisions of the Contract.

14. After approval of extension of time in pursuance of below mentioned powers, the Engineer shall notify the extension of time (both Interim and Final) to the Contractor, Employer and other concerned offices along with reasons.

15. The Engineer shall make his determination after due consultation with the Employer and the Contractor and shall notify the Contractor of the determination, with a copy to the Employer.

16. The Engineer will maintain a log/register for EOT determinations made during currency of the Contract alongwith proper reasons/justifications dully substantiated by documentary evidence. The detail of all EoT submittals/determinations and subsequent changes to the schedule shall be made part of Project Completion report.

The followings shall be competent to grant approval of time extension cases:

Table 2: Powers to Grant Extension of Time in Civil Works/EPC/Turneky Contracts

Extension of Time (EOT) under Civil Works/EPC/Design, Supply and Installation Contracts (Contract is Awarded by BOD)			
Sr. No.	**Nature of Power**	**Competent authority**	***Days per event/cause**
(i)	Power to Grant Extension of Time and/or for interim determination of Extension of Time in cases of events **If extension of time does not involve any additional cost except non recovery of liquidated damages**	Managing Director	Upto 365 days
(ii)		Dy. Managing Director	Upto 180 days
(iii)		General Manager	Upto 120 days
(iv)		Chief Engineer/Project Engineer	Upto 60 days

(v)	In case of EoT involves additional cost except non recovery of liquidated damages and price adjustment	Managing Director	EOT upto 365 days and additional cost of up to 15% of Contract Price.
		Board of Directors	In all other cases.

Grant of Extension of Time (EOT) beyond scheduled completion of contracts (In case of Contract is not awarded by BOD)			
Sr. No.	**Nature of Power**	**Competent authority**	**Days**
(i)	In case of EOT does not involve any additional cost except non recovery of liquidated damages	The same officers who sanctioned the tender for award of contract	Full Powers
(ii)	In case of EOT involves additional cost	Managing Director	Upto 15% of original contract

Note: - Aforementioned powers can be exercised by "The Engineer", "Project Manager", "Employer" or any other person designated for the purpose in the Contract and in accordance with the procedures mentioned in the Contracts.

** The powers specified in above table can be exercised for interim as well as final determination of extension of time case. However, in case same event has continuing effect, competency will be determined on aggregate / accumulative basis.*

C) FOR CONSULTANTS

1. If the services are impeded or delayed by the Client or his Contractors so as to increase the scope, cost or duration of the Services: -

   (a) the Consultant shall inform the Client of the circumstances and probable effects;
   (b) the increase in scope and/or costs shall be regarded as Additional Services; and
   (c) the time for completion of the Services shall be increased accordingly.

2. The Consultant is bound to notify the Client of his claim giving rise to the delay for which the Claim is made as soon as practicable, and no later than 28 days after the Consultant became aware, or should have become aware, of the event or circumstance.

3. While submitting the case for EOT, Consultant is required to elaborate reasons for extension, rational and actual status of utilization of man months with proper justification, apportioning responsibility and all submit all necessary documents.

4. While determining Extension of Time for consultancy services, the client shall take into account the status of project and rational for any extensions granted to the Contractor.

5. The Client shall seek comments / recommendations from project office/ Project Manager or any other relevant office within 07 days of receipt of Claim from the Consultant. The concerned office(s) shall reply within 21 days of receipt of letter from the Client.

6. The Client shall arrange approval from the competent authority as per Table-3 below and will make its determination within 21 days from receipt of response / recommendations from the stakeholders.

7. In case MD (NTDC) or BoD (NTDC) is the competent authority, case will be referred to Scrutiny Committee within 7 days of its receipt from the Client which shall be decided by the Committee within 21 days and will be approved by MD (NTDC) within 07 days of the receipt of report by the Committee.

Table 3: Powers to Grant Extension of Time in Consultancy Contracts

Sr.#	*Nature of Power*	*Competent Authority*	*Period*
(i)	Grant of EOT in consultancy contract, **where no additional cost is involved i.e.** (Lump sum Contracts with or without price adjustment provisions).	Managing Director	Full Power.
		Dy. Managing Director	Up to a maximum of 75% of originally contract period but not exceeding 1 (One) Year
		General Manager	Up to a maximum of 50% of originally contract period but not exceeding 9 (Nine) months
(ii)	*Grant of EoT in consultancy contract **where additional cost is involved**. i.e. (Time based Contracts with or without price adjustment provisions).	Managing Director	Upto original contract period but not exceeding one year.
		Dy. Managing Director	Upto 1/2 of original contract period upto 9 (Nine) months.
		General Manager	Upto 1/4 of original contract period but not exceeding six months.

**While considering competency, the EoT claim without cost implication shall not be taken into account. GM will be competent to accord approval for any time without cost implication.*

Note: - Same procedure as delineated above shall be applicable in case of multiple claims for EOT, however, competency shall be determined on aggregate basis.

NOTES:

(i) The officer awarding EOT shall also notify its determination to the Employer, concerned General Manager, Deputy Managing Director (Asset Development & Management) and Managing Director for information. Managing Director (NTDC) may, however, refer any case to Scrutiny Committee for internal control purposes.

(ii) If total delay in completion of project with reference to scheduled completion date is worked to be more than 365 days, a consolidated case will be submitted to EOT Scrutiny Committee (which will act as NTDC's Change Control Board) for detail assessment of the delays, compiling lessons learnt (if any) and fixing responsibility.

(iii) In case of any material breach, corrupt and fraudulent practices or misrepresentation, the Contractor shall be liable for damages/penalty even if EOT is granted according to above provisions.

(iv) Each case for Extension of Time falling in the competency of MD (NTDC) / BoD (NTDC) is to be approved after vetting by the EOT Scrutiny Committee. (The members of the committee should be independent from the offices of Employer/Engineer/Project Manager and Design Engineer). Following Committee is proposed for scrutiny of cases where required: -

General Manager (Performance Assessment)	Convener
Chief Engineer (Reliability & Compliance)	Member
Chief Engineer (Contract Management)	Member
CFO or his/her authorized Representative	Member
CLO or his/her authorized Representative	Member

(MD (NTDC) may add any member or Committee may co-opt the members with the consent of MD (NTDC). Chief Engineer (EHV/Project Delivery North / South will act as co-opted members/departmental representative for technical support and assistance to the Committee).

(v) In such cases where case is deemed approval due to delay on part of the purchaser/ Employer, Scrutiny Committee and / or any other office, disciplinary action will be taken as per E&D Rules against the person responsible.

(vi) While claiming EoT by the Contractor / Consultant, comparison between planned and actual progress will be presented.

(vii) It will be binding to provide quantification against each delay by the contractor / consultant.

(viii) If Contract allows timelines regarding submission and approval of EOT cases which are different from ones mentioned herein, then the timelines given in the contract shall prevail. The Engineer/Project Manager shall ensure that the determination/response is finalized and conveyed within the timelines stated in the Contract.

(ix) Realistic schedule must be given in the bidding documents. The Program/ schedule should be approved by the Engineer / Program as baseline schedule which shall become reference document for determination of EoT claims. The Contractor shall at all times made his reasonable efforts to minimize the delay in performance of his obligations under the Contract.

(x) If NTDC has to provide material from their own stores, then the timelines for supply of material should be mentioned so that bidder / contractor considers the same while preparing their construction schedule.

(xi) The Engineer shall keep the Employer informed about status of submission of EOT requests by the Contractor and its determination thereof to avoid unwarranted imposition of Liquidated Damages to the Contractor.

(xii) The Liquidated Damages once deducted shall not be reimbursed without approval of Managing Director (NTDC) and approval of EOT.

(xiii) If any case of Supplier / Contractor / Consultants shall be pending before the Employer / Engineer/ Project Manager for determination, Liquidated Damages shall not be deducted till its determination. Engineer/ Project Manager shall keep the Employer informed about such cases.

(xiv) The Supplier / Contractor shall not stop the delivery of the material and / or suspend / slow the progress at site as the case may be, merely based on their pending Claim for determination. In such cases, delay shall be attributable towards their account. (Similarly, the Consultants shall not suspend their work based on aforementioned grounds).

(xv) Regular reporting of the projects shall be made to the BoD (NTDC) either through Dashboard and / or any other format desired by the BoD (NTDC).

(xvi) Monthly progress review meetings shall be conducted by DMD (AD&M) with concerned formations, where, status of cases for pending EoT claims as well as new schedules (in case of EoT granted to the contractors) shall also be discussed along with remedial and risk mitigation measures.

(xvii) This SoP shall be subject to review by the management after one year and any changes made in the SoP shall be conveyed to BoD (NTDC).

Annexure-A

i. **"Procuring Agency"** stands for "National Transmission and Despatch Company (NTDC) Ltd."

ii. **"Project Authority/ Engineer / Project Manager"** Any office or Consultant representing the Procuring Agency for onsite execution works and project management in role of "Engineer", "Project Manager" or "Employer's representative etc. defined in the contract.

iii. **"Purchaser/Employer/Client"** The office representing the "Procuring Agency" in executing the procurements and signing of Contract Agreements.

iv. **"Design Engineer"** The NTDC office or independent consultant responsible for design support to the project authority in respect of reviews/approvals/release of drawings etc.

v. **"Project Supervision Consultant"** Any independent consultant hired to augment the capacity of NTDC's project authority for supervision, reporting, review and evaluation of project's activities.

vi. **"Contemporary records"** means records that are prepared or generated at the same time, or immediately after, the event or circumstance giving rise to the Claim.

vii. **"Day"** means a calendar day

viii. **"Month"** is a calendar month (as per Georgian calendar)

ANNEXURE – B

HEALTH, SAFETY AND ENVIRONMENT (HSE) AND ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN (EMMP) PROVISIONS

500 KV DOUBLE CIRCUIT TRANSMISSION LINE FROM SANGAL TO 500 KV MAIRA SWITCHING STATION

HEALTH, SAFETY AND ENVIRONMENT (HSE) AND ENVIRONMENTAL MANAGEMENT PLAN (EMP) PROVISIONS

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Appendix B: Hazard Warning Signs/Marking

List of Abbreviations

BOQ	Bill of Quantities
CBOs	Community Based Organizations
CoI	Corridor of Impact
CPPA	Central Power Purchasing Agency
CRR	Change Record Register
DISCOs	Distribution Companies
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
FMC	Facility Management Consultant
GoP	Government of Pakistan
HIV/ AIDS	Human Immunodeficiency Virus Infection and Acquired Immune Deficiency Syndrome
HSE	Health, Safety and Environment
IEE	Initial Environmental Examination
IFC	International Finance Cooperation
KP	Khyber Pakhtunkhwa
LAC	Land Acquisition Collector
LARP	Land Acquisition and Resettlement Plan
MMM	Environmental Mitigation & Management Matrix
MSDS	Material Safety Data Sheet
NDMA	National Disaster Management Authority
NEPRA	National Electric Power Regularity Authority
NEQS	National Environmental Quality Standards
NGO	Non-Governmental Organizations (NGO's)
NOC	No Objection Certificate
NTDC	National Transmission and Despatch Company
OMS	Operating Management System
OSHA	Occupational Safety and Health Administration
PAP	Project Affected Person
PD	Project Director
PMC	Project Management Consultant
PPE	Personal Protective Equipment
PR	Performance Review
QER	Quarterly Environmental Report
SDOs	Sub-Divisional Officers
SE	Superintending Engineer
SOP	Standard Operating Procedure
SPS	Safeguard Policy Statement
STD	Sexually Transmitted Diseases
T/L	Transmission Line
TMF	Traffic Management Framework

HEALTH, SAFETY AND ENVIRONMENT (HSE) PROVISIONS

1.1 HSE Provisions for Contractors

1.1.1 General Requirements

Contractor should places prime importance on health, safety, and environmental issues and requires that Contractor and its Subcontractors' subscribe to and actively pursue the highest standards of HSE performance.

Contractor should perform the Work in full compliance with the provisions, which is relevant for the Work, for the duration of the work.

Contractor should implement HSE routines, which will ensure that all Personnel are fully aware of the existence, content and expectations of the HSE.

Contractor will be responsible for ensuring that all Personnel understand and operate in accordance with the principles and requirements of HSE provisions.

Contractor shall ensure each work group has at least one (01) Person present at all times who is fluent in both the primary language of the Worksite and the language of the workers.

1.1.2 Management System

Contractor shall have in place HSE policy including assurance framework. The policy shall pay due regard to the accountability of individuals, incident reporting, safety meetings and training. Contractor shall also have established arrangements for monitoring this policy.

Contractor shall have in place a formal management system that demonstrates commitment to continuous improvement and excellence in HSE issues and which follows the HSE applicable Regulations.

Contractor shall review its management system at least annually and update it as necessary.

Certain activities pose a higher risk to the safety of personnel, property and the environment. Higher risk activities will accordingly demand a higher level of HSE commitment from Contractor's management. Where the use of a Subcontractor involves the importation of higher risk activity, Contractor must be able to demonstrate appropriate higher level of HSE commitment.

Risk can vary from location to location and, where the Work is being performed at more than one location, Contractor shall observe and comply with all relevant and current Proponent directives. Contractor may be required to provide different levels of HSE management system.

1.1.3 Compliance

Proponent standards and expectations on HSE matters shall be rewarded including proponents':

- Code of Conduct; and
- Operating Management System (OMS).

1.1.4 Competence Assurance

Contractor must be able to demonstrate competence assurance of Personnel, the scope of which will cover as a minimum training within relevant Company HSE directives including, without limitation, safe working practices, permit-to-work systems and risk assessment including risk to the environment.

Proponent has the right to remove from the performance of the Work, any Personnel who do not fulfil expected HSE performance, which, in the opinion of Company, misconduct themselves or are

incompetent or negligent in the proper performance of their duties and such Personnel shall not be again employed upon the Work without Company's Approval.

1.1.5 Reporting

Unless otherwise agreed, Contractor shall submit a formal report quarterly and present in the Performance Review (PR) for the Work, Contactor's and Sub-contractor HSE performance in the preceding reporting period and accumulated year to date. Following are the metrics for HSE performance progress reports and regular reporting.

a) Environmental incidents or non-compliances with contract requirements, including contamination, pollution or damage to ground or water supplies;
b) Health and safety incidents, accidents, injuries and all fatalities that require treatment;
c) Interactions with regulators: identify agency, dates, subjects, outcomes (report the negative if none);

Status of all permits and agreements:

- Work permits: number required, number received, actions taken for those not received; and
- Status of permits and consents:
    - List areas/facilities with permits required, dates of application, dates issued (actions to follow up if not issued), dates submitted to resident engineer (or equivalent), status of area (waiting for permits, working, abandoned without reclamation, decommissioning plan being implemented, etc.);
    - List areas with landowner agreements required (borrow and spoil areas, camp sites), dates of agreements, dates submitted to resident engineer (or equivalent);
    - Identify major activities undertaken in each area this month and highlights of environmental and social protection (land clearing, boundary marking, topsoil salvage, traffic management, decommissioning planning, decommissioning implementation); and
    - For quarries: status of relocation and compensation (completed, or details of monthly activities and current status).

d) Health and safety supervision:
    - Safety officer: number days worked, number of full inspections & partial inspections, reports to construction/project management; and
    - Number of workers, work hours, metric of Personal Protection Equipment (PPE) use (percentage of workers with full PPE, partial, etc.), worker violations observed (by type of violation, PPE or otherwise), warnings given, repeat warnings given, follow-up actions taken (if any);
e) Worker accommodations:
    - Number of expats housed in accommodations, number of locals;
    - Date of last inspection, and highlights of inspection including status of accommodations' compliance with national and local law and good practice, including sanitation, space, etc.; and
    - Actions taken to recommend/require improved conditions, or to improve conditions.
f) HIV/AIDS: provider of health services, information and/or training, location of clinic, number of non-safety disease or illness treatments and diagnoses (no names to be provided);
g) Gender (for expats and locals separately): number of female workers, percentage of workforce, gender issues raised and dealt with (cross-reference grievances or other sections as needed);
h) Training:

- Number of new workers, number receiving induction training, dates of induction training;
- Number and dates of toolbox talks, number of workers receiving Occupational Health and Safety (OHS), environmental and social training; and
- Number and dates of Human Immunodeficiency Virus Infection and Acquired Immune Deficiency Syndrome HIV/AIDS sensitization training, no. Workers receiving training (this month and in the past); same questions for gender sensitization, flag lady/flag man training.

i) Environmental and social supervision:
   - Environmentalist: days worked, areas inspected and numbers of inspections of each (road section, work camp, accommodations, quarries, borrow areas, spoil areas, swamps, forest crossings, etc.), highlights of activities/findings (including violations of environmental and/or social best practices, actions taken), reports to environmental specialist/construction/site management; and
   - Sociologist: days worked, number of partial and full site inspections (by area: road section, work camp, accommodations, quarries, borrow areas, spoil areas, clinic, HIV/AIDS center, community centers, etc.), highlights of activities (including violations of environmental and/or social requirements observed, actions taken), number of people met, highlights of activities (issues raised, etc.), reports to social specialist/construction/site management;

j) Grievances: list this month's and unresolved past grievances by date received, complainant, how received, to whom referred to for action, resolution and date (if completed), data resolution reported to complainant, any required follow-up(cross-reference other sections as needed):
   - Worker grievances; and
   - Community grievances.

k) Traffic and vehicles/equipment:
   - Traffic accidents involving project vehicles & equipment: provide date, location, damage, cause, follow-up;
   - Accidents involving non-project vehicles or property (also reported under immediate metrics): provide date, location, damage, cause, follow-up; and
   - Overall condition of vehicles/equipment (subjective judgment by environmentalist); non-routine repairs and maintenance needed to improve safety and/or environmental performance (to control smoke, etc.).

l) Environmental mitigations and issues (what has been done):
   - Dust: number of working bowsers, number of watering/day, number of complaints, warnings given by environmentalist, actions taken to resolve; highlights of quarry dust control (covers, sprays, operational status); % of rock/muram/spoil lorries with covers, actions taken for uncovered vehicles;
   - Erosion control: controls implemented by location, status of water crossings, environmentalist inspections and results, actions taken to resolve issues, emergency repairs needed to control erosion/sedimentation;
   - Quarries, borrow areas, spoil areas, asphalt plants, batch plants: identify major activities undertaken this month at each, and highlights of environmental and social protection: land clearing, boundary marking, topsoil salvage, traffic management, decommissioning planning, decommissioning implementation;
   - Spill clean-ups, if any: material spilled, location, amount, actions taken, material disposal (report all spills that result in water or soil contamination;
   - Waste management: types and quantities generated and managed, including amount taken offsite (and by whom) or reused/recycled/disposed on-site;

- Details of tree plantings and other mitigations required undertaken this month; and
- Details of water and swamp protection mitigations required undertaken this month.

m) Compliance:
   - Compliance status for conditions of all relevant consents/permits, for the Work, including quarries, etc.): statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance;
   - Compliance status of EMP and NOC requirements: statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance

Other unresolved issues from previous months related to environmental and social: continued violations, continued failure of equipment, continued lack of vehicle covers, spills not dealt with, continued compensation or blasting issues, etc. Cross-reference other sections as needed.

1.2 Right of Audit

Proponent reserves the right to audit Contractor (s) to assure itself that HSE matters and Management Systems are being managed and controlled in accordance with the declared requirements of these HSE provisions and Contractor (s) Management System.

Contractor (s) should allow Proponent auditors for full access to the Work in progress, Personnel, records and documentation for the purpose of conducting audits.

HSE inspections may be undertaken by Proponent on Contractor's systems, as and when deemed necessary by Proponent, and may be carried out without any prior notice to Contractor (s).

1.3 Contractor HSE Criteria

Tenderers shall complete the tenderer HSE management system questionnaires (refer to "Annex A") and incorporate the compete questionnaires with their tender submission. Tenderers who do not complete the questionnaire shall be ineligible for selection. Tenderers will be required to verify their responses noted in the questionnaire by providing their evidence for their ability and capacity in relevant matters. By submission of the tender and questionnaires the tenderer acknowledges and confirms as accurate all details contained in the questionnaire and any verifying documents. The Contractor HSE Criteria shall comply with the following sections:

1.3.1 Engineering and Design

- Contractor shall have a system to ensure that Risk, Emergency Preparedness, Environmental and Working Environment Analysis are carried out as an integrated part of the design and engineering process;
- Contractor shall ensure that design; test and acceptance criteria are defined and documented;
- Contractor shall adopt full life cycle perspective; and
- Contractor shall apply inherently safer design principles.

1.3.2 Environment

- Contractor shall have implemented EMP described in main EIA report of proposed Project through an effective Environmental Management System. If a system is not in place, a commitment to comply with the standard in the future is required; and
- Contractor shall monitor amount and type of discharges according to National Environmental Quality Standards (NEQS) and Punjab Environmental Quality Standards (PEQS) such as accidental, planned and permitted discharges.

1.3.3 Health

- Contractor shall ensure access to an Occupational Health Service for follow up of sick leave, occupational illness/injury and other focus areas within occupational health and working environment;
- 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;
- The Contractor shall conduct an HIV-AIDS and Sexually Transmitted Diseases (STD) or Sexually Transmitted Infections (STI) awareness programme via an approved service provider, and shall undertake precautionary measures to reduce the risk of the transfer of the HIV, STD/STI virus between and among the Contractor's Personnel and the local community, to promote early diagnosis and to assist affected individuals; and
- Contractor shall present periodic checks of basic medical such as hearing, eyesight etc. on all staff working under controlled environmental conditions.

1.3.4 Emergency Preparedness

Contractor shall ensure duty numbers to contact Persons are available at any time by means of a phone answering service in case of an emergency. The contractor must have in place a process to identify internal and external resources that may be required to respond to an emergency at site.

1.3.5 Chemicals (if used)

- Contractor shall submit Material Safety Data Sheets (MSDS) for all chemicals included in the Contract and or used in the Contract period. The MSDS shall be quality checked in accordance with the HSE regulations;
- If the product is evaluated not to be classified according to Health Risk Classification, the label "Not required to be classified, shall be used. The label shall be of a size and colour that is readable for the user. Reference is made to Regulation concerning labelling of hazardous chemicals;
- Contractor shall supply client with relevant information for Evaluating, Purchasing and Handling Chemicals; and
- Contractor shall submit a complete list of all the chemicals to be used for the Construction. The chemicals must be categorized in accordance with the applicable system of color coding.

1.3.6 Dangerous Goods

Contractor shall have a Dangerous Goods handling system that ensures compliance with the Hazardous Substance Rule 2003, Factory Act 1934 and local applicable laws for transportation on road and railroad.

1.3.7 Management System

1.3.7.1 For Construction related activities

- Contractor shall compile an interface document, as part of the Contractor Execution Plan,

documenting that Contractor has an implemented and documented Management System in compliance with the HSE Regulations listed hereunder:

- HSE Regulations (OSHA Regulations, Safeguard Policy Statement (June, 2009) and IFC-EHS Guidelines for Electric Power Transmission and Distribution etc.);
- Factory Act, 1934; and
- Client's governing document.

- Contractor shall point out non-conformance's / deviations related to the requirements as described above and demonstrate that the significance of the individual non-conformance's / deviations have been assessed from a safety standpoint;
- Contractor shall give necessary training in the understanding of the philosophy behind the applicable Acts, Regulations and Provisions;
- Contractor shall identify Client's HSE directives relevant to the Work. Personnel shall be trained in order to achieve necessary working competence within the identified Client HSE directives. Contractor shall keep records of the training Personnel have received; and
- Contractor shall have put in place objectives, actions and measurements encompassing all organizational levels at Contractor in order to ensure that a sound health, environment and safety culture is established and maintained for the Work.
- Contractor workers who climb transmission towers shall utilize enhanced fall protection equipment and techniques. Climbers shall never be allowed to drop or slide down a pole or structure more than two feet. Fall protection or fall restriction devices shall be used when working at heights over 6 feet with the exception of ladder use.

1.3.7.2 Personal Protective Equipment

PPEs are equipment worn to minimize exposure to a variety of hazards which cannot be avoided due to engineering measure (residual impact). It includes gloves, foot and eye protection, protective hearing devices (earplugs, muffs) hard hats, respirators, full body suits etc. Contractor shall be responsible to provide PPEs to working staff and ensure its use. Contractor shall adhere to Client's HSE requirements related to "Personal Protective Equipment (PPEs)" in respect of PPE. Contractor shall, at its own expense, provide Personnel for duty staff with all necessary protective clothing and equipment suitable for working conditions.

Table 1.1: Recommended Personal Protective Equipment According to Hazard

Sr. No	Type of Protection	Workplace Hazard	Suggested PPEs
1	Over All, Exterior garments	Entanglement, chemical spill safeguard etc.	Long pants, shirt with sleeves (no tank tops or shorts)
2	High Visibility Vests	Accidental hazard etc.	A reflective vest will be worn outside of any other garments
3	Foot protection	Falling or rolling objects, pointed objects. Corrosive or hot liquids	Safety toed footwear / boots/ shoes
4	Eye and Face Protection	Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation	Safety Glasses, Spectacles and Goggles. Spectacles with side shield. Prescription Lenses. Sun Glasses. Special Helmets or shields/ Face shields.
5	Head Protection	Falling objects, inadequate height clearance, and overhead power cords.	Hard hats with top and side impact protection. Hard hats shall be worn with the brim pointed forward.
6	Hearing protection	Noise, ultra-sound	Earplugs, muffs

Sr. No	Type of Protection	Workplace Hazard	Suggested PPEs
7	Hand Protection	Hazardous materials, cuts or lacerations, vibrations, extreme temperature	Gloves (Plastic, leather, fireproof and rubber)
8	Breathing Protection	Dusts, fogs, fumes, mists, gases, smokes, vapors	Facemasks
9	Falling Hazard Protection	Injury and death etc.	Safety Belt/Chains, Locks

Source: General IFC- Environmental, Health, and Safety (EHS) Guidelines

In order to highlight the risk and identify potential hazards at workplace, contractor shall be responsible for manage the following (not limited to) set of Safety Sign Posts and Markings in the working zones for the dual purpose of safety of workers as well as visitor/community.

- Authorized entry only (workplace hazards);
- Caution;
- Climb with caution;
- Work personnel only;
- Contractor's gate;
- Danger;
- Dangerous conditions;
- Falling hazard;
- Hard hats;
- Hazardous area;
- Men at work;
- Moving equipment;
- Risk of serious injury;
- Emergency assembly point;
- Shock hazard;
- Trip hazard (wet/slippery surface);
- Visitors;
- Warning;
- Transport control signs; and
- Security barriers;

Contractor shall make arrangements for marking/signs of hazardous goods/materials which should be posted on the boxes for haulage. Tentative list is attached as "Annex B" but contractor shall not limit to these only.

1.3.7.3 Radioactive Sources (if used)

Contractor shall have a documented system to ensure that the activity is in compliance with regulations and provisions stipulated by the Country's Radiation Protection Authority for the use of radioactive material.

1.3.7.4 Reporting

- Contractor shall immediately inform of organizational changes relevant for the Contractor and/or the Work;
- Contractor shall immediately forward internal and external audit reports conducted by the

Contractor relevant to the Work;

- On a monthly basis Contractor shall provide deviation permits applied for and nonconformity status; and
- Contractor shall report to the Client on a quarterly basis amount and type of chemicals supplied, used, discharged and re-injected. The report shall be made in the format as specified by Client. Contractor shall assure that total annual use and discharge of chemicals supplied are within specified discharge permit.

1.3.7.5 Safety Training

- Contractor shall ensure that electrical T/L safety training shall be recommended, including necessary refresher courses;
- Contractor shall ensure that Personnel have passed the required HSE training before going at workplace as defined by Client. This course requirement shall include Personnel provided by Contractor and Subcontractors;
- Contractor shall be responsible for ensuring that Personnel possess all required safety qualifications described in Client's HSE Directive;
- Personnel shall be available at all times for periodic drills, instructions on survival, lifesaving and fire-fighting as requested and conducted by Client at the Worksite;
- Contractor's management and relevant Personnel shall attend HSE training and courses as required; and
- All costs, including but not limited to travel, accommodation, per diem, course fees, salary, related to training of all Personnel shall be borne by Contractor.

1.3.7.6 Security

- Contractor shall comply with the Client guidelines for Security Control. Alcohol concentration is not allowed;
- Contractor shall be able to verify the identity of Personnel who shall perform Work at construction site, camps and offices, on installations and in premises employed by the Client. When Contractor uses hired Personnel references from earlier employment shall be verified;
- Contractor shall maintain prudent office security for office areas used for projects/activities and/or staff; including access control, ID badge usage, and burglar alarm / guard arrangement;
- Contractor shall maintain information security regarding Client and Project information; including clear desk policy, sensitive documents control and confidentiality measurements; and
- Contractor shall maintain computer and communications security for any computer system and network being used for handling project information; including controlled computer access, virus protection, security updates, Firewalls and backup routines.

1.3.7.7 Lifting Operations

- Contractor shall have a system established to ensure that Personnel who are responsible for, or are involved in, maintenance/inspection of lifting equipment and execution of lifting operations;
- Contractor shall have a system implemented for systematic inspection and maintenance of lifting appliances and lifting gear in accordance with statutory requirements; and
- Contractor shall ensure that all Plant and/or Equipment being supplied to any Worksite is to be either, placed and operated at height or placed and operated over an area where Persons

are working below shall have:

- In place a Dropped Objective Survey or Inspection Procedure for the Plant;
- Identified those items of Plant or Equipment or other components that, if fail, have a potential to injure Persons; and
- In place a method for securing primary components or parts such that should failure occur of the all Equipment and their parts are not able to fall and injure Persons. This may be primary suitable means of security or secondary retention methods. Both should be in accordance with the manufacturer's recommendations and accompanied by a Hazard / Risk Assessment.

1.3.7.8 Waste Handling and Tracking

- Contractor shall ensure use of Authority approved waste treatment or disposal sites. Client reserves the right to request Contractor to submit supporting documentation of approved sites. Client reserves the right to reject the use of sites not found acceptable; and
- Contractor shall have implemented a system for identifying, classifying and handling of waste. Hazardous waste shall be handled according to Authority regulations and household waste and production waste shall be source segregated for recycling purpose.

1.3.7.9 First Aid

Contractor shall be responsible for the provision of first aid services for their workers and those of its Sub-Contractors, and for providing transport for injured persons to hospital or other appropriate destination as and when required. Vehicles that are generally used for site work shall carry a first aid kit complying with OHS regulations.

1.3.7.10 Working Environment

- Contractor shall undergo particular training with regard to relevant working environment factors related to implementation of Work, the use of work equipment and signalling and safety sign posting at the workplace shall be given to the individual employee and supervisor (Project Management Consultant (PMC)/ Facility Management Consultant (FMC) for Environment & Resettlement Aspects);
- Contractor shall actively take part in the working environmental activities that are carried out at the Worksite; and
- Contractor shall advise and assist Client in a pro-active manner in the implementation of the annual working environment program and provide input for the subsequent year program.

1.4 Contractor HSE Policy

Contractor HSE policy shall be intended to: help prevent accidents, illnesses and injuries; increase safety awareness; meet requirements of environmental, occupational health, and safety local and international laws and regulations; reduce institutional liability; and establish safety responsibilities for staff/workers at the project site and local community. Contractor HSE policy outlines safety responsibilities and training requirements to ensure individual and institutional compliance with relevant environmental health and safety laws, regulations, policies, and guidelines.

It shall be the Contractor(s) policy to perform work in the safest practicable manner, consistent with good local and international best practice. The Occupational health and safety of the staff, workers and all those likely to be affected by the construction activities is the responsibility of the Contractor(s); in addition to, adequate resources shall be made available to ensure the success of this policy. It shall

be the duty of the Contractor(s) to provide safe systems of work and do everything practicable to prevent injuries, property damage, loss of life and ill health by controlling the risks arising out of construction activities. Equally it shall be the duty of each worker/staff to exercise personal responsibility for his or her own safety and that of others and co-operate with his or her worker/staff in matters of health, safety.

It shall be the Contractor (s) policy to adhere completely to the requirements of the Occupational Health and Safety at Work etc. OSHA laws, SPS (June, 2009), IFC-EHS Guidelines for Electric Power Transmission and Distribution Factory Act 1934 and the Construction Regulations and all other Acts, Regulations and Codes of Practice, which are applicable to the constructions activities.

1.5 Contractor HSE Trained Staff

The Contractor shall be responsible for identifying necessary training and verifying that all senior level members and staff/workers of the Contractor squad are properly prepared to perform the construction work as defined in the bidding documents. The Contractor must develop and implement an HSE Training program for the Contractor squad to meet the Proposed Project requirements and the Statutory Requirements. For all above mentioned construction activities the Contractor staff/employees should be well HSE trained as per local and international laws. Before starting the each construction activities, the contractor shall designate and train a sufficient number of persons to assist the other staff to perform the construction activities.

1.5.1 Contractor Staff for HSE

The Constructions phase of Project is expected to be more critical in terms of HSE considerations. The following Table 1.2 illustrates the requisite deployment of contractor's staff for HSE during construction phase of the proposed Project.

Table 1.2: Contractor's Staff for HSE

Sr. No.	Contractor Staff Designation	Number of Personnel	Duration	Duties
1	Environmental / HSE Officer	01	Whole Construction Phase	• Coordinate with Top Management to ensure the implementation of HSE Provisions at site; • To ensure the use of SOP during every working activities; • Ensure availability and maintained of PPEs to each and every worker at workplace; and • Ensure the record maintenance of each HSE related occurrences and communicate with their authority on regular basis. • Responsible for preparation of monthly, quarterly and completion reports (and other if any). • Responsible for implementation of EMP, NOC and other contractual as well as regulatory requirements triggered during the project execution. • Responsible for supervision/ monitoring of all the waste management operations and the associated staff.
2	Social / Revenue Officer	01	Whole Construction Phase	• Review and validate the monitoring reports; • Status of RP implementation

Sr. No.	Contractor Staff Designation	Number of Personnel	Duration	Duties
				including payment of compensation to the DPs; • Status of redressal of community complaints and time spent to resolve the community grievances; • Carry out the consultations with DPs, officials of project management and other concerned departments to share the feedback/ lessons learnt; • Identify gaps regarding RP implementation and suggest remedial measures; and also develop a corrective action plan; and • Assess the resettlement implementation efficiency, effectiveness, impact and its sustainability.
3	Sanitary Workers	At least 01 for each camp site	Whole Construction Phase	Responsible for collection handling and disposal of waste in safe, effective and environment friendly ways.
4	Medical Staff / Dispenser	01 for each camp site	Whole Construction Phase	Responsible for medical waste segregation, handling, storage and disposal in a safe and environment friendly manner.

Note: *For disposal of Construction and Demolition (C&D) waste, it is the responsibility of Construction Contractor(s) to engage licensed district level waste contractor for disposal of C&D waste after consultation with Local Authority. The proposed contractor staff will be selected in collaboration with ESIC NTDC after the prior approval.*

1.6 Work Permit Provisions

Importance of work permit system in any construction projects cannot be neglected. A work permit is a written form used to authorize jobs that expose workers to serious hazards. Permits only allow authorized personnel to perform those serious hazard activities at specified times and in a way set out in the permit and referenced documents. It identifies the work to be done, the hazards involved, and the necessary preparation and precautions for the job. A permit to work might be required for activities such as:

- Electrical works;
- Hot works;
- Excavation;
- Lone working;
- Lifting operations;
- Work in confined spaces;
- Work to high risk spaces such as laboratories, or industrial plant;
- Work at height;
- Work to roofs;
- Temporary works;
- Work with asbestos;

- Demolition; and
- Work to high pressure systems.

It is recommended that a safe work permit provisions for the identified hazardous construction activities for the proposed project will be integral part in the tender documents. Contractors will be responsible for the compliance according to the OSHA permit requirements. A safe work permit will be required for construction work, maintenance of machinery, repair or within the workplace. Permits are generally not required for work performed in office buildings and maintenance shops except for confined space entry and hot work on equipment that has been in service.

1.7 Schedule of Prices

A schedule of prices is a document used in tendering in the construction industry in which material, parts and labours (and their costs/prices) are itemized. Its objectives are:

- To provide sufficient information on the categories and quantities of health, safety and security items to be included in the contractor tender offer so that their bid may be prepared efficiently and accurately; and
- To assure a minimum level of required HSE provision from each contractor.

Items for HSE are provided in the bidding document, Price Schedule No. 4 (i) (INSTALLATION AND OTHER SERVICES), J and K.

1.8 Non Conformance and Penalties

Non-compliance situations and conditions may be identified through (but not limited to) audits, inspections and monitoring. HSE no-compliances can be identified, ranked and recorded at three levels. Once the level of a noncompliance has been identified and communicated to the contractor, the contractor must provide a written response containing a plan of action, including a timeline for remediation of the noncompliance with a plan to prevent recurrence. Penalties may be levied on the contractor as a result of nonconformity. For detailed information regarding penalties associated with nonconformity, refer to the Inspection, Monitoring and Enforcement Procedures in the EIA.

NOTE: A temporary work suspension for cause may be enforced in case of “Imminent Danger” or “Wilful/Repeat” nonconformities. Costs associated with work suspension due to nonconformity shall be the borne only by the contractor at no cost to the owner or its agents. In this event, the contractor forfeits their right to a claim of delay.

The contractor shall establish, implement and maintain a procedure (s) for dealing with actual and potential nonconformity (ies) and for taking corrective action and preventative action. The procedure(s) shall define requirements for:

a. Identifying and correcting nonconformity(ies) and taking action(s) to mitigate their HSE consequences;
b. Investigating non-conformity(ies), determining their cause(s) and taking actions in order to avoid their recurrence;
c. Evaluating the need for action(s) to prevent nonconformity(ies) and implementing appropriate actions designed to avoid their occurrence;
d. Recording and communicating the results of corrective and preventive action(s) taken; and
e. Reviewing the effectiveness of corrective and preventative action(s) taken.

Any stakeholder may identify an issue of noncompliance during the course of activities. Nonconformities shall be documented and assigned a severity and timeline for remediation. If the contractor does not remediate the nonconformity in the required timeframe, penalties may be assessed.

If the ESIC-NTDC found any employee of the Contractor or its Sub-Contractor(s) to be acting or working in a manner that is found to be non-compliant with the HSE requirements of the Project as specified under Article/Sections or as required by regulatory agencies of the local/state government, the Owner/ESIC-NTDC shall have the authority to order immediate correction or cessation of the non-compliant occurrence. Accordingly, the Contractor, its sub-Contractor(s) shall take immediate steps to eradicate such non-compliance and shall perform in the manner prescribed by the Contract.

If the Contractor or any of its Subcontractor(s) fails to correct/remedy any noted health, safety and environmental non-conformance(s) with the time period specified by ESIC-NTDC, the ESIC-NTDC shall forthwith issue a 'Notice of Non-Compliance' to the contractor and shall exercise any of all of the following:

a. Removal of the Contractor's or Sub-Contractor's employee(s) from the Project responsible for the implementation of such measure(s);
b. Retention of some amount as monetary penalty from any payments due or to become due to the Contractor that has been assessed/determined by the ESIC-NTDC to the extent of breach of HSE principles/provisions;
c. Failure to the compliance after the above two, the ESIC-NTDC shall issue a 'Final Warning' to the Contractor or its Sub-Contractor(s) in writing with a copy to the competent authority; and
d. However, if the Contractor still fails to comply with any of his obligations regarding prescribed HSE requirements despite Final Warning from ESIC-NTDC, such failure shall be considered as breach of the Contractor's Obligations under the Contract and shall be dealt as per contract provisions.

APPENDIX-A

Tenderer HSE Management System Questionnaire

GENERAL INFORMATION
Name and Address of Company

Post Code …… ……

Registered office and sub-offices if different from above

Telephone Number: ……....

Fax Number: ……

Website address: …….

E-mail: …… ……

Type of Company (e.g.: PLC, Private, Partnership etc.)

Date Established

Incorporated in ……

Parent Company

Incorporated in

Ultimate Parent Company

Incorporated in

Subsidiary and associate companies

Names of Key Personnel

Name and Address of Bankers

Principal Business Activities

This sample questionnaire is a guideline questionnaire which will be a part of the tender document and involved in evaluation process. The questionnaire is to be completed by the contractor tendering and submitted with their tender offer. The objective of the questionnaire is to provide an overview of the status of the contractor's HSE management system. Contractors will be required to verify their responses noted in their questionnaire by providing evidence of their ability and capacity in relevant matters.

Please be advised that if your tender is successful you may be required to provide:

- A Risk Assessment for the Project;
- A Site Safety and Security Plan;
- Occupational Health and Safety Plan; and
- Job Safety Assessments or Safe Work Method Statements for individual activities that have a medium to high hazard level.

Certification: The information provided in this questionnaire is an accurate summary of the company's occupational health and safety management.	
Company Name:	
Signed:	Name:
Position:	Date:
Contract Details:	
Contract Name.	Contract Number:
Name and Contact Details of Representative:	

N/A = Not applicable or relevant to the this contract

Management Element	Tenderer Response to Clarification	Evidence/ Company's Clarification
1. Leadership and Commitment		
a) What is the commitment of top management towards HSE at workplace?		
b) How does top management actively endorse a positive HSE culture in the workplace?		
c) What does top management do to ensure the health and welfare of employees is established, maintained and given priority like accommodation, meals, rotation, medical care, recreation facilities etc.?		
2. Policy and Strategic Objectives		
2.1 HSE Policy Documents		
a) Has the organization's top management documented, authorized and issued a HSE Policy?		
b) Does the policy address legal requirements for HSE, commitment to the prevention of accidents and provide a		

Management Element	Tenderer Response to Clarification	Evidence/ Company's Clarification
framework for setting and reviewing OHS objectives?		
c) Who has been identified and appointed in the organization for overall responsibility and accountability for HSE?		
2.2 Availability of HSE Policy Statements to employees?		
a) How do you communicate your policies requirements or any amendments thereof to your employees?		
2.3 HSE contract strategic objectives?		
a) How are HSE objectives set?		
b) How are these objectives communicated?		
c) How is accomplishment of these objectives tracked and monitored?		
3. Organization, Responsibilities, Resources, Standards and Procedures		
3.1 Organization, structure to manage HSE		
a) How is the organization structured and resourced to manage HSE?		
b) How are lines of reporting structured and roles and responsibilities defined?		
c) How do you ensure the managers and supervisors understand their HSE duties and responsibilities?		
d) How have you made provision for HSE communication meetings?		
3.2 Training		
a) How do you identify training needs including training for high risk activities and specialized training?		
b) How do you ensure all employees have received appropriate HSE training and that it is recorded and monitored?		
3.3 HSE Competence		
a) What arrangements do you have to ensure new employees have the required knowledge of HSE, and how is this knowledge kept up to date?		
b) How are employees informed of the specific hazards arising out of the nature of their work?		
c) How do you ensure people are		

Management Element	Tenderer Response to Clarification	Evidence/ Company's Clarification
competent to perform a job that involves hazards and risks?		
d) How do you ensure HSE advisors are competent in presentation skills?		
3.4 HSE Standards (ISO 14001 and OHSAS 18001 or equivalent e.g. OSHA)		
a) How do you identify, obtain, review and communicate HSE legislation, regulations, external standards and other requirements affecting the organization?		
b) How the company is assured that these requirements are met and verified?		
3.5 Assessment of suitability of Subcontractors/ other companies		
a) How do you assess the: i) HSE competence of subcontractors?		
ii) HSE performance record of the Subcontractors and companies with whom you place contracts?		
b) Where do you spell out the HSE requirements you require your Contractors to meet? (What standards apply?)		
c) What are the HSE terms and conditions dictated in your sub contract agreements?		
d) How do you ensure these requirements are met and verified?		.
4. Hazards and Effects Management		
4.1 Hazards and effects assessment		
a) How do you identify and document risk?		
b) How do you ensure the proper controls are in place, applied and complied with?		
4.2 Occupational health exposure		
a) What occupational health monitoring do you do?		
b) In which areas of your business do you focus this occupational health monitoring?		
c) What health exposures do you measure and record?		
d) How do you manage occupational health exposures?		
4.3 Handling of chemicals, noise, asbestos, and radiation and other occupational health hazards		

Management Element	Tenderer Response to Clarification	Evidence/ Company's Clarification
a) How do you evaluate the health risks presented by the transport, storage, handling and disposal of chemicals?		
b) How do you evaluate the health risks presented by noise, radiation and/or asbestos where applicable?		
c) How do you ensure that minimal use is made of chemicals which are potentially harmful to the environment?		
d) How do you ensure the quality of the material safety data sheets (MSD)?		
4.4 Personal Protective Equipment		
a) How do you manage PPE requirements?		
4.5 Waste Management		
a) How do you identify and manage your hazardous waste?		
4.6 Drugs and Alcohol		
a) How do you manage alcohol and drug abuse?		
b) Explain how you manage the health and wellbeing of your workforce?		
5. Planning and Procedures		
5.1 HSE Operations manuals		
a) Please attach an electronic copy of your HSE manual and HSE plan?		
b) How do you implement these requirements?		
c) What are the company arrangements for managing safe systems of work?		
d) How are you assured that the HSE system is fit for purpose?		
e) How are safety rules communicated and compliance monitored in the work place?		
f) How are safety behaviours applied and monitored in the work place?		
5.2 Equipment control and maintenance		
a) Describe the HSE Critical equipment specifically identified?		
b) How do you ensure plant and equipment is inspected, certified, valid and safe for use?		

Management Element	Tenderer Response to Clarification	Evidence/ Company's Clarification
c) Do you have a preventive maintenance system?		
d) Explain you equipment inspection regime!		
5.3 Road Safety Management		
a) How do you manage road safety for all company vehicles?		
b) What standards are applied to your road safety management program?		
c) How do you monitor non-compliance with road safety standards and rules in the company?		
d) What actions are taken by management when violations are identified or reported?		
e) How many drivers of vehicles are trained in defensive driving?		
f) How do you manage vehicle load restraining where applicable?		
g) How many Motor Vehicle incidents have you had in the last two years?		
6.0 Implementation and Performance Monitoring		
6.1 Implementation and active performance monitoring of work activities		
a) How do you monitor HSE performance in the work place?		
b) What types of HSE performance indicators/measures are used in your company? Give examples!		
c) Provide examples of trending of your key HSE performance indicators!		
d) How is health performance recorded?		
e) What arrangements do you have to ensure personnel are fit to work in their designated role?		
f) How is environmental performance recorded?		
6.2 Statutory modifiable incidents		
a) How many reportable accidents have you had in the last five years? (Provide annual figures)		
6.3 Improvement or prohibition notices (in accordance with the regulations pertaining to safety and occupational health procedures)		
a) Provide details of any work prohibitions from government or client imposed on the company?		

Management Element	Tenderer Response to Clarification	Evidence/ Company's Clarification
b) Have you ever had a contract cancelled due to poor HSE performance?		
6.4 Incident investigation and reporting		
a) How do you identify the critical factors, immediate causes, underlying causes and latent (hidden) management system failures?		
b) Who normally conducts incident investigations?		
c) How do you determine who should lead the investigation?		
d) How do you ensure that the learning's from all incidents, including near misses, are communicated?		
7. Auditing		
7.1 Auditing		
a) How do you plan and schedule audits and what range of auditing is covered?		
b) How are audit findings tracked and closed out?		
c) Who in your organization is trained and certified to conduct internal management system audits?		
8. HSE Management Performance Reviews		
a) How often are board level management performance reviews conducted?		
g) How do you communicate corporate HSE performance findings to workers?		

9	**Insurances: Please provide copy of Certificate of Currency**				
Insurance	**Insurer / Not Applicable**	**Policy Name:**	**Policy No:**	**Expiry Date:**	**Coverage**
Workers Compensation					
Public Liability					
Professional Indemnity					
Other					

10	**Certificates / Licenses / Industry Training: Please provide copies or samples**			
License/Certificate:	**Licensee:**	**License No.**	**Expiry Date:**	**Notes**

11	Company Reference (Please provide the four (04) most recent relevant contracts completed by company)				
Five (05) Contracts for International Competitive Bidders, and Three (03) Contracts for National Bidders	**Contract 1**	**Contract 2**	**Contract 3**	**Contract 4**	**Contract 5**
Contract Description					
Client					
Client's Contact					
Contract No.					
No. of Key HSE Personal					
HSE Staff/Worker intensity					
No. of Lose Time Injury					
No. of Person Days on Contract					
Total No. of Days Lost					
Contract Completion Certificate (attached Copy)					

Tenderer Personnel assigned to manage the HSE hazards identified for this Contract are:
- Tenderer Personnel 1 (name, qualifications, experience): **As per Key personnel List.**
- Tenderer Personnel 2 (name, qualifications, experience): **As per Key personnel List.**
- Tenderer Personnel 3 (name, qualifications, experience): **As per Key personnel List.**
- (add if required)

Quality check
- All relevant questions are answered:
  YES/NO
- Evidence of all necessary element are attached:
  YES/NO
- Information about insurance plan is enclosed with evidence:
  YES/NO
- Information about certificates/licenses/training is enclosed with evidence:
  YES/NO
- Information about company references are enclosed with contract completion certificate:
  YES/NO
- All HSE key personals are identified for the contract:
  YES/NO

Signed by

Tenderer Name: Date:

Name of Person: Position:

APPENDIX-B

Hazard Warning Signs/Marking

Compressed Gas

Explosion Danger - Gas under pressure.
May explode if heated, punctured or dropped.

Health Hazard

May cause allergic reaction, cancer, birth defects, damage organs or harm fertility or unborn children.

Flammable Material

Potential Fire Hazard.
Catches fire spontaneously if exposed to air or water or when exposed to heat sparks or flames or as a result of friction.

Harmful or Fatal

Acute Toxicity.
Potentially fatal poisonous substance if inhaled, swallowed, or through skin contact, even in small amounts.

Oxidizing

Fire and/or Explosion Risk in the presence of flammable or combustible material.
May cause fire or enhance the combustion of other materials

Harmful

to skin, eyes or respiratory system. Fatal in large quantities. Hazardous to the Ozone Layer.

Explosion Hazard

Risk of explosion due to fire, shock, friction, heat or puncture

Harmful to the Environment

and/or aquatic life with long-lasting effects.

Corrosive

Causes severe Skin Burns & Eye Damage.
Is corrosive to metal.

Biohazardous Infectious Materials

For organisms or toxins that can cause serious disease in people or animals resulting in illness or death.

ENVIRONMENTAL MANAGEMENT PLAN

1

1.1 General

Environmental Management Plan (EMP) is a tool for the implementation of the all the suggested measures to make the project environmentally sustainable. It provides an overall approach for managing and monitoring the environmental, ecological and socio-economic issues of the proposed Project, and describes the institutional framework and reporting mechanism to implement EMP for the Project.

1.2 EMP Components

The EMP comprises following main components:

- EMP Objectives;
- Scope of the EMP;
- Environmental Policy, Legislation and Framework;
- ADB's Safeguard Policy Statement (2009);
- Institutional Requirements;
- Environmental Mitigation and Management Matrix;
- Environmental Monitoring Plan;
- Planning for EMP Implementation;
- Training and Capacity Building;
- Communication & Documentation;
- Management Plans;
- Chance Find Procedure;
- Public Disclosure;
- EMP Cost; and
- Summary of Environmental Cost.

1.3 EMP Objectives

The main objectives of the EMP are:

- Provide project impacts along with the proposed mitigation measures, and a corresponding implementation phase;
- To ensure that all necessary corrective actions are carried out in time to counter any adverse environmental impact;
- To ensure the regular monitoring of those factors which may affect the safety of the environment under a systematic monitoring approach;
- Define the roles and responsibilities of the Project Proponent, Contractor and Environmental & Social Impact Cell (ESIC) in the existing setup of proponent in order to effectively communicate environmental issues among them;
- Provide a procedure for timely action in the face of unanticipated environmental situation;
- Identify training requirements at various levels including Project Proponent, Supervisor (PMC/FMC for Environment & Resettlement Aspects) and Contractor;
- Provide a monitoring mechanism in the form of an environmental monitoring program, which includes monitoring parameters, monitoring frequency to ensure that all the mitigation measures are completely and effectively implemented;
- Provides estimation of environmental cost for the implementation of EMP;
- Define the requirements necessary for documenting compliance with EMP and communicating it to all the concerned regulatory agencies; and
- Provide other plans considering the project specific requirements.

1.4 Scope of the EMP

The scope of the EMP includes the construction phase of the proposed T/L Project:

All the activities performed during these phases will be controlled and monitored according to this EMP.

1.5 Environmental Policy, Legislation and Framework

The applicable polices, legislation, acts and guidelines are discussed in detail in Chapter 2 of EIA. However, following is the brief of the applicable policies, laws, regulations and guidelines related to the proposed Project:

- National Conservation Strategy, 1992;
- National Forest Policy, 2001;
- National Environmental Policy, 2005;
- National Electricity Policy, 2005;
- National Power Policy, 2013;
- ADB's Safeguard Policy Statement, 2009;
- Pakistan Labour Policy, 2010;
- ADB's Public Communication Policy 2011;
- National Climate Change Policy, 2012;
- ADB's Accountability Mechanism Policy 2012;
- National Disaster Risk Reduction Policy, 2013;
- Khyber Pakhtunkhwa Environmental Protection Act, 2014;
- Khyber Pakhtunkhwa Environmental Assessment Rules, 2021;
- Punjab Environmental Protection Act, 1997 (Amended, 2012, 2017);
- Pakistan Environmental Protection Agency, (Review of IEE and EIA) Regulations, 2022;
- National Environmental Quality Standards (2010);
- Punjab Environmental Quality Standards PEQS (2016);
- Occupational Safety and Health Convention (OSHC), 1981;
- The Khyber Pakhtunkhwa Forest Ordinance, 2002;
- The Khyber Pakhtunkhwa Wildlife and Biodiversity (Protection, Preservation, Conservation and Management) Act, 2015;
- Protection of Trees and Brushwood Act, 1949;
- Explosives Act, 1884;
- The Khyber Pakhtunkhwa Explosive Act, 2013;
- Pakistan Antiquities Act 1975;
- Khyber Pakhtunkhwa Antiquities Act, 2016;
- Pakistan Penal Code, 1860;
- The Protection against Harassment of Women at the Workplace Act, 2010;
- Employment of Children Act, 1991;
- Labour Laws as part of Constitution of Pakistan 1973;
- Guidelines for the Preparation and Review of Environmental Reports, 1997;
- Guideline for Solid Waste Management, 2005;
- Forest Act, 1927;
- Land Acquisition Act (LAA), 1894;
- Electricity Act, 1910;
- The Telegraph Act, 1885;
- Cutting of Trees (Prohibition) Act, 1975;
- National Disaster Management Act, 2010;
- NTDC Safety Considerations;
- Guidelines for Critical and Sensitive Areas, 1997;
- Checklist of Procedure for Environmental Assessment;
- Protected Areas Clearance Procedure;
- International Agreements/Conventions Relevant to the Project;

- UNESCO Convention on the Protection of the World's Cultural and Natural Heritage, 1972;
- International Trade of Endangered Species (CITES), 1975;
- Convention on Conservation of Migratory Species of Wild Animals, 1979;
- The Rio Declaration, 1992; and
- Convention on Biological Diversity, 1994.

1.6 ADB's Safeguard Policy Statement (2009)

Environmental safeguards requirements, including EIA requirements, are defined in ADB's SPS 2009. All projects funded by ADB must comply with SPS, 2009. The purpose of the SPS, 2009 is to establish an environmental review process to ensure that projects undertaken as part of programs funded under ADB loans are environmentally sound, are designed to operate in compliance with applicable regulatory requirements, and are not likely to cause significant environmental, health, or safety hazards.

1.7 Institutional Requirements

The institutional requirements for the construction phase of the proposed Project are provided in below sections.

1.7.1 Institutional Arrangements for Implementation of EMP during Construction Phase

The key players involved during construction phase of the proposed Project are the NTDC as employer/proponent, Supervisory Consultant (SC) (PMC/FMC for Environment & Resettlement Aspects), PMU, Provincial EPA (Punjab and KP-EPA) and the Contractor. The roles and responsibilities of these organizations are outlined below.

The following staff will be involved in the implementation of EMP:

- NTDC/Proponent/Employer;
- PMU;
- FMC/PMC as SC; and
- Contractor's Environmental Manager.

The employer NTDC will make Contractor bond through contract documents to implement the EIA including EMP and other terms and conditions of the Environmental Permit issued by the Punjab and KP-EPA. The whole EMP will be included as a clause of the contract documents. Construction camps will be established after necessary approvals and submission of Site-Specific EMPs to be developed in the light of the relevant agencies requirements, before commencement of new works. The organizational setup for implementation of EMP during construction phase is provided in **Figure 2.1**.

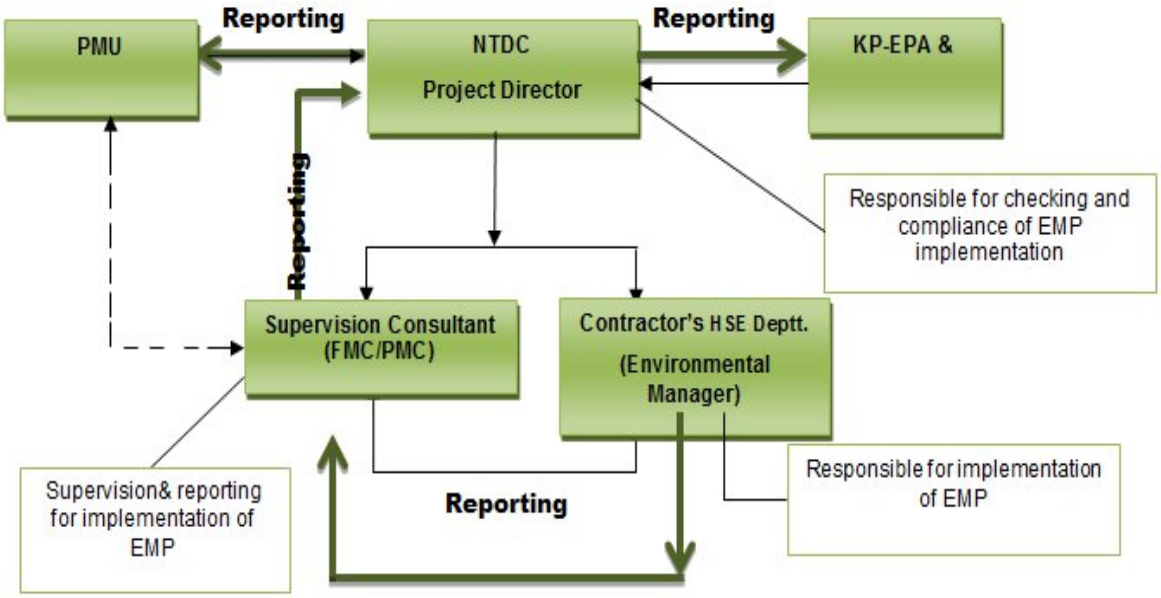

Figure 2.1: Organizational Setup for Implementation of EMP at Construction Phase

1.7.2 Roles and Responsibilities

a) Provincial EPAs

As per PEPA, 1997 and approval of 18th Amendment each provincial government has its own EPA responsible for environmental protection and pollution control. The provincial EPAs are responsible for the approval of the EIA and IEE of all the developmental projects under their jurisdictions. The concerned agency for the Proposed Project is Punjab and KP-EPA. Therefore, this agency will undertake audits (as and when required) of the proposed Project activities with respect to the protocols as defined in EMP.

b) Employer Concerned Staff (ESIC-NTDC)

ESIC-NTDC is directly in-charge for the financial and technical matters and directly reports to the Project Director and Punjab & KP-EPA. The roles and responsibilities of the employer, ESIC-NTDC will consist of:

- Ensuring that the required environmental training is provided to the concerned staff;
- To carrying out random site visits to the construction sites to review the environmental performance of the Contractor;
- Overall supervision of the SC (PMC/FMC) for all the environment and resettlement related activities during the construction stage;
- Review monitoring reports for the progress of environment related activities;
- Make sure that the Contractor is implementing the additional measures suggested by the SC (PMC/FMC) in environmental monitoring reports;
- Assessment of the crops, valuation of property (if any) and negotiation with the affectees for fixation of compensation to be paid for temporary acquisition of the land under the Towers;
- To estimate the crop compensation for the construction of foundations and erection of Towers and in the RoW during the stringing operations;

- Assist in checking genuine ownerships of the claimants, in consultation with the Revenue staff for prompt payment to the affectees;
- To ensure that the tenants get their rightful compensation as per prevailing law especially in case of loss of crops;
- Assist the Contractor for the timely payments of negotiated prices;
- To assist Contractor for obtaining necessary approvals from the concerned departments;
- Maintaining interface with the other lined departments/stakeholders; and
- Reporting to the Punjab and KP-EPA on status of EMP implementation.

c) PMU

The PMU shall be responsible to:

- Make sure that all the contractual obligations related to the environmental and social compliance are met;
- Monitor the progress regarding implementation of environmental safeguard as provided in the EMP;
- Oversee the compliance of all the monitoring programs as given in EMP;
- Check randomly whether monitoring of the environmental aspects of the Project during construction phase is being properly carried out;
- Document and disclose monitoring results and identify necessary corrective and preventive actions in the periodic monitoring reports (bi-annual reporting), and make follow-up on these actions to ensure progress toward the desired outcomes;
- Make sure that the Contractor is implementing the additional measures suggested by the M&E Contractor (ToRs for Third party monitoring is provided in the EIA Report; and
- Report the status of EMP compliance to NTDC.

d) Supervisory Consultant (SC) – PMC/FMC

Roles and responsibilities of SC will be:

- To oversee the performance of the Contractor to make sure that the Contractor is complying with EMP;
- Ensuring that the day-to-day construction activities are carried out in an environmentally and socially sound and sustainable manner;
- Strong coordination with the Contractor and NTDC;
- Preparing training materials and implementing programs;
- Ensure the implementation of the mitigation measures suggested in EMP;
- To supervise and monitor environmental activities being performed at site;
- To organize periodic environmental training programs and workshops for the consultant's and contractor's staff;
- Periodic reporting as mentioned in EMP; and
- Suggest any additional mitigation measures (if required).

e) Construction Contractor

Contractors will be bond to appoint site based Environmental Manager with relevant educational background and experience for each construction camp. Contractors' Environmental Manager will carry out following activities:

- Implementation of the mitigation measures at construction site;
- Contractor will be bond through contract to take actions against all the special and general provisions of the contract document;
- Contractor will make sure the compliance of EMP recommendations and will also be responsible for effective liaison with local heads of villages;
- Provision of proper Personal Protective Equipment (PPEs) to the workers and train them for their proper use;
- To conduct the environmental and health & safety trainings to the workers/labour; and
- Coordinate with Environmental Specialist of ESIC-NTDC.

1.8 Environmental Mitigation and Management Matrix

Environmental Mitigation and Management Matrix (EMMM) is considered as one of the main elements of EMP. It will be used as the management tool for the implementation of mitigation measures. The plan includes following:

- The envisaged impacts as identified in EIA and their recommended mitigation measures; and
- The person/organization directly responsible for adhering to or executing the required mitigation measures.

It is highlighted that although the responsibilities for executing and monitoring the mitigation measures have been delegated to different organizations, ESIC of NTDC will hold the primary responsibility for ensuring the full implementation of EMP. **Table 2.1** provides information about all impacts to be raised due to project activities during construction phase.

The Contractor(s) will be responsible for the preparation of Site Specific EMP (SSEMP) on the same format of this EMP along with the site specific plans based on the guidelines provided in this Chapter. However, a SSEMP guide and template for the contractor is provided in the EIA Report**.**

Table 2.1: Environmental Mitigation and Management Matrix

Sr. No	Impacts	Mitigation Measure	Performance Monitoring Indicators	Responsibility	
				Implementation	Monitoring
Design /Pre-construction Phase					
1.	**Permanent Land Acquisition** The proposed T/L will not involve the permanent land acquisition as per NTDC practice in the light of LAA and Telegraph Act, 1910. However, for the construction of contractor camps, access roads, borrow areas etc. temporary land will be required at the locations mentioned in Chapter 3**.**	No specific mitigation measures can be suggested as no land will be acquired on permanent basis.	Not required	District Government Abbottabad and Rawalpindi	Proponent
2.	**Temporary Acquisition of Land** The Contractors will require temporary land acquisition for construction camp, quarries and access road development. The approximate area[1] required for the establishment of one Contractor's camp facilities will be 1500 m^2 at the different locations.	The land will be selected and leased prior to the start of construction phase. Land will be directly rented from the private landowners by the Contractors. The acquisition will be covered by short-term lease agreements between the landowners and Contractor. Rental terms will be negotiated to the satisfaction of the concerned landowners and the agreement will be in local language to make the process clear. In addition, the general guidelines mentioned in Chapter 6will be followed to minimize the impacts on the landuse.	• Compensation and land lease records	District Government Abbottabad and Rawalpindi	Proponent
3.	**Route (Alignment) Optimization** Improper route selection of proposed T/L from Sangal to Maira will lead to disturbance to ecological sensitive areas and	The environment team along with design expert optimized the T/L route and finalized the Route B. Considering the habitat evaluation, topography, geological condition along the T/L route and other design specification; the optimized Route B is the only final	• Confirmation of design incorporation. • Audits and Checks	CC	Proponent

[1]As per designer's recommendation which may be finalized during implementation phase as per requirement.

Sr. No	Impacts	Mitigation Measure	Performance Monitoring Indicators	Responsibility	
				Implementation	Monitoring
	social issues of resettlement and displacement of people.	feasible route for the proposed project.			
4.	**Seismicity** The T/L route alignment between angle markers/towers from SM-01 to SM-68 from locality, Sangal to Baroothi traverses through a seismically active zone characterized as moderately to severe damage category i.e., zone-3 with g-value between 0.24 – 0.32. The remaining part of the T/L up to the proposed substation at Maira, passes through areas of relatively passive seismicity and is classified as zone- 2B with g-value between 0.16 – 0.24, and is considered as minor to moderate seismicity zone.	For foundation design of angle towers, safety factors correspond to seismic activities like earthquakes will be addressed with extra precautionary measures particularly in the mountainous terrain. Distance to prevailing major tectonic lineament is regarded as the crucial factor in assessment of safety factor to foundation design.	• Confirmation of design incorporation.	CC	Proponent
5.	**Landslide and Slope Stability** As per the details and outcomes of the slope map during the Geo-Hazard Assessment Study, 60% slopes in the project component area fall in horizontal to moderate categories. However, 40% slopes along the T/L route alignment is categorized as 'Steep Slope', which indicates high probability of landslides and rock fall etc. The map showing the slope classes is attached as Chapter 6**.**	• The recommendations of the Geo-Hazard Assessment Study as part of the project scope will be followed during the construction phase of the Project; • In general, structures are located to avoid potential slope instability hazards wherever possible, and newly constructed slopes will be designed with an adequate safety factor against failure; and • If feasible, structures will be located with sufficient setback from slopes to mitigate the potential for slope instability during construction and operation. Where structures cannot be moved or realigned, slope instability mitigation techniques may include modification of slope geometry, hydrogeological mitigation, and slope reinforcement methods.	• Visual observations, and • Confirmation of design incorporation.	CC	Proponent
6.	**Snow Avalanche**				

Sr. No	Impacts	Mitigation Measure	Performance Monitoring Indicators	Responsibility	
				Implementation	Monitoring
	Snow avalanches can damage T/L towers by snow thrust loading or by impact of rock and trees moving with the avalanche downslope. several tensional cracks and separation of blocks were also observed at Tower # 60 of T/L	Use a steel monopole structure fixed atop a concrete pier with an adjacent steel deflector post facing into the direction of the avalanche path. All such angle marker locations/ sites will be further re-evaluated by a snow avalanche expert, during detail foundation design stage and during the geotechnical investigation and next stage of studies.	• Visual observations, and • Confirmation of design incorporation.	CC	Proponent
7.	**Ground Vegetation and Fauna** Initially, few trees and ground vegetation will be cleared for the construction of camping sites to be established for the maintenance of heavy working machinery and for the keeping of storage materials in advance. Clearing of the ground bushes may affect the habitat of some animals which are residing in the bushes and scattered grasses. Habitat loss caused by construction of project infrastructure will not have any significant impact on the population of all vegetation type but some plants which are less in population should be harm more.	• At this stage no specific measures are required but the only one measure that can be adopted at this stage is to minimize cutting of ground vegetation and to minimize the noise of the machinery as much as possible; • Moreover, hunting of wild animals and birds will be strictly prohibited; • Provide awareness training to staff and contractors about the wildlife species and their basic habitat; • Providing reward to those persons who sighted wildlife species of conservation importance; • Retain as much natural vegetation as possible because it requires years to raise a tree but a day to clear fell a large area; and • Management regarding solid waste will be the prior consideration during camping site before the construction phase and all waste will be disposed at designated sites and a waste management plan will be developed and implemented.	• Visual observations	CC	Proponent
8.	**Socio-Economic Environment** Temporarily disturbance due to the field investigations and drilling activities. This impact can be categorized as indirect, low, site-	No mitigations measures are required except good engineering practices to avoid and reduce these low adverse impacts.	Not required	CC	Proponent

Sr. No	Impacts	Mitigation Measure	Performance Monitoring Indicators	Responsibility	
				Implementation	Monitoring
	specific, short term, temporary, low probable and reversible.				
		Construction Phase			
1.	**Site Accessibility** Certain areas where the Contractor has to develop a few new Jeepable tracks by following the natural topography of the area and minimum damage to the trees & crops and causing soil erosion, soil contamination, air and noise problems during the upgradation and widening of access roads.	Contractor will be bound not to cause any damage to the existing roads and village tracks during construction works and due to movement of heavy vehicles. Mitigations mentioned in section 6.6.2.1 will be adopted.	• Regular observation and photographic record of transportation route, • Road/track repair records, • Compensation records for damages of crop, trees and other infrastructure (if happens)	CC	Proponent
2.	**Impacts on Flora** Approximately/ estimated 2272 trees will be cut down in which 886 are conifers and 1386 are broad leaved trees. Trees mostly observed along the CoI are Chir (*Pinus roxburghii*), Shisham (*Dalbergia sisso*), Phulai (*Acacia modesta*), Olive (*Olea ferruginea*), Sumbal (*Bombax ceiba*) and Fig (*Ficus carica*). The details are given in the Chapter 6. Trees cutting involved along CoI will show adverse impact on the environment.	• NOC from the concerned department will be required while working in the Reserve forest and for cutting of trees; • For replacement of one tree, ten trees will be planted in accordance with the tree plantation plan of the report. Approximately/ estimated about 22720 plants will be raised in accordance with the tree plantation plan; • Compensation will be made to the forest department either Reserve or Guzara forest (80% of the total goes to the community and 20% to the forest department for managerial charges in case of Guzara forest); and • Contractors will warn their labours not to do any activities which harm the trees and wild animals. Mitigations mentioned in section 6.7.2.2 will be adopted.	• NOC for working in reserved /protected forest. • Compensation record, • Tree plantation implementation record	CC	Proponent

Sr. No	Impacts	Mitigation Measure	Performance Monitoring Indicators	Responsibility	
				Implementation	Monitoring
3.	**Impacts on Avifauna/ Birds** Cutting of forest trees compelled the birds to fly away due to the huge noise of construction machinery. Moreover, dust emissions, exhaust emissions (cause air pollution), trash and stored materials, soil compaction (affect grassland birds that feed on invertebrates by reducing prey abundance in the area), drainage alteration, siltation, removal of vegetation, noxious weeds and fires in the forest	• Entrance to sensitive areas during critical periods of migration, breeding and feeding of birds will be prohibited; and • Last but not the least, Ecologist expert will accompany with the installation team at the time of installation of pole tower in order to ensure to identify those trees of high value regarding trees of large foliage which is suitable for wildlife and avifauna habitat. • All the mitigation mentioned in Section 6.6.2.3 will be adopted to protect the project area avi-fauna.	• Visual observation and photographic record • Regular departmental and community consultation record (Minutes of meeting)	CC	Proponent
4.	**Loss of Crops** The damages may occur to existing crops and tree (if any) during the construction stage due to Considerable vehicular movement for transportation and the stringing of conductors while involving movement of equipment and vehicles. It is estimated that about 27248 hectare of crops of agriculture land in the RoW will be damaged due to construction of the footings, field investigations, stringing of conductors, accessibility tracks/roads round the year. This impact can be categorized as direct, moderate, site-specific, medium term, temporary, high	• Compensation will be paid, in accordance with the prevailing market prices and uniformity in rates will be ensured within the local areas; • The whole process of the payment to the farmers will be made transparent, judicious and without any discrimination or favour; • Minimum possible area will be disturbed for the construction of new paths or roads for carriage of machinery and materials; and • As far as possible, barren land without any crop will be selected for the camp sites and disturbance to the crops and natural vegetation will be avoided as much as possible.	• Compensation record • Establishment of Grievance Redressal Mechanism and Grievance Redress records • Stakeholder consultation record (Minutes of meetings)	CC	Proponent

Sr. No	Impacts	Mitigation Measure	Performance Monitoring Indicators	Responsibility	
				Implementation	Monitoring
	probability and reversible.				
5.	**Traffic Issues** The proposed construction activities and movement of heavy project vehicles for construction material supply and movement of towers, traffic problems may arise for the commuters and transporters travelling to the proposed areas. The problems will include traffic jams and inconvenience to the public passing through the Project Area. The movement of vehicles along the haulage routes will cause soil erosion, debris flow, dust emissions etc.	• Movement of vehicles will be restricted during the daytime; • Construction vehicles, machinery and equipment will be parked at designated areas to avoid un-necessary congestions along the major roads; • Speed of the vehicles will be controlled to reduce the probability of severe accidents, soil erosion, debris flows due to vibrations and dust emission; • Traffic Management Plan will be implemented to avoid traffic accidents, jams/public inconvenience.	• Vehicle maintenance record • Training record • Implementation of TMP • Regular visual observations	CC	Proponent
6.	**Community Health and Safety** The construction activities and vehicular movement at construction sites may result in roadside accidents deteriorate quality of groundwater and surface water resources, cause air/dust emissions, noise pollution, vibrational impact and spread of different transmittable diseases due to outside labour	Proper control on construction activities, restrict entry of labors with different transmittable diseases, adopt mitigations for dust, noise & vibration impacts and create awareness about road safety will be ensured. Mitigations mentioned in section 6.6.2.6 will be adopted.	• Implementation of HSE Plan • Use of PPEs • Community concerns record • Medical reports of worker	CC	Proponent
7.	**Occupational Health and Safety** Occurrence of accidents / incidents during the construction stage is a common phenomenon and workers as well as locals will	Safety precautions for the construction workers, Training of workers in construction safety procedures and use of Personnel Protective Equipment (PPE) will mitigate this impact. Mitigations mentioned in section 6.6.2.7 will be adopted.	• Implementation of HSE Plan • Use of PPEs • Training Records • Work permits	CC	Proponent

Sr. No	Impacts	Mitigation Measure	Performance Monitoring Indicators	Responsibility	
				Implementation	Monitoring
	be more prone to serious accidents.		• Implementation of Emergency response plan and disaster management plan in case of natural disaster occurrence		
8.	**Soil Erosion** Construction activities such as clearing and grubbing, excavation, filling, laying down concrete foundation for Towers and setting up construction camps will affect the existing soil condition in the CoI. Soil erosion may also occur in the workshop areas as a result of improper drainage system of equipment washing-yards and improper management of construction activities.	Good engineering practices will help to control or minimize the soil erosion both at the construction sites and in peripheral areas. All the disturbed areas need to be protected against soil erosion by stripping and stockpiling of all the available topsoil for later re-vegetation. Special slope protection measures will be adopted in the sensitive areas i.e. protected forests. Site restoration plan for the Project will be strictly followed.	• Visual observation and photographic record • Site restoration and rehabilitation plan implementation	CC	Proponent
9.	**Soil Contamination** Land may be contaminated due to the spillage of chemicals, fuels, solvents, oils, paints, concrete, solid waste generated at campsites etc. This normally happens when these materials are transported in open or loosely capped containers. The possible contamination of soil by oils and chemicals at camp sites, workshop area and	The following practice will be adopted to minimize the risk of soil contamination: • The Contractors will be required to instruct and train their workforce in the storage handling and management of materials and chemicals that can potentially cause soil contamination; • Material Safety Data Sheets (MSDS) will be strictly followed during handling and storage of chemicals; • Soil contamination due to concrete transportation will be minimized by placing all containers in casings; and • Solid waste generated at the camp sites will be properly treated and safely disposed only in the	• Visual observation and photographic record • Waste Management plan implementation	CC	Proponent

Sr. No	Impacts	Mitigation Measure	Performance Monitoring Indicators	Responsibility	
				Implementation	Monitoring
	equipment washing-yards may limit the future use of land for agricultural purposes.	demarcated waste disposal sites/areas.			
10.	**Wastewater Generation at Construction Camps** Wastewater will be generated at the construction camps (total 06 in Nos.) and from construction activities. Based on the estimated, 1,984 liters/day wastewater will be generated from a camp during the construction phase which may affect water bodies if disposed off without proper treatment.	To dispose the liquid waste generated from the construction activities, the following steps will be taken by the Contractor: • Domestic and chemical effluents from the construction camp will be disposed by the development of on-site sanitation systems i.e. septic tanks (as shown in **Figure 6-9**). Proper monitoring to check the compliance of NEQS and PEQS will be carried out; and • Sewage from construction camps will be disposed of after proper pre-treatment and processes such as soakage pit.	• Visual observation • Regular environmental monitoring, sampling and testing reports • Waste Management plan implementation	CC	Proponent
11.	**Solid Waste Generation at Construction Camps** Considering the labourers (about 62 Nos.) residing in the construction camp and the locally available labour, a total of about 31 kg of solid waste will be generated from the construction camp daily. The major components of the labour camp waste will be garbage, putrescible waste, rubbish and small portion of ashes and residues. Other type of wastes may include inorganic construction wastes.	• All the solid waste from the camps will be properly collected at source and disposed of through proper solid waste management system. The Contractor will coordinate with local representatives and administration concerned department for the disposal of solid waste; • The concerned department must develop a plan of action for transporting the waste to the disposal site for final disposal. It is the responsibility of the concerned department to ensure that the disposal site is properly lined to prevent the leachate from contaminating the groundwater; • Secondly, the disposal site must be located away as far as practical from populated areas and regions that have a high density of Wildlife;	• Visual observation and photographic record. • Waste Management plan implementation	CC	Proponent

Sr. No	Impacts	Mitigation Measure	Performance Monitoring Indicators	Responsibility	
				Implementation	Monitoring
		• Toxic waste will be handled, stored, transported and disposed separately; • The waste will be properly sealed in containers with proper labels indicating the nature of the waste; and • Solid waste will be segregated at source so that it can be re-used or recycled.			
12.	**Waste Generation at Construction Site** The construction waste will include wastewater, oil spillage from machinery and solid waste (damaged or spoiled materials, temporary and expendable construction materials etc.). The handling and storage of oil and other hazardous waste will be a source of environmental pollution during the excavation and foundation activities at tower spotting locations.	Waste Management Plan will be developed to implement an efficient and responsive solid waste management system during construction phase.	• Visual observation and photographic record. • Waste Management plan implementation	CC	Proponent
13.	**Impact on Water Resources** Surface water resources may get contaminated by the fuel and chemical spills, or by solid waste and effluents generated by the kitchens and toilets at the construction camp sites. Moreover, runoff from the chemical storage areas may also contaminate the surface water bodies. This impact can be categorized as direct, moderate, local, medium term, temporary, high probability and reversible.	As a mandatory step, all the effluents will be disposed as per the requirements of NEQS and PEQS. Moreover, to reduce the risk of surface and groundwater contamination, good management practices will be adopted to ensure that fuels, chemicals, raw sewage and wastewater effluent are disposed of in a controlled manner.	• Visual observation • Regular environmental monitoring, sampling and testing reports • Waste Management plan implementation	CC	Proponent

Sr. No	Impacts	Mitigation Measure	Performance Monitoring Indicators	Responsibility	
				Implementation	Monitoring
14.	**Nullahs and River Crossing** The proposed T/L will also cross the Nulllahs at different locations (Refer Chapter). Crossing of Nullah will not have any significant adverse impact on environment during the stringing action stage.	No specific mitigation measure can be suggested for this impact. However, contamination of the water bodies needs to be avoided during construction. Moreover, it is suggested that no Tower footings are to be spotted in Nullah beds.	• Visual observation • Regular environmental monitoring, sampling and testing reports • Waste Management plan implementation	CC	Proponent
15.	**Power T/Ls Crossing** Proposed T/Ls from Sangal to Maira crosses various high voltage existing T/Ls. The details are provided in Chapter-6. Crossing may be dangerous during the stringing action and operation stage, if proper clearance is not provided at the design stage of the Project.	Special care is required during the construction of Towers as well as stringing of conductors. During the stringing of conductors, temporary shutdown of the existing T/Ls will be ensured to safeguard the workers and the surroundings. A proactive coordination is required between the construction staff and relevant Grid Station operation staff to ensure the shutdown schedule.	• Work order issuance after prior meeting and issuance of shutdown notification from the nearest Grid Station • HSE Plan implementation	CC	Proponent
16.	**Ambient Air Quality** Airborne dust from access road construction and use, wind erosion of material stockpiles, emissions from diesel jeeps and construction equipment, disposal of waste have potential to adverse impact sensitive receptors in the Project area.	The following effective measures need to be adopted for controlling the potential adverse impacts on ambient air quality: • The existing quarries will be used to borrow the aggregate materials; • Concrete batching plants will be equipped with dust control equipment such as fabric filters or wet scrubbers (as shown in Chapter 6) to reduce the level of dust emissions; • Ensure the proper and periodic tuning of the vehicles; • Dust emissions from trucks will be reduced by a regular sprinkling of water for keeping the dust settled at least twice a day;	• Visual observation • Regular environmental monitoring, sampling and testing reports • Vehicle maintenance records • Water sprinkling records.	CC	Proponent

Sr. No	Impacts	Mitigation Measure	Performance Monitoring Indicators	Responsibility	
				Implementation	Monitoring
		• Haul-trucks carrying sand aggregate and other materials will be kept covered with tarpaulin to reduce the dust pollution; • Turn off the engines for all vehicles, while parked on the site; • NTDC will set up a system to monitor the air quality along the Project corridor and NEQS and PEQS provisions for ambient air quality, stack emission, noise levels and vehicular exhaust will be used for reference during the construction works.			
17.	**Noise Level** Noise generated by the construction machinery during the construction stage is likely to affect the CoI particularly the sensitive receptors like nearby schools, houses and Settlements etc.	• Fitting all powered mechanical equipment and machinery with noise abating gear, such as mufflers for effectively reducing sound; • Properly tuned vehicles and oiling of moving part of equipment may also reduce the noise levels. Construction timing will be coordinated with locals. Normally noise generating activities are allowed from 9 AM to 5 PM during day time to avoid disturbance to humans as well as fauna; • Using well-maintained haulage trucks with speed controls; and • NTDC will also set up a system to monitor the noise levels in the CoI near the construction activities to facilitate the concerned EPAs in enforcing the noise standards as prescribed in the NEQS and PEQS.	• Physical observation • Regular environmental monitoring, sampling and testing reports • Vehicle maintenance records	CC	Proponent
18.	**Greenhouse Gases (GHGs) Emissions** Due to reduction in baseline tree, the CO_2 sequestration will be reduced from +52 tCO_2e to -188 tCO2e in next four (04) years. 368 tCO_2e per year GHG emission will be increased due to vehicle and machinery used. Considering a	Plantation development as per the tree plantation/reforestation plan is highly recommended for the sequestration of CO_2 and vehicle maintenance protocol mentioned in Section 6.7.2.18 will be adopted	• Regular environmental monitoring, sampling and testing reports • Vehicle maintenance records	CC	Proponent

Sr. No	Impacts	Mitigation Measure	Performance Monitoring Indicators	Responsibility	
				Implementation	Monitoring
	cumulative impact, the net CO_2 elimination from atmosphere will be further reduced during the construction up to the extreme minimum value of -812.83 tCO_2e.		• Platation Plan Implementation Record.		
19.	**Impacts on Fauna** Construction activities will have adverse impacts on the wild animals. Some might be killed and other might be migrated to safer place due to fear of hunting, trapping and killing. Moreover, huge noise due to the construction activities can also disturb the wild animals. Some reptiles will be more affected during the construction works. On completion of huge plantation in the area, the distracted or the feared wild animals which were escaped due to noise will come back due to establishment of new plantation.	• Noise will be avoided as much as possible especially during the breeding season by using those equipment creating less noise and avoid blasting. • All the camps will be properly fenced to avoid any disturbance; and • All the workers will be warned not to do illegal poaching, trading, trapping, catching and killing of animals and birds and give them knowledge about the relevant government regulations and punishments regarding such types of acts.	• Visual observation and photographic record • Regular departmental and community consultation record (Minutes of meeting)	CC	Proponent
20.	**Impacts on Avifauna/ Birds** Cutting of forest trees compelled the birds to fly away due to the huge noise of construction machinery. Moreover, dust emissions, exhaust emissions (cause air pollution), trash and stored materials, soil compaction (affect grassland birds that feed on	• Entrance to sensitive areas during critical periods of migration, breeding and feeding of birds will be prohibited; and • Last but not the least, Ecologist expert will accompany with the installation team at the time of installation of pole tower in order to ensure to identify those trees of high value regarding trees of large foliage which is suitable for wildlife and avifauna habitat.	• Visual observation and photographic record • Regular departmental and community consultation record (Minutes of meeting)	CC	Proponent

Sr. No	Impacts	Mitigation Measure	Performance Monitoring Indicators	Responsibility	
				Implementation	Monitoring
	invertebrates by reducing prey abundance in the area), drainage alteration, siltation, removal of vegetation, noxious weeds and fires in the forest				
21.	**Impact on National Parks** The proposed T/L potentially passes at the edges of the following National Parks. ▪ Murree, Kotli Sattian, Kahuta National Park (Punjab)	Apart from the mitigation measures for other flora, fauna and avi-fauna species, the specific measures mentioned in Chapter 6 will be adopted.	• NOC from concerned department prior to start working • Visual observation and photographic record • Regular departmental record during work in these areas (Minutes of meeting)	CC	Proponent
22.	**Aquatics and Wetlands** No major impacts on aquatics and wetlands are observed during the survey along the T/L route of the project area.	No Mitigation Required	Not Required	CC	Proponent
23.	**Conflict over Water Resources** In the RoW of T/L; availability of water is an issue and use of water from the available resources, may cause conflicts between the locals and the Contractors. This impact can be categorized as direct, low, local, short term, temporary, low probability and reversible.	• In areas of concern, the water will be provided through vehicles from the nearby Nullah or springs; • The camps will be located at least 500 m away from the nearest local settlements to prevent the contamination of community-owned water resources; • Formal approval will be obtained before using the local surface water resources such as nearby Nullah and Kunhar River water;	• Physical observation and photographic record • Regular stakeholder consultation record (Minutes of meeting)	CC	Proponent

Sr. No	Impacts	Mitigation Measure	Performance Monitoring Indicators	Responsibility	
				Implementation	Monitoring
		• The Contractors will be required to maintain close liaison with the local communities to ensure that any potential conflicts relating to the common resource utilization are resolved quickly; and • Guidelines will be established to minimize the wastage of water.			
24.	**Impacts on Local Communities/Workforce** • The movement of the Towers and conductors from the stocking area to the construction site may cause traffic problems on the road for the locals. This will have low adverse impact on the locals on temporarily basis; • Induction of outside workers by the Contractor may cause conflicts with the locals on the cultural issues related to social and gender. This is a medium adverse social impact of temporary nature; • Theft problems to the community by the Contractor's workers and vice versa may also create social issues. • During the construction stage, noise and dust problems will affect the health of the locals in nearby populated areas. • During the construction stage,	• Mobility of the workers in the nearby areas will be strictly restricted to avoid any inconvenience. • The Contractor will select specific timings for stringing so as to cause least disturbance to the local population. • Contractor will take care of the concerns of the local community and the sensitivity towards the local customs; • Good relations with the local communities will be promoted by encouraging the Contractor to provide opportunities for skilled and unskilled employment to the locals. • The Contractor will warn the workers not to indulge in any theft activities. • Similarly, at the time of employing, the Contractor has to take care that the workers will be of good repute. • Use of good engineering practices will be adopted to avoid inconvenience to the locals due to noise, smoke and fugitive dust; • Proper arrangements to ensure that the mobility of locals will not be disturbed; • A proper traffic management plan will be prepared to avoid accidents with the help of Traffic Police; • The Contractor will take due care related to the disposal of construction materials as well as solid waste disposal;	• Physical observation and photographic record • Regular stakeholder consultation record (Minutes of meeting)	CC	Proponent

Sr. No	Impacts	Mitigation Measure	Performance Monitoring Indicators	Responsibility	
				Implementation	Monitoring
	improper traffic management can create problems of traffic flow and accidents. • Improper arrangement of the disposal of construction materials may create problems. • Relocation/disturbance to the existing utilities like electric poles, telephone poles, etc. may affect the routine life of the community. • Slippage of the Contractor's staff while working at steep hill slopes may occur. • Overall these impacts can be categorized as direct, moderate, local, medium term, temporary, high probability and reversible.	• The Contractor will ensure that the water resources will not be contaminated or destroyed; • Blasting will be avoided near the settlements, and if unavoidable, it will be carried out during the fixed hours; • Safety lookouts will be built to prevent people and vehicles from passing at the time of blasting; • The management and use of blasting materials will be in strict conformity with the safety requirements; • Haul-trucks carrying concrete, aggregate and sand fill materials will be kept covered with tarpaulin; and • In construction camps, amenities of life including clean food, water and sanitation facilities will be provided.			
25.	**Gender Issues** • As the Project route is passing through the rural areas of Abbottabad and these areas women activities in the field may become affected due to the construction activities; • The rural women in few areas of KPK normally use the open field latrines and their privacy may suffer due to the Project activities; • Similarly, in Punjab, the route is passing through	• The Contractor have to select the specific timings for the construction activities so as to cause least disturbance to particularly women considering their routine movement hours; • The Contractor have to carry out the construction activities in such a way that the open field latrine usage timings by the local community particularly women, will not be affected; • Contractor will warn the staff strictly not to involve in any un-ethical activities such as theft, prostitution and to obey the local norms and cultural restrictions; and • While working on the erection of Towers, if privacy	• Physical observation and photographic record • Regular stakeholder consultation record (Minutes of meeting)	CC	Proponent

Sr. No	Impacts	Mitigation Measure	Performance Monitoring Indicators	Responsibility	
				Implementation	Monitoring
	mostly the rural areas in Kahuta, Kotli Sattiyan, Murree, Gojar Khan and Rawalpindi tehsils of Rawalpindi district Punjab province, outdoor women activities in the field may be affected due to the construction activities; • Most of the T/L cross the settlement of rural areas due to privacy of the local women will be disturbed due to outside workers; and • This impact can be categorized as direct, moderate, local, medium term, temporary, high probability and reversible.	of the nearby households is affected, the Contractor will inform the house owner to make some arrangements.			
26.	**Loss of Income** • During the construction activities, people will suffer loss in their annual income due to the loss of crops, trees etc.; • The restriction of plantation of trees above 2.5 m height during the operation stage may also cause the inconvenience to the locals; • Due to the erection of towers and the passing of T/L, the value of land may decrease on long-term basis; and • This impact can be categorized as indirect,	• Fair, prompt and negotiated compensation for the crops and trees on private land will be provided to the affectees; • Affectees will be involved in the valuation process at all stages of the Project; and • Since the erection of towers will involve very limited amount of land and the land under the towers and conductors can be easily used for crops, therefore any significant depreciation in the land value is not foreseen.	• Physical observation and photographic record • Regular stakeholder consultation record (Minutes of meeting)	CC	Proponent

Sr. No	Impacts	Mitigation Measure	Performance Monitoring Indicators	Responsibility	
				Implementation	Monitoring
	moderate, local, medium term, permanent, highly probable and irreversible.				
27.	**Relocation of Private/Public Infrastructure** This impact can be categorized as direct, low, site-specific, long term, temporary, low probability and reversible. About 50 structures fall in the RoW which may be impacted due to the proposed project.	• In order to mitigate or compensate the impact of land acquisition and resettlement, RP needs to be prepared; • Utmost efforts will be made to minimize the relocation/damage to infrastructure especially houses (if any); and • No relocation of settlements (group of people) will be involved as the Project has flexibility to change the alignment. • In case, the re-alignment of tower will not be possible, full market price of any equipment (non-moveable) and cost of reconstruction including labour charges will be paid to the affectees.	• Physical observation and photographic record • Regular stakeholder consultation record (Minutes of meeting)	CC	Proponent
28.	**Religious, Cultural and Historical Sites and Other Sensitive Receptors** There are no notified religious, cultural, historical sites and other sensitive receptors exist in the proposed T/L CoI and RoW. This impact can be categorized as negligible. Low level dust emission and noise pollution impact is foreseen on these sites.	• No religious and cultural sites like *mazars*/shrines, graveyards, community centre etc. will be affected due to the implementation of the proposed Project; and • Any notified archaeological site is also not located within the Project corridor; therefore, no impact on any archaeological site is envisaged. • Mitigations for the control of dust emission and noise pollution (mentioned in sub-section 6.6.2.14 and 6.6.2.15) shall be adopted.	• Physical observation and photographic record • Regular stakeholder consultation record (Minutes of meeting) • NOC from Archaeology department if any archaeological site	CC	Proponent

Sr. No	Impacts	Mitigation Measure	Performance Monitoring Indicators	Responsibility	
				Implementation	Monitoring
			is identified.		
29.	**Indigenous People, Vulnerable and Women Headed Households** • No indigenous group of people was identified, which comes under the definition of the "Indigenous People". So, no impact on the indigenous people is envisaged due to the implementation of the Project; • During baseline survey it was identified that, T/L also crosses some houses of vulnerable people (who fall below the poverty line) in few areas. Income of these vulnerable groups may be affected; • No women headed household was identified during the social survey of the Project, therefore, no special measures are recommended; and • This impact can be categorized as direct, moderate, local, medium term, temporary, high probability and reversible.	• As referred earlier, no indigenous people have been identified in or along the Project corridor, so no mitigation is required; • The vulnerable persons (if any) shall be provided with all possible assistance and help for acquiring the skills and preference will be given to them for employment; • As referred earlier, no women headed household has been identified during the social field survey. So no mitigation is proposed; and • At some location efforts are being made to avoid the houses by adjusting Towers locations.	• Physical observation and photographic record • Regular stakeholder consultation record (Minutes of meeting)	CC	Proponent

1.9 Environmental Monitoring Plan

Environmental monitoring provides timely and useful information to the project management and implementation agencies. Conceptually, “monitoring” means to check and balance, on a regular basis, the status of the project activities and realization of various developmental targets during construction phase. It helps in timely identification/analysis and removal of the bottlenecks and expedites actions. Certain environmental parameters (physical, ecological and social) are selected and quantitative analysis is carried out. The results of analysis are compared with the guidelines; standards and pre-project condition to investigate whether the EMP and its implementation are effective for the mitigation of impacts or not. The objectives of environmental monitoring plan during the construction phase will be as follows:

- Monitor the actual project impacts on physical, ecological and socio-economic receptors;
- Recommend mitigation measures for any unforeseen impact or where the impact level exceeds the anticipated level in the EIA;
- Ensure compliance with legal and community obligations including safety during construction phase;
- Ensure the safe disposal of excess construction materials, solid waste, water and wastewater and gaseous emissions;
- Appraise the adequacy of the EIA with respect to the project’s predicted long-term impacts on the area’s physical, ecological and socio-economic environment;
- Evaluate the effectiveness of the mitigation measures proposed in the EMP and recommend improvements in EMP, if required; and
- Compile periodic incidents/accidents data to support analyses that will help to minimize future risks.

1.9.1 Monitoring Strategy

Under the proposed monitoring strategy, it is recommended that NTDC will be responsible for all the monitoring activities. All the findings and results in the form of monitoring report will be finally shared with KP- EPA and Punjab EPA. The monitoring program has been designed carefully considering the identified impacts and some additions or deletions probably in frequency may be taken up. **Table 2.2** provides environmental monitoring schedule for construction stage of the proposed T/L.

Table 2.2: Environmental Monitoring Plan

Sr. No.	Receptor	Monitoring Parameters / Performance Indicator	Location	Monitoring Mechanism	Monitoring and Reporting Frequency
1	Water Resources/ Water Quality	Compliance with all parameters as per NEQS 2000 and PEQS 2016 for wastewater.	Proposed T/L Route. ~ Major receptor i.e. Jhelum rivers, Springs, residential areas etc. within the RoW of the Proposed T/L. However,	Visual checks of laboratory activities Discrete grab sampling and laboratory testing of water samples by EPA approved Laboratory for monitoring.	Once before the start of construction by activity monitors and reported On quarterly basis during the construction Bi-annually for at least one year during defect liability period.

Sr. No.	Receptor	Monitoring Parameters / Performance Indicator	Location	Monitoring Mechanism	Monitoring and Reporting Frequency
			estimated sampling points are twenty 20) which will be verified at construction stage. Other proposed effluent discharge points are: ~ Contractors camps ~ Concrete preparation plants ~ Fuel (Petrol. Oil and Grease) products storages. ~ Vehicle and machines repairing and servicing yards.		
2	Soil Contamination	Soil contamination, uncontrolled solid waste disposal activities at sites.	Proposed T/L Route. ~ Tower sites with severe contaminati on. Other proposed sampling sites are: ~ Constructio n Camp. ~ Equipment washing yards. ~ Spillage points of fuel, chemicals and	Visual observations and checks of laboratory activities Sampling and laboratory testing for soil samples.	Once before the start of construction by activity monitors and reported On quarterly basis during the construction Bi-annually for at least one year during defect liability period.

Sr. No.	Receptor	Monitoring Parameters / Performance Indicator	Location	Monitoring Mechanism	Monitoring and Reporting Frequency
			lubricants.		
3	Land Resources	Landuse change from agriculture to residential and commercial.	Surrounding areas of Converter Station Proposed T/L Route. ~ Towers Sites with significant landuse change.	Random visits and visual observations of landuse change.	Once before the start of construction by activity monitors and reported On Monthly basis during the construction Bi-annually for at least one year during defect liability period.
4	Dust Emissions	Compliance with PM_{10} $PM_{2.5}$ per NEQS 2010 and PEQS 2016	Proposed T/L Route. ~ Sensitive receptors within the RoW of the proposed T/L close to the access roads. Estimated sampling points are twenty (20) which will be verified during construction stage.	Visual checks of laboratory activities Onsite Ambient Air Monitoring equipments	Once before the start of construction by activity monitors and reported On quarterly basis during the construction Bi-annually for at least one year during defect liability period.
5	Noise Pollution	Compliance with dBA Leq. as per NEQS 2010 and PEQS 2016	Proposed T/L Route ~ Sensitive receptors within the RoW of the proposed T/L close to the access roads. Estimated sampling points are twenty (20) which will be verified during	Visual checks of laboratory activities Monitoring of noise level at site.	Once before the start of construction by activity monitors and reported On quarterly basis during the construction Bi-annually for at least one year during defect liability period.

Sr. No.	Receptor	Monitoring Parameters / Performance Indicator	Location	Monitoring Mechanism	Monitoring and Reporting Frequency
			construction stage. Other proposed sampling sites are: ~ Construction camps. ~ Equipment yards.		
6	Fumes and gases	Monitoring of CO, CO_2, SOx, NO_x, HC and $PM_{2.5}PM_{10}$ and compliance with NEQS 2010 and PEQS 2016. Vehicular emissions as per NEQS 2009 and PEQS 2016	Proposed T/L Route ~ Major receptors within the RoW of the proposed T/L close to the access roads. Estimated sampling points are twenty (20) which will be verified during construction stage. Emissions from the silencers of heavy machinery, trucks and other vehicles.	Visual checks of laboratory activities Onsite monitoring of ambient air quality will be preferred.	Once before the start of construction by activity monitors and reported On quarterly basis during the construction Bi-annually for at least one year during defect liability period.
7	Ecological Resources	Disturbance to natural habitat, uncontrolled floral cutting which can be avoidable.	Proposed T/L Route ~ Natural habitats along the RoW of the proposed T/L (i.e. Guzara and Reserve Forests).	Visual checks to ensure that only marked trees are cut within the Project corridor. Monitoring of Wildlife / birds hunting.	Once prior to the start of construction Monitoring and reporting on monthly basis during the construction stage. Bi-annual monitoring and reporting during the operation stage.
8	Houses and Animal Sheds	Disturbance and removal avoidable of houses, animal	Proposed T/L Route ~ Houses, animal	Random visits and consultations with AP's.	Prior to the start of construction. Reporting will be done on the basis of

Sr. No.	Receptor	Monitoring Parameters / Performance Indicator	Location	Monitoring Mechanism	Monitoring and Reporting Frequency
		sheds etc. which are within the Project corridor.	sheds within the RoW of the proposed T/L. These structures will be verified prior to the start of construction.		RP recommendation.
9	Public Infrastructure	Disturbance or damage to public infrastructure	Proposed T/L Route Public infrastructures within the RoW of proposed T/L. These structures will be verified prior to the start of construction.	Random visits and consultations with AP's.	Prior to the start of construction. Reporting will be done on the basis of RP recommendation.
10	Community around the Project corridor	Use of common resources. Hindrance to mobility. Community health and safety	- Communities within the RoW of the proposed T/L	community consultations.	Prior to the start of construction and during the construction stage. Reporting will be done on the basis of RP recommendation.

1.10 Planning for EMP Implementation

1.10.1 NOC and Other Approvals

EPA Approval Process

The EIA report duly reconciled with NTDC is to be submitted to Punjab and KP-EPA for obtaining NOC. A demand draft of required EIA review fee has to be deposited along with the report by the Proponent to Punjab and KP-EPA for initiating the review and EIA approval process. The approval from Punjab and KP-EPA is the mandatory requirement before commencement of the proposed Project activities.

Provincial Departments of Wildlife, Forest and Archaeology

At the feasibility stage of the Project as per the requirement of EPA guidelines for the Sensitive and Critical Areas, concerned provincial departments are informed through letters for the proposed T/L project.

During the construction stage, if the implementation of the proposed Project involves the clearing of vegetation and trees which belongs to the forest or wildlife department, the Project Contractor will be responsible for acquiring a No Objection Certificate (NOC) from the concerned provincial forest department. The application for an NOC will need to be endorsed by NTDC. Similarly, if any Archaeological monument or site is crossed by the proposed T/L concerned provincial department needs to be contacted for NOC.

Where construction is to be carried out in the close proximity of the protected forests and Wildlife and Archaeology sites, the NTDC is required to coordinate with the concerned departments to ensure that the impacts on vegetation and wildlife are minimized. The Contractor is also required to contact with concerned department before the start of the construction work.

Provincial Revenue Departments

Under the national law, matters relating to the land-use and ownership are the provincial subjects and the revenue department of the concerned province is empowered to carry out the acquisition of private land or built-up property for public purposes, including on behalf of other provinces. For this purpose, the concerned department must lodge an application with the concerned provincial government to depute a Land Acquisition Collector (LAC) and other revenue staff, who will be responsible for handling the matters related to the acquisition and disbursement of compensation.

1.10.2 Stakeholder Coordination

Notwithstanding the efforts so far put in for public participation, this activity will have to be pursued through the forthcoming implementation phases of the Project. In particular, the focus will be on the improvement and modification of the proposed intervention designs.

Participation mechanisms facilitate the consultative process and include information sharing and dissemination, disclosure, and participation of affected people and other stakeholders in the proposed Project related activities. In the peculiar social set-up of the Project Area, it is also important to involve the religious leaders as representatives of the public as well as part of effective communication process. They can provide a very effective medium to bring information to the affected male population through Friday prayers. Local business community, especially the affected one, should also be brought into the process of awareness and participation.

The related institutional arrangements should also be in place for continuous consultation throughout the process of planning and implementation. During construction, ESIC of NTDC will have to implement both EMP and RP

1.11 Training and Capacity Building

To enhance the capacity of the Proponent as well as the Contractor, training will be imparted related to the environmental and social issues of the proposed Project, implementation of mitigation measures and the monitoring protocols and reporting mechanism will also be carried out.

In-house training for the project staff including contractor and the supervisory staff (PMC/FMC for Environment & Resettlement Aspects) of the Proponent will be ensured through the provision of one day basic training and one day advanced training, covering environmental and social aspects of the development projects in general, and implementation requirements with emphasis on the roles and responsibilities of the proponent and the contractor staff while executing the environmental management and monitoring plan in particular. The training protocols will include the following aspects:

- Procedures for monitoring the air quality parameters and measures to be adopted for avoiding or minimizing air pollution, particularly from the concrete batching plant, haul-trucks, etc.;
- Procedures for monitoring water quality parameters and measures to be adopted for avoiding or minimizing water pollution, particularly from the wastewater effluent generated from the workshops, machinery washing yards, and other obnoxious chemicals;
- Safe waste management and disposal practices;
- Safe noise levels from the construction machinery etc.;
- General housekeeping and cleanliness;
- Communicable diseases;
- Safety measures against hazards for workforce and the local communities arising from the construction activities; and
- Use of safety gadgets by the workforce.

A comprehensive training manual will be developed and implemented by the Contractor with prior consent of PMC/FMC and ESIC-NTDC.

1.12 Communication & Documentation

Communication and documentation is an essential feature of EMP. The key features of such mechanism are:

1.12.1 Data Recording and Maintenance

All forms to be used for recording information during the environmental monitoring will follow a standard format which will correspond to the data base in to which all the gathered information will be placed. Check boxes will be used as much as possible to facilitate data entry. Tracking system will be developed for each form.

1.12.2 Database

The database may include the following information:

- Training programs;
- Staff deployment;
- Non-compliances;
- Corrective actions
- List of environmental data; and
- List of environmental data to be maintained:
  - Soil and land pollution;
  - Disposal of waste;
  - Water resources ;
  - Fuel oil and chemical spills;
  - Vegetation record;
  - Noise pollution;
  - Air and dust pollution;
  - Socio-economic data; and
  - Ecological sensitivities.

1.12.3 Meetings and Reporting

Monthly meetings will be held at site during the construction phase. The purpose of these meetings will be to discuss the routine activities, non-compliances and their remedial measures. Various reports will also be produced at periodic time intervals, as provided in **Table 2.3** along with information regarding persons responsible for report preparation and review process. Additionally, minutes of meeting will also be submitted as part of routine environmental reports.

Table 2.3: Periodic Reporting Mechanism

Sr. No.	Report Category	Prepared by	Reviewed by	Aprroved by
1	Monthly	Contractors' environmental staff	SC	ESIC-NTDC
2	Quarterly	Contractors' environmental staff	SC	ESIC-NTDC
3	Semi-Annual Environmental Monitoring Report (SAEMR)	Construction Supervision Entity	SC	ESIC-NTDC
4	Annual Report	Contractors' environmental staff	SC	ESIC-NTDC
5	Completion Report	Contractors' environmental staff	SC	ESIC-NTDC

1.12.4 Social Complaint Register

The Contractor will maintain a register of complaints record from local communities and measures taken to mitigate these concerns.

1.12.5 Photographic Records

Contractors will maintain photographic records during the implementation of the proposed Project. As a minimum, the photographic records will include the site photographs, all the roads, camp sites and monitoring activities, etc.

1.12.6 Non-Compliance of the EMP

The implementation of the proposed EMP involves inputs from various functionaries. The Contractor will be primarily responsible for ensuring implementation of the mitigation measures proposed in the EIA including EMP and Environmental Permit from Punjab and KP-EPA, which will be part of the contract documents. The provision of the environmental mitigation cost will be made in the total cost of Project, for which the Contractor will be paid on the basis of monthly compliance reports. However, if the Contractor fails to comply with the implementation of EIA including EMP and Environmental Permit from Punjab and KP-EPA and submission of the monthly compliance reports, deductions will be made from the payments to the Contractor claimed under the heads of environmental components.

1.12.7 Review of Recorded Data

All the data and communication recorded and maintained by the Contractor will be periodically review and checked by ESIC-NTDC and necessary action will be recommended to Contractor to improve the receding and documentation.

1.13 Management Plans

Various management plans have been prepared as a part of EMP for the better management and implementation of EMP during all phases of the proposed Project. However, these plans will be updated by Contractor and approval from NTDC should be sought before start of construction activities. These plans are listed below:

1) Tree Plantation / Reforestation Plan;
2) Health, Safety and Environment (HSE) Management Plan;
3) Emergency Preparedness and Response Plan;
4) Restoration and Rehabilitation Plan;
5) Waste Management Plan;
6) Disaster Management Plan;
7) Drinking Water Supply and Sanitation Plan
8) Traffic Management Plan; and
9) Change Management Plan.

1.13.1 Tree Plantation / Reforestation Plan

The basic purpose of reforestation/afforestation/plantation of suitable species in the project area is to reduce the risk been made due to cutting of trees for the proposed project and to enhance green cover and improve the overall environment of the area. Reforestation will not only reduce the risk been made but will also increase the carrying capacity of the area regarding many positive aspects.

Afforestation will be done in those areas in which there is low forest cover or in areas which have been clearly felled and leave barren. Afforestation is highly important to maintain the biodiversity and ecological balances. It is also important to prevent global warming, soil erosion and pollution. Afforestation purifies the environment and helps in reducing the carbon dioxide level. Along with the importance of T/L to the local communities, the afforestation activity will further help in enhancing the socio-economic condition of the local communities. Based on the estimation, 22,720 number of trees/plants will be planted.

1.13.2 HSE Management Plan

Health risks and work safety problems may result at the workplace if the working conditions provide unsafe and/or unfavourable working environment due to storage, handling and transport of hazardous construction material. Workers should be provided with safe and healthy working environment taking into account risks inherent to the particular sector and specific classes of hazards in Project Area. During construction phase, Contractor will be responsible for all HSE related issues and to comply with national laws and international standards for occupational health and safety. Guideline for contractor's Occupational Health and Safety Plan is provided in the EIA Report. The ultimate goal of the plan is to eliminate any injury to human and damage to facilities, materials and the environment.

The following measures are identified for health, safety, and environment protection during all activities of the proposed Project to minimize risk of accidents, which could endanger the life of personnel, cause damage to properties and environment:

- All contractor staff shall be well informed and trained on the HSE policies and guidelines;
- Contractor shall provide adequate health services as well as site first aid services for its workforce;
- The main priority of the contractor shall be to prevent accidents during mobilization, construction phase of the proposed Project. Prevention of workplace accidents during the construction activities will be achieved using approved work plan/instructions by the supervisors;
- Work safety measures and good workmanship practices shall be followed by the contractor to ensure no health risks for workers;
- Provision of adequate sanitation, washing, cooking and dormitory facilities;
- Proper maintenance of facilities for workers shall be monitored;
- Provision of protective clothing for labourers handling hazardous materials, e.g. helmet, adequate footwear for bituminous pavement works, protective goggles, etc. and contractor will ensure strict use of wearing these protective clothing during work activities;
- Elaboration of a contingency planning by the contractor at work site in case of major accidents shall be carried out. A comprehensive emergency preparedness and response plan should be developed and implemented at site;
- A site-specific fire-fighting plan also needs to be developed and implemented by Contractor during construction phase;
- Accidents shall be reported to and investigated by the Contractor. All personnel shall be encouraged to report all accidents/incidents and to cooperate in the investigation of such occurrence. A comprehensive accident/incident report should be produced to NTDC for its review and necessary action;
- Adequate signage, lightning devices, barriers, and persons with flags during construction to manage traffic at haulage and access roads shall be conducted;

- The communicable disease of most concern during construction phase, like sexually-transmitted diseases such as HIV/AIDS, should be prevented by successful initiative typically involving health awareness, education initiatives, training heath workers in disease treatment, immunization program and providing health service;
- Reducing the impacts of vector borne diseases on long-term health effect of workers should be accomplished through implementation of diverse interventions aimed at eliminating the factors that lead to disease;
- All construction activities shall be properly managed through careful planning and the applicable and relevant HSE policies; and
- Prior approval from NTDC environment team should be sought before starting any construction related activity.

1.13.3 Emergency Preparedness and Response Plan

Emergency Preparedness and Response Plan provides an overview of the procedures to mitigate and control the impacts on community, on occupational health and safety, on the environment and on the Project in the event of emergency situations and to respond in life threatening situations usually occurring suddenly and unexpectedly during the construction phase of the proposed project. The guideline for Contractor's Emergency Preparedness and Response Plan is provided in the EIA Report.

1.13.4 Restoration and Rehabilitation Plan

The implementation of the proposed Project would involve construction workers' camp for staff and laborers, establishment of fences around construction site, over usage of access roads for movement of heavy machinery/motor vehicles linking to various components of project, offices, borrow/quarry areas, etc. During construction, these activities could also result in accumulation of large amount of unused or spoil material at various sites such as at access roads, muck dumping sites, quarry sites, colonies, offices, etc. which will change the existing land cover in the project area. After completion of the construction work, it is required to restore the disturbed area to its original conditions wherever it is possible that is the sole responsibility of the Contractor. Various engineering and biological measures have been suggested for the restoration of these areas:

- Top soil should be stored at designated areas before performing excavation activities at quarry sites (if these are agriculture land) and after the completion of all the construction activities, quarry sites (if applicable) and construction sites should be covered with the top soil to support the growth of plant species;
- The area should be planted with indigenous vegetation that would require the initial establishment of fast growing grasses along with annuals and perennials, nitrogen fixing herbaceous legumes and non-legume shrubs to increase the soil conditioning and to stabilize the project site;
- Material stockpiles shall be removed as soon as the construction work will be completed;
- All the construction, toxic and hazardous chemicals/materials shall be completely removed from the site;
- All fencing and gates shall be removed and pits shall be backfilled;
- The reconstruction of interrupted drainage channels and pipes shall be carried out;
- Rehabilitation of affected roads should be carried out to avoid any inconvenience to the road commuters; and
- A clearance certificate from the NTDC has to be taken by the Contractor in this regard.

1.13.5 Waste Management Plan

Management of solid and hazardous waste is one of the most important issues during construction phase of the Project. It is estimated that around 62 workers will be accommodated at each construction camp site (total of about 06 camp sites for T/L) during construction phase. As a general rule the water consumption will be about 20 gallon/capita/day (75.7

liter/capita/day) and will subsequently generate about 70 to 80% of this water as sewage. Based on this water consumption, around 4.7 m^3/day of water will be utilized for washing, cooking and bathing purposes at each camp site which will generate approximately 3.3-3.8 m^3/day sewage at each the construction camp sites. In addition to that each construction camp site will generate about 31 kg/day of solid waste at site @ 0.5 kg/capita/day.

The major components of the workers' camp waste are garbage, putrescible waste, rubbish and small portion of ashes and residues, wastewater from camps toilets and washing yards, etc. The construction waste will include wastewater, oil spillage from machinery and solid waste (damaged or spoiled materials, temporary and expendable construction materials, etc.). Insecure and unhygienic disposal of the wastes may cause degradation of soil, land and water resources. However, a criterion has been developed for the solid and hazardous waste management at site. The criterion for plan is as follows:

- All the anticipated solid wastes should be collected through a properly designed solid waste management system. Enough number of containers should be placed inside the camps and within the construction area for the collection of various types of waste;
- These containers will help the component separation of various types of waste at source. Classification will be based on organic waste, recyclable waste, reusable waste (for resource and recovery) and waste for disposal site. Based on the conditions of the region, organic waste should be frequently collected to avoid odor problems;
- Recyclable, reusable and waste for disposal site should be collected twice a week and on alternate days and should be transferred to a properly designed disposal site;
- The special strategy for safe handling, storage and use of hazardous substances/material should be developed and ensured at site;
- The sewage system for camps shall be properly designed (pit latrines or, as required, septic tanks) to receive all sanitary wastewaters;
- Lined wash areas shall be constructed within the camp site or at site, for the receipt of wash waters from construction machinery;
- Medical waste and construction waste should be handled with care.;
- The pesticide use shall not be allowed at site and for clearance of RoW;
- Construction waste i.e. waste concrete, bricks, cement, etc. should be disposed of at the designated areas; and
- Construction workers and supervisory staff should be encouraged and educated to practice waste minimization, reuse and recycling to reduce quantity of the waste for disposal.

Based on the above guidelines, Contractor(s) will be responsible for the preparation of Waste Management Plan before the commencement of construction activities and its implementation at site after the prior review and approval from SC and proponent.

1.13.6 Disaster Management Plan

A disaster is a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community 's or society 's ability to cope using its own resources. Disasters are of two types i.e, Natural and Manmade.

The flooding, earthquake, wind storms arethe major disastrous phenomena in the region. The mountainous terrain makes the community as well as worker more vulnerable to disasters. The development of poor infrastructural measures, poses greater vulnerability risk in relation

to the onset of potential disasters. In such cases, even a moderate disaster could bring devastating effects on communities.

The Provincial Disaster Management Authorities (PDMAs) of Government of Punjab and KP are mandated for planning, implementing and coordinating all activities in case of the onset of a disaster. Therefore, there is a specific requirement for developing a plan that effectively responds to any Monsoon induced emergency. PDMAs specialize in mitigation, preparedness and an organized response to a disaster. The most important role of PDMAs lie in providing a platform for all provincial departments to come together and strategize management and response to disasters and calamities.

1.13.7 Drinking Water Supply and Sanitation Plan

Separate water supply and sanitation provisions will be needed for the temporary facilities including offices, labor camps and workshops in order not to cause shortages and/or contamination. A Plan will be prepared by the Contractor on basis of the mitigation plans. The Plan will be submitted to the CSC for their review and approval before contractor mobilization.

1.13.8 Traffic Management Plan

A comprehensive Traffic Management Plan (TMP) will be developed by Contractor mentioning routes to be followed for transportation of construction machinery and materials e.g. cement, steel, gravels, sand, etc. A guideline accessibility map is shown in Chapter 3 and 5 of this EIA report. Traffic Management Plan will comprise following contents necessarily:

- Goals and objectives of plan;
- Purpose & Scope;
- Project specific traffic;
- Roles & responsibilities of contractors' environmental personnel;
- Routes to be followed along with necessary maps;
- Transportation timing; and
- Mechanism to address road accidents (if occurs).

Guideline for Contractor's TMP is provided in the EIA Report.

1.13.9 Change Management Plan

The present EIA has been carried out on the basis of the Project information available at this stage. It is however possible that the changes are made in some components of the Project during the design and construction phases. In order to address the environmental and social implications of these changes, a simple framework has been devised, which is described in this section. The change management framework recognizes the three broad categories (A, B & C) of the changes in the Project as detailed below:

Category 'A' Change: The 'Category A' change is one that will lead to a significant departure from the Project described in the EIA and consequently requires a reassessment of the environmental and socioeconomic impacts associated with the change. In such an instance, NTDC will be required to conduct a fresh EIA of the changed aspect of the Project design and send the updated report to the relevant agencies for approval. Some of the examples of category "A" changes are briefed below:

- Change in the T/L route by more than 10 km of the original alignment or a change in the route by less than 10 km, but the changed route has environmental and/or social sensitivity more than the original route. Increase in the T/L length exceeding 20 % of the original design, or increase in the length by less than 20% but involving areas which are more sensitive – environmentally and/or socially – than the original route.

Category 'B' Change: The Category 'B' change is one that will entail Project activities not significantly different from those described in the EIA, which may result in the Project effects with overall magnitude to be similar to the assessment made in this report. In case of such changes, the EIA will be required to reassess the environmental and socio-economic impacts

of the activity, specify additional mitigation measures, if necessary and report the changes to the relevant agencies (Contractors, EPAs). Examples of such changes are provided below.

- Changes in the T/L route by more than 500 m but less than 2Km of the original alignment or increase in the T/L length exceeding 10 % of the original design, but not exceeding 20%, provided that the extended route does not have environmental or social sensitivity.

Category 'C' Change: A Category 'C' change is one that is of little consequence to the EIA findings such as change in alignment less than 500 m. This type of change does not result in effects beyond those already assessed in the EIA; rather it may be made onsite to minimize the impact of an activity, such as re-aligning a particular section of the T/Ls to avoid cutting a tree, or relocating construction campsites to minimize clearing vegetation. The only actions required for such changes are informing all the key personnel and document the change.

1.14 Chance Find Procedure

The purpose of these guidelines is to address the possibility of archaeological deposits, finds and features becoming exposed during earth removing and ground altering activities associated with the Tower construction and to provide procedures to follow in the event of a chance archaeological find. The guidelines for chance find procedure of archaeological deposits is provided in the EIA Report.

1.15 Codes of Practice

The Contractor should seek to develop codes of practice for its staff and employees in order to ensure that the intrusion of workers in the Project Area does not result in any social and environmental and social issues between the workers and locals which can harm the Project by causing unnecessary delays.

These codes should be based on the principles of environmental protection, occupational health and safety, good engineering practices, respect, integrity and sound ethical values. Each code should include, at minimum, the purpose and objectives, a policy statement from the incharge explaining the importance of this code for the success of the Project, and examples of such conduct. Guidelines for the code of practices are discussed below.

1.15.1 General

General code of conduct should be developed for the Project and should include, at minimum, the following practices:

- Rules and guidelines will be given to the workers regarding the use of common resources such as wood, plants, water sources etc. to ensure their sustainable use;
- The code should also include provisions of the solid waste management plan to address solid waste collection and disposal in order to prevent unhygienic conditions and contamination of soil and water;
- The Contractor will made arrangements to avoid accidental risks such as traffic signs board and speed control measures for the safety of locals;
- In construction camps, amenities of life including clean food, water and sanitation facilities must be provided to these camps, and the workers should be provided with guidelines on how to dispose of their waste and maintain a sense of hygiene;
- The training of workers in the construction safety procedures, equipping all construction workers with Personnel Protective Equipment (PPEs) i.e. safety boots, helmets, gloves, ear plugs, and protective masks also and monitoring their proper and sustained usage;
- The Contractor should ensure that the construction labor is trained in safety procedures for all relevant aspects of construction;

- Formal emergency procedures should be developed for construction site in case of an accident. First Aid Kits and other necessary equipment should be kept available at site along with the list of emergency phone numbers at the construction site to be contacted in case of any accident; and
- The safety of the public at all stages of the construction phase will be ensured by appropriate public education and safety measures such as use of sign boards, barriers and flags and use of proper illumination at night.

1.15.2 Good Engineering Practices

Good engineering practices should be developed for the Project and should include, at minimum, the following practices;

- Standard Operating Procedures (SOP) for handling, storage and transportation of oil leakages, chemicals and other toxic materials should be strictly followed;
- Workers must be familiar with the Material Safety Data Sheets (MSDS) of each chemical used at site. MSDS are provided with each chemical drum. Chemicals will be stored as per their MSDS. Utmost care should be taken during the handling of these chemicals;
- Precautions should be taken to prevent spills and all workers should be trained in proper handling, storage and disposal of hazardous or toxic materials; and
- Proper disposal plans of excavated material.

1.15.3 Cultural Norms

Cultural Code of Practice should be developed for the Project and should include, at minimum, the following practices:

- Self-respect and sensitivity to insult is an important trait of the locals. The poorest among them has his own sense of dignity and honor and he vehemently refuses to submit to any insult. In fact every Pukhtoon considers himself equal if not better than his fellow tribesmen and an insult is, therefore, taken as scurrilous reflection on his character. So the contractor should be careful to avoid any unceremonious interaction with the locals and inform their staff to be humble and polite.
- The Contractor should also take care of the norms of local community and their sensitivity towards local customs and traditions;
- The Contractor should brief the staff about local culture and norms;
- As per local culture wearing of pant shirt, half shirts, and short trouser are considered inappropriate attire, therefore the contractor inform the staff to avoid wearing short trousers and short shirt;
- Contractor will strictly warn the staff not to involve in any unethical activities and to obey the local norms and cultural restrictions particularly with reference to women;
- The Contractor will be required to maintain close liaison with the local elders and religious scholars of nearby local community to ensure that any potential conflicts related to common resource utilization for the Project are resolved easily;
- Privacy of women is a major cause of concern for the communities of the Project Area. Due to the Project activities local women may not be able to perform their daily outdoor chores. Women in the Project are participate in other outdoor activities such as livestock rearing, bringing of potable water, collection of fire wood etc. that may be affected by the Project activities;
- The Contractor will have to select the specific timings for the construction activities so as to cause least disturbance to the local population particularly women considering their peak movement hours; and

- The Contractor will warn the staff strictly not to indulge in any un-ethical activities and to obey the local norms and cultural restrictions particularly with reference to women.

If privacy of the nearby households is to be affected, the Contractor will inform the house owner in advance to make some alternative arrangements. Similarly, the Contractor will have to take great care that the construction activities should not affect the privacy particularly with reference to women.

1.16 Public Disclosure

NTDC will disclose this EIA to all the stakeholders prior to the start of the construction. This report will be made available to the stakeholders at places as designated by the Punjab and KP-EPA. In addition, executive summary of the Report will be translated into Urdu language and made available to the affected communities and locals. The copies will also be kept at construction site for ease in accessibility of the locals. This will ensure the locals to be aware of the Project impacts, its mitigation, responsible staff and mode of implementation. In addition, the executive summary will also be published on NTDC website.

1.17 EMP Cost

The cost for EMP will be part of the contract document with the Contractor. It must be noted that environmental cost will not be a separate entity because all of its components will be addressed in the bidding document under various heads of account. For instance, tree plantation will be a part of landscaping, etc. The annual estimated cost for the implementation of environmental monitoring for both sections of the proposed Project is given in **Table 2.4** along with sampling parameters and frequency during construction.

Table 2.4: Environmental Management and Monitoring Cost Estimate

Sr. No.	Parameter	Mechanism	Frequency	Unit Rate (PKR)	Quantity	Cost (PKRs)	Remarks
A	**PRE- CONSTRUCTION PHASE**						
A-1	**Environmental Monitoring Cost**						
1	Water Resources/ Water Quality	Discrete grab sampling and laboratory testing of water samples by EPA approved Laboratory for monitoring.	Once		13 Nos.		One time monitoring shall be carried out before the mobilization of Contractor.
2	Noise Levels	dBA Leq. as per NEQS 2010 and PEQS 2016	Once		09 Nos		
3	Ambient Air Monitoring	Monitoring of CO, CO_2, SOx, NO_x, HC and $PM_{2.5}$ PM_{10} by EPA approved Laboratory	Once		09 Nos.		
	Sub-Total (A-1)						
A-2	**Compensation and Resettlement Cost**						
1	Crop Compensation	For two crop seasons loss. Cost worked out for each crops and finally weighted average considered.	Loss will be about three (03) times i.e. at the time of the excavations, concreting and pouring of tower foundations, tower installation and stringing of	Lump sum tentative cost based on final RP.		--	Compensation shall be paid based on the actual loss measured during construction stage by the Contractor and verified by PMU/NTDC. The attached crop compensation rates are based on the current prices and will be updated accordingly.

Sr. No.	Parameter	Mechanism	Frequency	Unit Rate (PKR)	Quantity	Cost (PKRs)	Remarks
			conductors				
2	Compensation for loss of Infrastructure	For each infrastructure such as shops, tubewells, houses, and other public utilities	Once based on market value	Lump sum tentative cost based on final RP.		--	Compensation shall be paid based on the actual loss measured during construction stage by the Contractor and verified by PMU/NTDC.
3	Compensation for Loss of Trees	For fruit trees	Once based on market value				This is the tentative tree compensation cost based on the current unit rate and quantification through statilite imagery and random field verifications. Compensation shall be paid based on the actual loss measured and updated prices during construction stage by the Contractor and verified by PMU/NTDC. This cost is for the loss of trees in reserved, guzara and community land
		For Timber / Wood Trees	Once based on market value				
	Sub-Total (A-2)						
A-3	**Tree Plantation Cost**						
1	Tree Plantation Cost	The cost and maintenance of one hectare of afforestation and estimated including	Lump Sum				Refer Sub-Section 9.13.1 The plantation cost is for the restoration of ecosystem and ensure the implementation of national legislations.

Sr. No.	Parameter	Mechanism	Frequency	Unit Rate (PKR)	Quantity	Cost (PKRs)	Remarks
		cost of layout, digging, planting, carriage and watch and ward and its maintenance for five years					
Sub-Total (A-3)							
Sub-Total A ((A-1)+(A-2)+(A-3))							
B	**CONSTRUCTION PHASE**						
B-1	**Environmental Monitoring Cost**						
1	Water Resources/ Water Quality	Discrete grab sampling and laboratory testing of water samples by EPA approved Laboratory for monitoring.	Quarterly		13 Nos		Quarterly monitoring cost for the one year construction period and will be updated each year based on latest rates during construction timeline of the proposed Project.
2	Noise Levels	dBA Leq. as per NEQS 2010 and PEQS 2016	Quarterly		09 Nos.		
3	Ambient Air Monitoring	Monitoring of CO, CO_2, SOx, NO_x, HC and $PM_{2.5}$ PM_{10} by EPA approved Laboratory	Quarterly		09 Nos.		
Sub-Total (B-1)							
B-2	**Environmental and Social Management Cost**						
1	HSE	Environment Personnel will monitor / conduct all HSE related activities	Monthly				This is the tentative monthly cost for one year period for one senior and two junior HSE experts along with their monthly

Sr. No.	Parameter	Mechanism	Frequency	Unit Rate (PKR)	Quantity	Cost (PKRs)	Remarks
		e.g. TBTs, PPEs, housekeeping, safety signage, emergency preparedness, etc.					logestics.
			Lump sum				Cost for PPEs, extinguishers, emergency lights, housekeeping equipment, safety signage and barricade, emergency preparedness kit, first aid kit, etc.
2	Ecological and Biodiversity Monitoring & Management	Monitoring of disturbance of habitats through encroachment, noise and other construction activities.	Monthly				This is the tentative monthly cost for one year period for one senior expert along with their monthly logistics.
3	Solid Waste Management	Collection, segregation, transportation, disposal and management of domestic, commercial, construction wastes	Monthly				This is the tentative monthly cost for one year period for one senior expert along with their monthly logistics.
			Lump sum				Cost for Collection, segregation, transportation, disposal and management of domestic, commercial, construction wastes
4	Social Welfare Cost	Based on the regular consultations with stakeholders including affectees and nearby community, through basic need assessment by the	Lump sum				Different social welfare Projects i.e. easy loans for affectees, rehabilitation of schools, roads, tracks, irrigation channels etc.

Sr. No.	Parameter	Mechanism	Frequency	Unit Rate (PKR)	Quantity	Cost (PKRs)	Remarks
		contractor and verified by PMU/NTDC coordinating the district social welfare department.					
5	Training Cost	Literature preparation, printed material such as posters & pamphlets trainer(s), and vanue, etc.	Monthly				This is the tentative monthly cost for one year period for one trainer along with logistics at site.
6	Audit	Auditor's checklists & proformas	Bi-annual				This is the tentative biannual cost for one year period for at least two auditors along with logistics, travels and accommodation charges.
7	Communicable Diseases	Tests should be performed by approved laboratory	Quarterly				This is the tentative quarterly cost for one year period for medical tests of kitchen staff at each camp site.
Sub-Total (B-2)							
Sub-Total B ((B-1)+(B-2))							**Tentative for eighteen (18) months project construction period. The cost shall be updated based on the current market prices during construction phase.**
C	**DEFECT LIABILITY PHASE (One Year Cost)**						

Sr. No.	Parameter	Mechanism	Frequency	Unit Rate (PKR)	Quantity	Cost (PKRs)	Remarks
C-1	**Environmental Monitoring Cost**						
1	Water Resources/ Water Quality	Discrete grab sampling and laboratory testing of water samples by EPA approved Laboratory for monitoring.	Biannually for One Year		08 Nos.		Biannually monitoring cost for the one year during this Phase
2	Noise Levels	dBA Leq. as per NEQS 2010 and PEQS 2016	Biannually for One Year		05 Nos.		
3	Ambient Air Monitoring	Monitoring of CO, CO_2, SOx, NO_x, HC and $PM_{2.5}$ PM_{10} by EPA approved Laboratory	Biannually for One Year		05 Nos.		
Sub-Total (C-1)							
C-2	**Environmental and Social Management Cost**						
1	HSE Activities	Contractor	Monthly				This is the tentative monthly cost for one year period for one senior HSE staff along with his site visit cost and logistics arrangements.
	Sub-Total (C-2)						
	Sub-Total C ((C-1)+(C-2))						**Tentative for (01) year project during this phase.**
	Grand Total (A+B+C)						
	Contingency Charges		10% of Grand Total				
	Grand Total with Contingencies						

ANNEXURE-C

BIO-DIVERSITY ACTION PLAN (BAP)

Biodiversity Action Plan

PUBLIC

December 2023

Pakistan: Power Transmission Strengthening Project

Biodiversity Action Plan for Pakistan Transmission Lines of Subproject 1 (Sangal to Maira) and Subproject 2 (Maira to Islamabad West).

Prepared by National Transmission and Despatch Company Limited (NTDC) for the Asian Development Bank (ADB).

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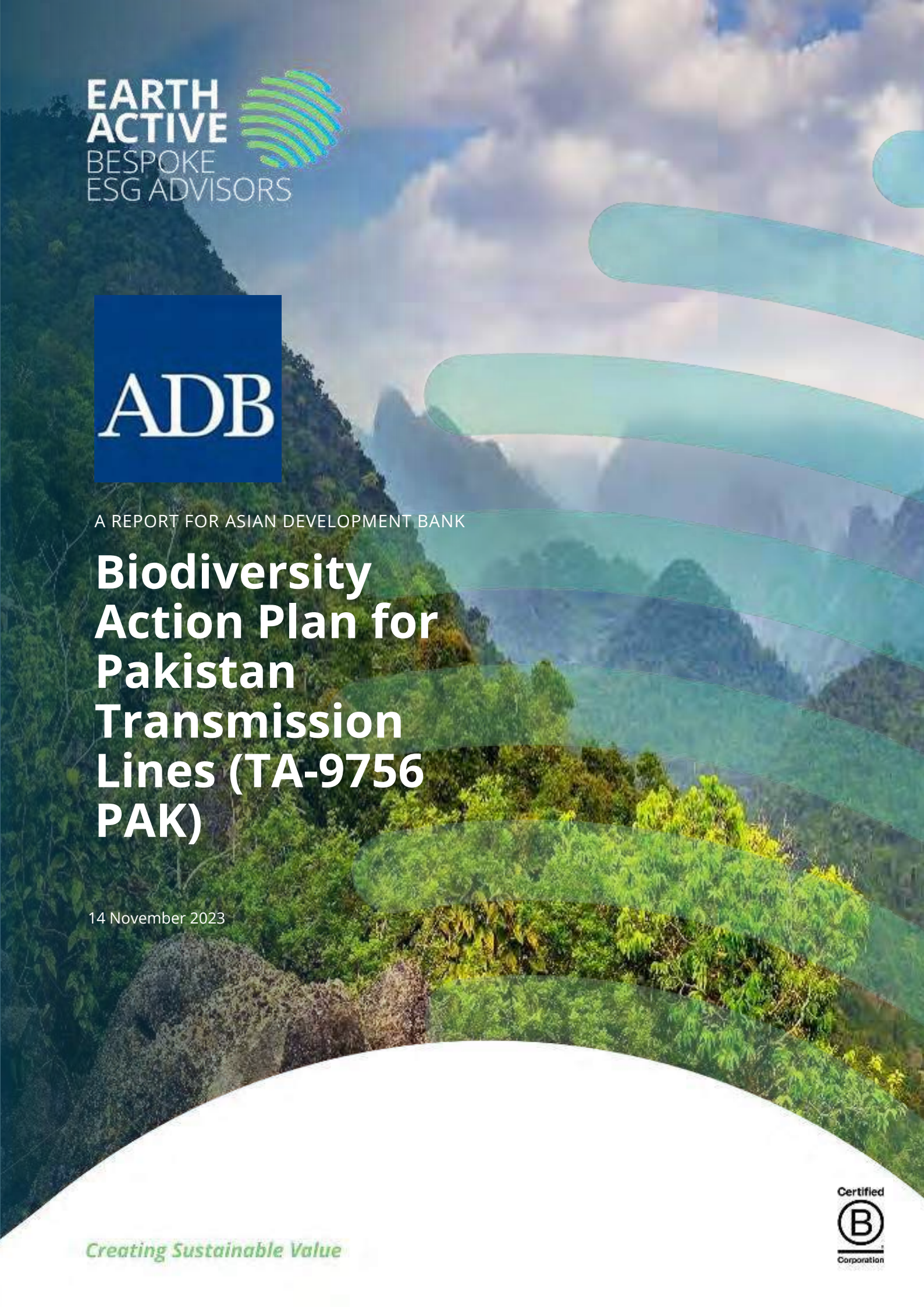

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A REPORT FOR ASIAN DEVELOPMENT BANK

Biodiversity Action Plan for Pakistan Transmission Lines (TA-9756 PAK)

14 November 2023

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Abbreviations

ADB	Asian Development Bank
ASCII	American Standard Code for Information Interchange
ASL	Above Sea Level
AUC	Area Under Curve
BAP	Biodiversity Action Plan
BMC	Biodiversity Management Committee
BMP	Biodiversity Management Plan
CHA	Critical Habitat Assessment
CR	Critically Endangered
CSAIL	China Three Gorges South Asia Investment Limited
DBH	Diameter Breast Height
DEM	Digital Elevation Model
ECON	Ecosystems Conservancy
EHV	Extra High Voltage
EIA	Environmental Impact Assessment
EN	Endangered
EOO	Extent of Occurrence
GBIF	Global Biodiversity Information Facility
GIP	Good Industry Practice
GN6	Guidance Note 6
HPP	Hydropower Project
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
KPCL	Karot Power Company Limited

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KPI	Key Performance Indicator
KPK	Khyber Pakhtunkhwa
MKKS	Murree Kahuta Kotli Sattian National Park
NBS	National Biodiversity Specialist
NDVI	Normalised Difference Vegetation Index
NG	Net Gain
NNL	No Net Loss
NSAIDS	Non-steroidal Anti-inflammatory Drugs
NTDC	National Transmission and Dispatch Company
PA	Protected Area
PMAS-AAUR	Pir Mehr Ali Shah Arid Agriculture University Rawalpindi
PMU	Project Management Unit
PS6	Performance Standard 6
PTEIP II	Second Power Transmission Enhancement Investment Program
Q-GIS	Quantum GIS
SC	Supervision Consultant
SDM	Species Distribution Modelling
SPS	Safeguard Policy Statement 2009
T/L	Transmission Lines
TOR	Terms of Reference
TPI	Topographic Position Index
TRI	Terrain Ruggedness Index
VU	Vulnerable

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Executive Summary

The Asian Development Bank (ADB) is considering financing the construction of new transmission lines (T/L) in northern Pakistan. This includes two T/L projects, referred to as Subproject 1 and Subproject 2. The total infrastructure will measure 230.5 km in length and includes:

- Subproject 1, 83.2 km of new T/L between Sangal and Maira
- Subproject 2, 130 km of new T/L between Islamabad West and Maira, and another 17.3 km on to Karot

After the redesign of the Project and the implementation of biodiversity mitigation, adverse significant residual impacts remain on the National Parks that the T/L passes through. In accordance with the mitigation hierarchy and international best practice, offset actions are required to compensate for these impacts.

Ten Protected Areas (PA), three critically endangered (CR) or endangered (EN) birds of prey and six CR, EN, or vulnerable (VU) fish species were also assessed to trigger critical habitat thresholds. In accordance with the ADB Safeguard Policy Statement (2009) (SPS) the Project must ensure no net loss and, in accordance with the International Finance Corporation (IFC) Performance Standard 6 (PS6), all critical habitat must be subject to measures to achieve a net gain. The Project's Biodiversity Action Plan (BAP) is designed to align with IFC PS6.

Given the scale and relative magnitude of the impacts, this BAP focuses primarily on the Murree Kahuta Kotli Sattian National Park (MKKS), which will be subject to the construction of 270 T/L towers, each resulting in the permanent loss of approximately 10 m^2 within the MKKS. Across the 78 km that the T/L will span the MKKS, and given the 10 m^2 land take area of each tower, this will result in the unavoidable permanent habitat loss of approximately 0.27 ha within the MKKS. The objectives are to offset the permanent habitat loss and achieve a net gain for the MKKS. Actions will target improved MKKS governance and management structures, increased off-site community engagement, and increased off-site forest enhancement. The BAP also includes an action for the Egyptian vulture (*Neophron percnopterus*), white-rumped vulture (*Gyps bengalensis*), and steppe eagle (*Aquila nipalensis*), which all trigger critical habitat. Its objective is to complete a ten-year bird monitoring programme in the area that will contribute to long-term management of, and finance decisions for, the MKKS and indirectly a net gain for the species. The above actions, particularly those focused on the MKKS will indirectly benefit all other protected areas and the six fish species that trigger critical habitat.

Summaries of the BAP actions are shown in Table 1 on the following page:

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Table 1. BAP Actions Summary

BAP Action Summary	Responsibility	Total Indicative Cost (USD)
Governance and Stakeholder Collaboration: Improvement of governance and the management structure of the MKKS through stakeholder collaboration and the funding of one additional Biodiversity Management Committee (BMC) meeting per year for a total of three years. This includes funds to employ one additional staff member to facilitate and support the additional BMC meetings.	IUCN Pakistan (implementation lead); NTDC (accountable party); ADB (lender)	16,188.00
Forest Enhancement and Community Engagement: Funding of an IUCN led forest enhancement project to offset the permanent land take of the MKKS from the Project. Enhancement of habitat quality at a x20 multiplier of hectares removed, calculated at approximately 5.4 ha of enhancement required. This action will also support the IUCN in community engagement and schools outreach programmes in villages outside of the MKKS boundary to raise awareness about its importance and further support MKKS conservation efforts.	IUCN Pakistan (implementation lead); NTDC (accountable party); ADB (lender)	117,622.80
Long-term Bird Monitoring Programme: Funding of ten-year bird monitoring programme, to include ten three-day surveys per annum and community engagement. Surveys to be carried out by the Ecosystems Conservancy (ECON) research team. Survey data to be made available to the IUCN MKKS management team to inform conservation actions for the MKKS.	ECON (research lead); IUCN Pakistan (implementation lead); NTDC (accountable party); ADB (lender)	42,430.40
Additional Conservation Actions for Fish Species: Through the formation of a dedicated MKKS management team and engagement with communities along the Jhelum River tributaries, additional conservation outcomes will be achieved for the six fish species that trigger critical habitat.	IUCN Pakistan (implementation lead); NTDC (accountable party); ADB (lender)	Cost covered by the long-term bird monitoring programme IUCN management costs

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Monitoring and Adaptive Management: Costs associated with the procurement of the NBS and IBS services as per the requirements of this BAP and the basic principles of the BAP monitoring and adaptive management plan. This cost also includes an adaptive management contingency fund.	NTDC (accountable party); ADB (lender)	150,000.00
Total Indicative Cost		**326,241.20**

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1 Introduction

1.1 Overview

The Asian Development Bank (ADB) is considering financing the construction of new transmission lines (T/L) in northern Pakistan as part of the second Power Transmission Enhancement Investment Program (PTEIP II). The PTEIP II will consist of staggered investments in the high-voltage transmission systems, including the rehabilitation, augmentation and expansion of transmission lines, substations, and supporting infrastructure. The investments will increase transmission capacity to meet growing demand, improve reliability and system security, and evacuate additional sources of power.

There are two projects within this phase of the PTEIP II that are relevant to this Biodiversity Action Plan (BAP) document, referred to as Subproject 1 and Subproject 2. The total infrastructure will measure 230.5 km in length and includes:

- Subproject 1, 83.2 km of new T/L between Sangal and Maira
- Subproject 2, 130 km of new T/L between Islamabad West and Maira, and 17.3 km between Maira and Karot

These developments are herein collectively referred to as the 'Project', the overview of which is covered in Section 1.4 below.

Detailed Environmental Impact Assessments (EIA) and Critical Habitat Assessments (CHA) were completed for both Subprojects. Together the assessments identified sensitive and rare biodiversity receptors relevant to the Project. The ADB Safeguard Policy Statement 2009 (SPS), against which the assessments were completed, requires robust actions to offset any significant adverse impacts on biodiversity receptors within which the Project falls. The SPS also requires that No Net Loss (NNL), and ideally Net Gain (NG), is achieved for all critical habitat receptors relevant to the Project.

In parallel with the SPS, the Project was also assessed against the International Finance Corporation (IFC) Performance Standard 6 (PS6). Under PS6 Guidance Note 6 (GN6), it is a requirement that a NG is achieved for all biodiversity receptors that trigger critical habitat and that a BAP is created to detail the measures intended to achieve a NG. This BAP is designed to align with IFC PS6.

1.2 Purpose of the Biodiversity Action Plan

The purpose of a BAP is to safeguard, restore, and enhance the conservation status of rare or threatened species and habitats. In the context of development projects, a BAP is required where adverse significant impacts remain after mitigation and actions are needed to offset the impact, where a project or development is within critical habitat, or if a project proponent seeks to achieve the highest standards in long-term biodiversity enhancement and management.

The ADB SPS requires that their associated projects achieve a NNL as a minimum for critical habitat triggers.

The Project EIA identified significant adverse impacts on numerous biodiversity receptors. The EIA and its associated Biodiversity Management Plan (BMP) detailed mitigation measures to avoid and reduce the impacts, and ultimately to achieve NNL. However, following these on-site mitigation measures, certain adverse significant residual impacts remain. In accordance with the mitigation hierarchy, additional offset actions are required to compensate for these impacts. This BAP comprises actions and measures that meet the internationally recognised offset requirements.

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The Project also falls within critical habitat for numerous biodiversity receptors. In line with ADB SPS and IFC PS6 requirements, a BAP is required to ensure the Project achieves NNL for all species and a NG for the species and biodiversity features for which critical habitat has been triggered. This BAP provides the objectives and intended actions to support the Project's achievement of NNL and NG.

This BAP provides:

- An overview of the Project context
- An explanation of how the mitigation hierarchy has been applied
- An overview of stakeholder consultation specific to this BAP
- The overall BAP roles and responsibilities
- A summary of the biodiversity present in the Project area, with specific reference to the target species and biodiversity features
- A breakdown of each BAP action designed to achieve a NG, in line with IFC PS6 requirements, as per Project funding commitments during construction and operation for the target species and biodiversity features
- Details of how the BAP actions will be implemented, monitored and measured, the indicators of success, specific roles and responsibilities, and associated indicative costs
- Details on the monitoring and adaptive management of the BAP as a dynamic document, including thresholds and indicators for when adaptive management is triggered for each action

1.3 Scope of the Biodiversity Action Plan

The Project EIAs and CHAs assessed biodiversity features and species that occur, or potentially occur, within 50 km of the Project. Both assessments applied good industry practice (GIP) methodologies recognised by the ADB and IFC to collate and assess the data to identify the biodiversity receptors most relevant to the Project. In accordance with the ADB SPS and IFC PS6 these include receptors that may be directly or indirectly affected, adversely or beneficially, and receptors that may qualify as critical habitat.

The assessments found that many of the species and biodiversity features likely to be affected by the Project could have the impacts reduced to an acceptable level, that being a negligible impact for most, through application of the mitigation hierarchy. The receptors subject to significant adverse residual impacts, and those that qualify as critical habitat, were assessed for inclusion in this BAP. The receptors that were assessed comprise ten Protected Areas (PA), three critically endangered (CR) or endangered (EN) birds of prey and six CR, EN, or vulnerable (VU) fish species. The receptors are introduced in Table 2 and the relevant SPS criterion explanations are provided in Box 1.

Table 2. The biodiversity receptors that were assessed for inclusion within this Biodiversity Action Plan

Reference No.	Receptor (English/Common Name)	Scientific Name	IUCN Status	Reason(s) for Inclusion in BAP	Relevant Subproject
1	Murree Kahuta Kotli Sattian National Park (MKKS)	N/A	N/A	Significant adverse impact and CHA – Criterion 7; Most significant adverse impact is on this PA	Both

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2	Kala Chitta National Park	N/A	N/A	Significant adverse impact and CHA – Criterion 7	Islamabad West and Karot
3	Kheri Murat National Park	N/A	N/A	Significant adverse impact and CHA – Criterion 7	Islamabad West and Karot
4	Murree Forest Reserve	N/A	N/A	Significant adverse impact and CHA – Criterion 7; Overlaps with the MKKS but formal boundary is not known	Both
5	Kotli Sattian Forest Reserve	N/A	N/A	Significant adverse impact and CHA – Criterion 7; Overlaps with the MKKS but formal boundary is not known	Both
6	Kahuta Forest Reserve	N/A	N/A	Significant adverse impact and CHA – Criterion 7; Overlaps with the MKKS but formal boundary is not known	Both
7	Gianthal Forest Reserve	N/A	N/A	Significant adverse impact and CHA – Criterion 7; Overlaps with the MKKS but formal boundary is not known	Sangal and Maira
8	Kohatti Forest Reserve	N/A	N/A	Significant adverse impact and CHA – Criterion 7; Overlaps with the MKKS but formal boundary is not known	Sangal and Maira
9	Pail Forest Protected Forest	N/A	N/A	Significant adverse impact and CHA – Criterion 7; Overlaps with the MKKS but formal boundary is not known	Sangal and Maira

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10	Mujahid Forest Reserve	N/A	N/A	Significant adverse impact and CHA – Criterion 7; Adjacent to the MKKS but formal boundary is not known	Islamabad West and Karot
11	Egyptian vulture	*Neophron percnopterus*	EN	CHA – Criterion 1(a)	Both
12	White-rumped vulture	*Gyps bengalensis*	CR	CHA – Criterion 1(a)	Both
13	Steppe eagle	*Aquila nipalensis*	EN	CHA – Criterion 1(a)	Both
14	Fish (no common name)	*Glyptothorax kashmirensis*	CR	CHA – Criterion 1(a) and 2	Sangal and Maira
15	Fish (no common name)	*Triplophysa kashmirensis*	CR	CHA – Criterion 1(a) and 2	Sangal and Maira
16	Fish (no common name)	*Glyptothorax punjabensis*	EN	CHA – Criterion 1(a) and 2	Both
17	Bhed catfish	*Glyptothorax stocki*	EN	CHA – Criterion 1(a) and 2	Both
18	Fish (no common name)	*Barilius naseeri*	VU	CHA – Criterion 1(a) and 2	Islamabad West and Karot
19	Fish (no common name)	*Paraschistura prashari*	NT	CHA – Criterion 2	Islamabad West and Karot

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Box 1: Relevant SPS Criterion Explained

Criterion 1

SPS criterion 1 for Critical Habitat are areas required for the survival of critically endangered or endangered species. The corresponding IFC GN6 thresholds for this criterion add further detail to allow for more accurate assessment, and are as follows:

(a) Areas that support globally important concentrations of an IUCN Red-listed EN or CR species (≥0.5% of the global population AND ≥ 5 reproductive units of a CR or EN species).

(b) Areas that support globally important concentrations of an IUCN Red-listed Vulnerable (VU) species, the loss of which would result in the change of the IUCN Red List status to EN or CR and meet the thresholds in (a) above.

(c) As appropriate, areas containing important concentrations of a nationally or regionally listed EN or CR species.

Criterion 2

ADB Criterion 2 for critical habitat are *areas having special significance for endemic or restricted-range species*. IFC GN6 defines a terrestrial restricted-range species as having an EOO (Extent of Occurrence) of less than 50,000 km^2. The critical habitat threshold for this criterion is:

(a) Areas that regularly hold ≥ 10% of the global population size AND ≥ 10 reproductive units of a species.

Criterion 7

ADB Critical Habitat Criterion 7 is relevant to areas either legally protected or officially proposed for protection, such as areas that meet the criteria of the World Conservation Union classification, National Parks, the Ramsar List of Wetlands of International Importance, and the United Nations Educational, Scientific, and Cultural Organization's world natural heritage sites.

The Murree Kahuta Kotli Sattian National Park (MKKS) will be the most significantly impacted ecological receptor. This PA includes and shares a boundary with the Murree Forest Reserve, Kotli Sattian Forest Reserve, Kahuta Forest Reserve, Gianthal Forest Reserve, Kohatti Forest Reserve, Pail Forest Protected Forest, and Mujahid Forest Reserve (also referred to as MKKSs constituent PAs). Each of these constituent PAs are therefore addressed and included within any actions that focus on the MKKS. In total, 195 Subproject 1 towers will be constructed in the MKKS, leading to 60 km passing through it and its constituent parts. There are 75 towers of Subproject 2 passing through the MKKS, totalling 18 km in length. Cumulatively this results in 270 towers across 78 km of T/L.

In comparison, the Kala Chitta and Kheri Murat National Parks are less impacted as the Project footprints in these PAs totals 3 km and 1 km in length, respectively, as shown in Figure 1.

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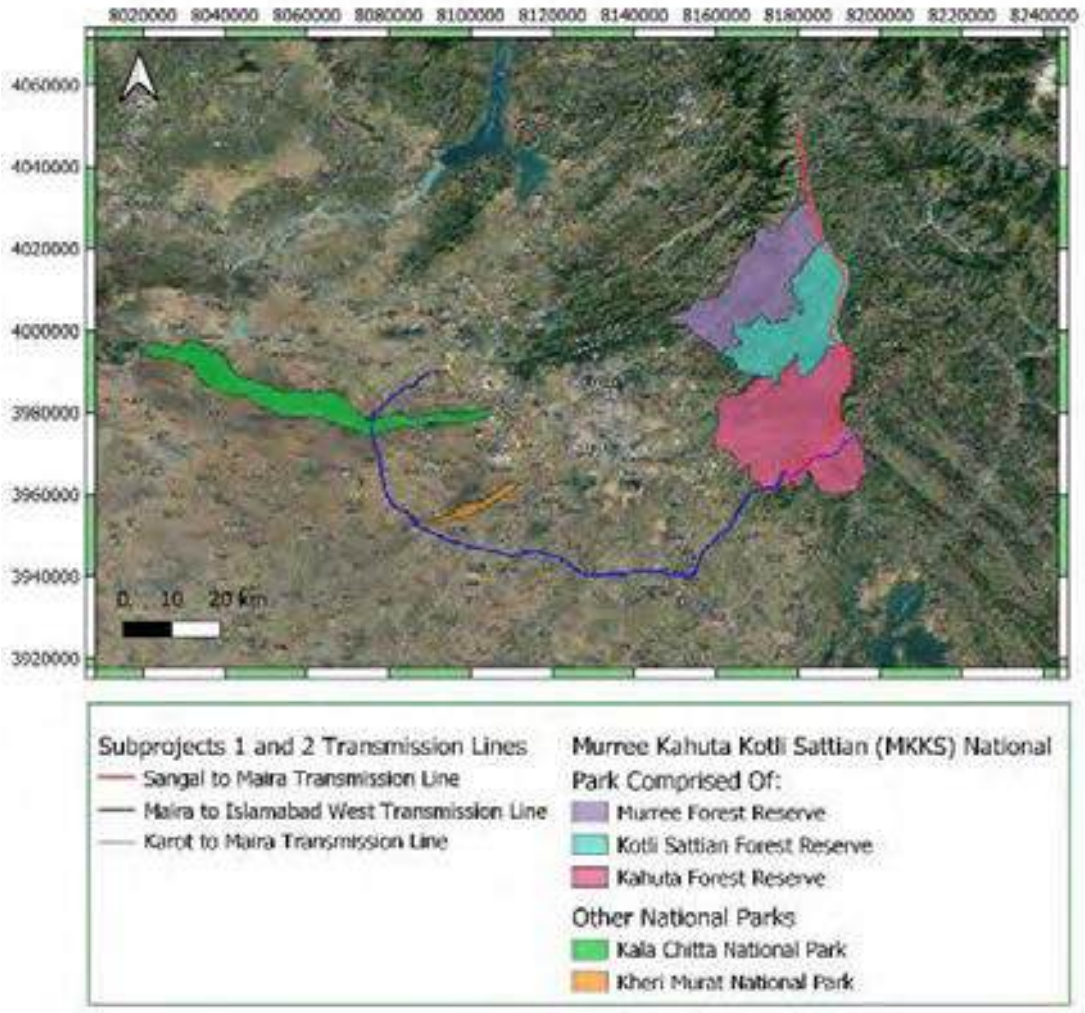

Figure 1: National Parks in close proximity to the Project

Each PA will be subject to permanent land take for the construction of each tower's footings, approximately 10 m^2 per tower, leading to a permanent adverse loss of land from the National Parks. Most of the impacts will be felt at the MKKS, which is subsequently the focus of this BAP. The MKKS focused actions within this BAP are designed to result in positive conservation outcomes for the other PAs as they are either within, or in proximity to, the MKKS.

The MKKS provides habitat for the Egyptian vulture, white-rumped vulture, steppe eagle, and six fish species that all trigger critical habitat for the Project. The risk to birds of collision with T/Ls is addressed through on-site mitigation measures and T/L design features. The fish species can be found in rivers that flow around the region, such as the Jhelum River, however, with no construction works occurring within 50 m of a watercourse, there are no significant impacts expected on the fish. These species remain part of this BAP as they trigger critical habitat and a NG in their conservation status is required.

The receptors that are scoped into this BAP include:

- Murree Kahuta Kotli Sattian National Park (MKKS);
- Egyptian vulture, white-rumped vulture, and steppe eagle; and
- Six fish species (indirectly through the MKKS actions)

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The off-site conservation actions covered in this BAP build on, but do not duplicate, the on-site biodiversity mitigation and compensation measures included in the Project EIAs and associated BMPs. This BAP is a live document that should be updated as the Project develops over time, both in the construction and operational phases, and as the conservation context of the PAs and target species changes. Under the requirements of NG, the 'gains' must be in place for as long as the 'losses' exist, that being so long as the Project impacts, both direct and indirect, are present. This BAP outlines the following for each action:

- Objective
- Summary overview
- Conservation targets
- Methodology
- Indicators of success
- Roles and responsibilities
- Resources

1.4 Project Overview

The National Transmission and Despatch Company (NTDC) is the responsible entity for the construction and operation of the Project, including the bulk power transmission to the distribution companies. NTDC has planned an integrated 500 kV transmission interconnection arrangement to evacuate power from the proposed hydropower plants in northern Pakistan. NTDC will be the recipient of the ADB loan for the Project and therefore ultimately accountable for the delivery of this BAP.

The Project comprises the construction of two Subprojects:

1.4.1 Subproject 1

The proposed Subproject 1 comprises the development of 500 kV of extra high voltage (EHV) T/L from an interconnection point at Sangal (Abbottabad) to a switching station at Maira (Rawalpindi). Figure 2 shows the location of the proposed T/L. It will disperse power from the Suki Kinari Hydropower Project (HPP) located on Kunhar River near Paras village in Mansehra district, Khyber Pakhtunkhwa (KP) to the National Grid. The total length of the proposed T/L from Sangal to Maira is 83.2 km. The 500 kV double circuit line will pass through two provinces, Khyber Paktunkhwa and Punjab, and comprise 238 towers. Tower types include suspension ('SDS'), light angle ('SDL'), medium angle ('SDM'), dead end/ heavy angle ('SDD'), and transposition ('SDT'), see Figure 3.

1.4.2 Subproject 2

The proposed Subproject 2 comprises the construction of a 130 km 500 kV double circuit T/L from Maira Switching Station (Rawalpindi) to Islamabad West Grid Station (Attock) (Section 1), and a 17.3 km 500 kV double circuit T/L from Maira Switching Station to Karot Hydropower Station (Section 2). The 500 kV Double Circuit line will comprise 467 towers: 411 in Section 1 and 56 in Section 2. Figure 2 shows the route of the two sections in the landscape.

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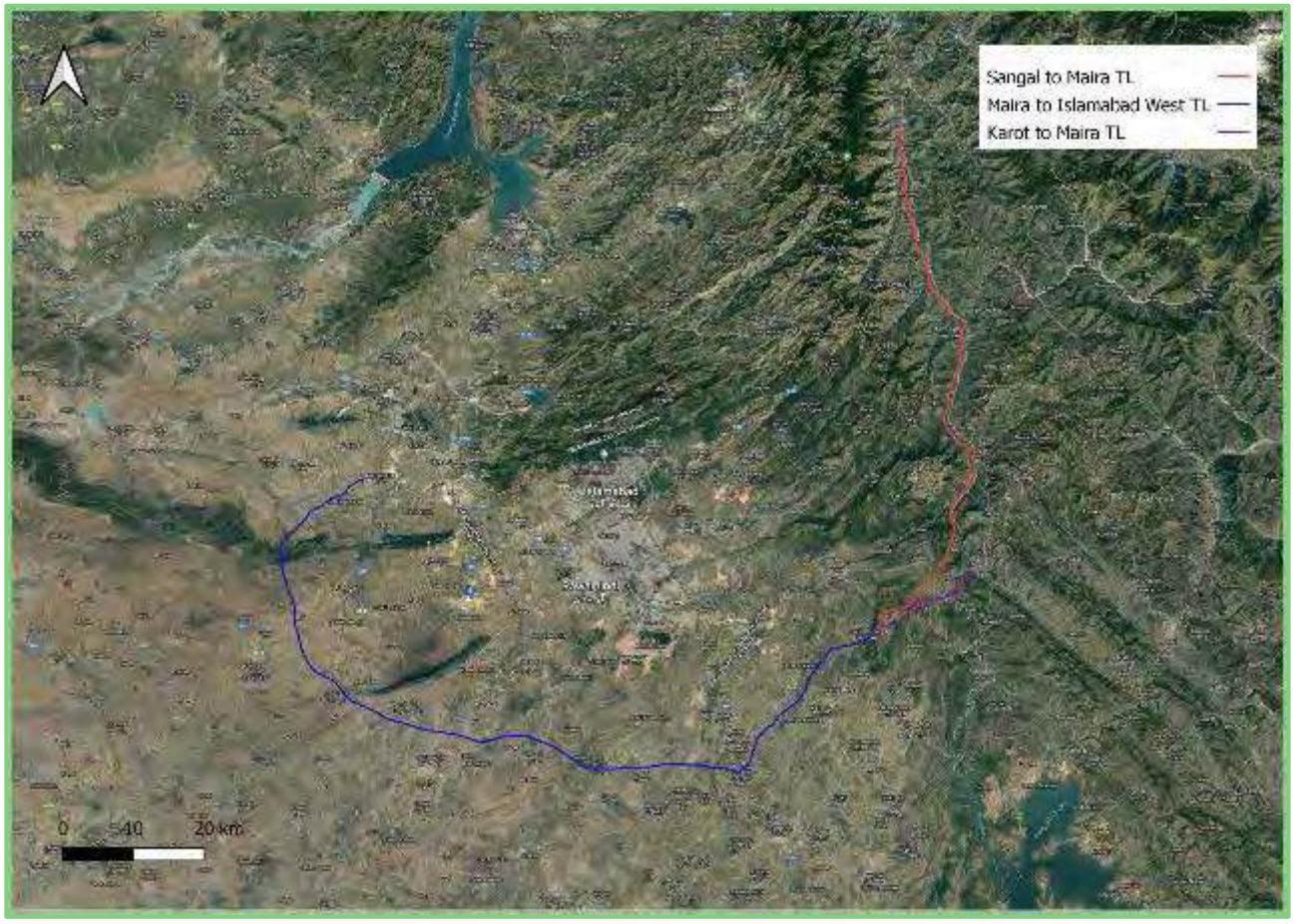

Figure 2. Shows the Project T/L route split into its constituent parts

Figure 3. Examples of the pylon design

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1.5 Application of the Mitigation Hierarchy

The mitigation hierarchy is a set of industry recognised principles used in the EIA process. The hierarchy supports the assessment, and ideally the subsequent reduction, of biodiversity impacts from a project (**Error! Reference source not found.**Figure 4). The mitigation hierarchy has been applied throughout the d esign process of the Project and specifically to all likely and potentially adverse impacts. For the protection and conservation of biodiversity, the mitigation hierarchy includes the following steps:

1. **Avoid:** as a matter of priority, the client should seek to avoid impacts on biodiversity and ecosystem services
2. **Minimise:** when avoidance of impacts is not possible, measures to minimise impacts to biodiversity and ecosystem services should be implemented
3. **Restore:** when avoidance and minimisation of impacts is not possible, measures to restore biodiversity and ecosystem services should be implemented
4. **Offset:** biodiversity offsets may be considered only after appropriate avoidance, minimisation and restoration measures have been applied and where there is a significant adverse residual impact. A biodiversity offset should be designed and implemented to achieve measurable conservation outcomes that can reasonably be expected to result in NNL or NG of biodiversity, dependent on the requirements of the standards being applied
5. **Additional Conservation Outcomes:** additional conservation outcomes are those actions that further contribute to the achievement of NNL or NG and help the improvement of the overall conservation efforts, often in additional to a measurable biodiversity offset

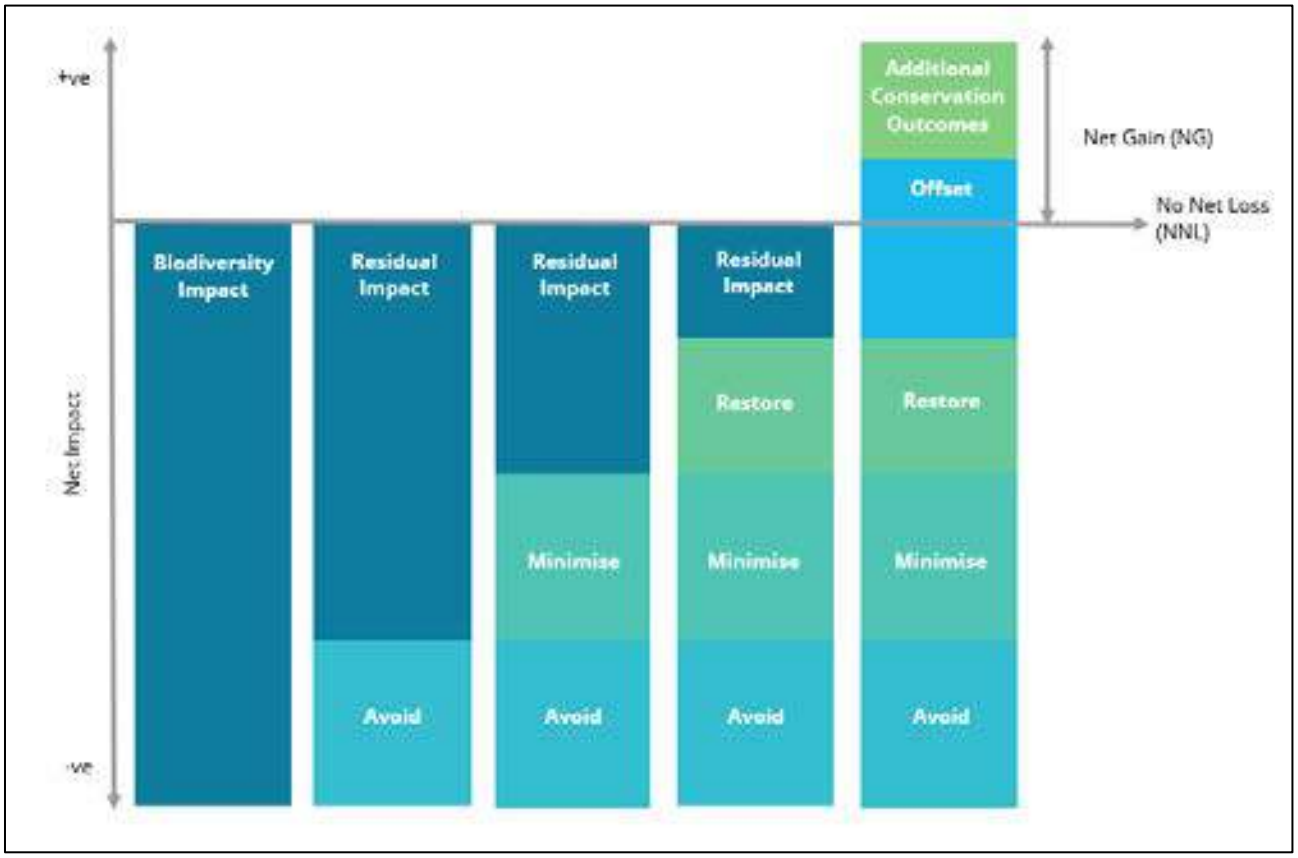

Figure 4. The mitigation hierarchy and the steps leading to the reduction of a residual impact and desired no net loss and net gain targets

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1.6 Stakeholder Consultation

Stakeholder consultation is a key requirement of the ADB SPS and IFC PS6 standards and forms an important part of the BAP development process. This includes affected communities, local and indigenous groups, biodiversity experts and, where appropriate, other stakeholders. Stakeholder values associated with the biodiversity receptors scoped into the BAP provide valuable context to refine the actions and ongoing roles and responsibilities to support the achievement of the NNL or NG requirements. Some of the most important stakeholders can also be BAP partners who help deliver the offset and/or additional conservation actions set out in the BAP.

According to the SPS requirements, projects developed in National Parks necessitate consultation with the respective park authorities. As such, the relevant Forest, Wildlife & Fisheries Departments were contacted.

Approvals must be gained from the provincial government departments who uphold jurisdictions in areas the BAP actions are set to pass through. The following provincial government departments were consulted in the formation of the relevant BAP actions:

- Punjab
- Rawalpindi

Multi-stakeholder consultation has occurred to establish the views, obtain data, contribute to design, and confirm implementation partners for the actions detailed in this BAP. Those stakeholders who formed a notable role and helped inform the BAP are shown in Table 3 below.

A full list of stakeholders contacted and engaged with during the consultation process of this BAP can be found in Appendix 1.

Table 3. Shows a record of the notable correspondence involved in the consultation process for this BAP

Name of Organisation	Attendees	Means of Correspondence	Dates of Correspondence	Reason for Correspondence
IUCN Pakistan	Asim Jamal; Akhtar Cheema Mahmood; Ashraf Komal	In-person meeting, virtual meeting, emails, and data exchanges	July 2023 – September 2023	They are part of the IUCN MKKS BMP management team and are responsible for its implementation. Partnering with them has allowed the ADB to support some of the actions included in the MKKS BMP
WWF Pakistan	Muhammad Jamshed Iqbal Chaudry	Virtual meeting, emails, data exchange	July 2023 – August 2023	Muhammad has important data on the vulture and fish species in relation to the transmission lines and to discuss potential species presence
Wildlife Department, Rawalpindi Region,	Rizwana Imtiaz Khan	In-person meeting, emails	July 2023	Rizwana is responsible for wildlife protection and enhancement in protected areas of the transmission line route

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Punjab province				covering Kahuta Forest Reserve of MKKS National Park
Ecosystems Conservancy (ECON)	Faraz Akrim	Virtual meetings, emails, data exchange	July 2023 – September 2023	Dr. Akrim is a bird specialist and will be responsible for the long-term bird monitoring programme within this BAP
ADB	Aziz Akrim	Emails, data exchange	July 2023 – August 2023	Aziz is the ADB point of contact in Islamabad, Pakistan and is responsible for all in-person meetings with relevant local stakeholders

Following the meetings above, subsequent email correspondence took place and documentation was shared to further support the actions detailed in this BAP. Written approval was gained from BAP partners confirming their involvement in its implementation.

2 BAP Roles and Responsibilities

The implementation of the BAP will be complex, and its success will depend on many timely actions and numerous stakeholders. A set of simple, well defined, and agreed roles and responsibilities is therefore critical to success. This must be relevant to all phases of the project from implementation and monitoring to adaptive management and include all relevant parties.

The key parties involved in the implementation of the BAP and their roles and core responsibilities are summarised in Table 4.

Table 4. BAP implementation roles and responsibilities

Company/Institution	Role and Responsibilities in the BAP
The National Transmission and Dispatch Company (NTDC)	Accountable for the successful implementation of the BAP during construction and operation. NTDC will ensure the BAP is financed, progresses as planned, and is monitored throughout the Project's operational phase. NTDC will delegate the day-to-day management of the BAP to other parties, including its dedicated internal Project Management Unit (see below). All delegated actions and responsibilities must be subject to legal assurance via contracts, agreed milestones, monitoring, and penalties for possible failure. NTDC will remain accountable for the BAP during the operational phase of the project, when most parties have fulfilled their contractual construction responsibilities. NTDC will be accountable for regularly reporting BAP progress to the ADB and the relevant national authorities as part of the loan agreement. In order to effectively report progress to the ADB, NTDC will need to receive regular updates from BAP implementation partners on the ongoing delivery success of the BAP actions described within. NTDC will be required to contract suitable biodiversity capacity to ensure monitoring and reporting of this BAP's performance for the duration of

	the tasks described within. In order to fulfil this obligation satisfactorily, biodiversity capacity in line with the competencies described in the International Biodiversity Specialist (IBS) and National Biodiversity Specialist (NBS) positions below will be required. The IBS/NBS must be contracted for the entire duration of construction and for a minimum of five years after construction finishes. Anything less than those competencies will compromise the potential achievement of the BAPs primary aim; NG for the biodiversity features described within. Additional species-specific expertise may also be required when defining adaptive management measures, and NTDC must contract such expertise as and when required. Should the monitoring of the BAP identify that the prescribed actions are not delivering, or not on track to deliver, the NG required, NTDC will be accountable for developing appropriate adaptive management measures using suitably qualified biodiversity personnel.
The NTDC Project Management Unit (PMU)	The NTDC's dedicated internal project specific PMU will be responsible for the management and successful delivery of the Project on time and to budget during the construction phase. The PMU will achieve its objectives by procuring a Construction Supervision Consult, Contractors, Biodiversity Specialists, and other experts to complete required works. Given its delegated responsibilities from NTDC, the PMU will be responsible for the implementation of the BAP during the construction phase. The PMU will be responsible for monitoring the implementation of the BAP regularly, as well as the biodiversity components of the EIA, Environmental Management Plan, and the BMP.
International Biodiversity Specialist (IBS)	The IBS will be a Third Party firm or individual. The IBS must have a minimum of 15 years working in biodiversity conservation, with experience working on major international projects and in working with international E&S standards such as IFC Performance Standards and ADB SPS. Regional conservation experience would be preferable but is not required. The IBS must have these skills and experiences to ensure the successful delivery of the BAP. They will act as external experts and provide NTDC/PMU with a service of reviewing the development and success of the BAP over time and with technical assistance in developing contingency plans if the BAP actions are not fulfilled. If BAP actions fail or deviate from the BAP or could be improved, the NTDC, using the services of the contracted IBS/NBS, must develop adaptive management measures. The IBS will report directly to the NTDC/PMU. The IBS should procure the services of the NBS, Project Partners and potentially other stakeholders (e.g. Government Departments) if it is required to develop successful adaptive management measures. The IBS will be contracted for the entire duration of construction and a minimum of five years after construction finishes.
National Biodiversity Specialist (NBS)	The NBS will be responsible for managing the implementation of the Project's BMP during construction. The NBS must have a minimum of 10 years working in ecology of the Northern Pakistan region, ecological survey experience, ability and flexibility to travel to the BAP action sites as required, and be suitably qualified and experienced to ensure successful delivery of the BAP. If required by the Project Partners, or requested by the NTDC, the NBS will support in the implementation of the BAP and its monitoring.

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Project Partner - International Union for the Conservation of Nature (IUCN)	The Project Partner responsible for the successful implementation of the BAP actions relevant to the Murree Kahuta Kotli Sattian National Park. Responsibilities will include the professional and transparent use of the relevant BAP action budgets, the timely and successful delivery of the prescribed actions to meet the conservation targets, and the regular and transparent communication of progress. Annual progress must be provided to the NTDC, as per the NTDC's requirements, and the IUCN must always allow any NTDC, PMU, ADB, IBS and NBS staff full access to all aspects of the BAP at all times. The IUCN will be required to provide any necessary data relevant to the performance of this BAP as requested by the NBS is preparation of quarterly reports.
Project Partner – Ecosystems Conservancy (ECON), NGO, Islamabad	Project Partner for the Egyptian vulture, white-rumped vulture and steppe eagle BAP action has responsibilities including the professional and transparent use of the relevant BAP action budgets, the timely and successful delivery of the prescribed actions to meet the conservation targets, and the regular and transparent communication of progress. Annual progress must be provided to the IUCN and NTDC, as per the BAP requirements, and ECON and IUCN must always allow any NTDC, PMU, ADB, IBS and NBS staff full access to all aspects of the BAP. ECON will be required to provide any necessary data relevant to the performance of this BAP as requested by the NBS is preparation of quarterly reports.
Pir Mehr Ali Shah Arid Agriculture University Rawalpindi (PMAS-AAUR)	Project Partner for the Egyptian vulture, white-rumped vulture and steppe eagle BAP action. Responsible for the provision of technical insight and the independent annual monitoring of the actions. Instructions will be received by the NTDC, and all reporting will be directed to the NTDC.
The Construction Supervision Consultant, (SC)	Responsible for ensuring compliance of all civil work described in the EIA and its associated documentation, including this BAP. Responsible therefore for ensuring the Contractor correctly implements and complies with any earth works, forest enhancement, tree planting, habitat improvement or restoration, or equipment installation, as required by the BAP.
The Contractor	Responsible for all physical enhancement activities, including appropriate elements of forest enhancement such as tree planting. Contractor to ensure suitably qualified expertise is contracted to effectively conduct all physical enhancement activities, and the monitoring of, in line with the requirements of this BAP. Expertise could be contractor permanent staff or subcontracted specialists. Contractor will be responsible for monitoring of progress of physical enhancement activities and the implementation of adaptive management measures, as required in Section 6.
Asian Development Bank (ADB)	The financing entity responsible for the ensuring the planned BAP is aligned with its own SPS. The ADB retain the right to externally review and monitor progress of the BAP for the duration of the loan agreement. Any failures or deviations from the BAP will be reported to NTDC who will be responsible for adaptive management.

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3 Biodiversity Context

The Project is located within the Punjab and Rawalpindi regions of Pakistan in the north-eastern corner of the country. The landscape of these regions comprises a variety of habitats and land uses including agricultural lowlands, mountain and hill forests, scrub, and barren land.

Subproject 1 starts in the northern hills and mountains of Abbottabad at approximately 1000 m above sea level (ASL) and descends south to the lower lying plains of Rawalpindi, 500 m ASL at its lowest point. The majority of the alignment follows the Jhelum River, a major river that flows from the higher mountains to the north into Mangla Lake approximately 100 km to the south, and eventually into the Indus River and the Arabian Sea. The Jhelum basin has a mean temperature of 13.72°C and mean annual precipitation of 1202 mm. Forested areas along the T/Ls are characterised as sub-tropical pine forest and broad-leaved shrub forest and dominate the central and northern reaches of the alignment. Modified habitat, that is habitat that has been changed (e.g. agricultural land) or degraded (e.g. un-natural barren land) becomes more frequent towards the southern end of the alignment.

Subproject 2 comprises expansive plains, low relief ridges, valleys, and mountainous foothills. The climate along the alignment is highly seasonal, with two rainy seasons. The district of Rawalpindi along the eastern reaches of the alignment is classed as humid subtropical, with an average annual rainfall 1,200 mm and an average annual temperature of 21.3ºC. However, the climate of Attock along the western reaches of the alignment is semi-arid, with average annual rainfall of 539 mm and an average annual temperature of 22ºC.

The T/L passes through multiple land use classes including agricultural lowlands, forest, barren land, and scrubland. Forests in these regions are largely broad-leaved evergreen scrub forest. The T/L will pass through several forest reserves, most notably the Kala Chitta National Park and the Kheri Murat National Park, but most of the proposed towers are located at lower elevations that are dominated by agriculture. The alignment will also cross multiple watercourses, the largest of which is the Soan River, located south of Ghalwaal, approximately 15 km south of Islamabad. Except for the forest reserves, the T/L lies almost entirely in modified habitat.

Notable and protected species are potentially present along both Subprojects, but the forested mountains and foothills provide the most optimum habitat for such species. The forested land along Subproject 1 and at the eastern end of Subproject 2 is most likely to support wildlife. This area has been subject to the least disturbance compared with the wider landscape, although it is acknowledged that all areas in this region of Pakistan have been degraded by over exploitation and hunting to some degree.

4 Action Plan for Murree Kahuta Kotli Sattian National Park

4.1 Overview of Murree Kahuta Kotli Sattian National Park

The designation of PAs in Pakistan is an important tool in managing the risks to biodiversity in regions such as Punjab and Rawalpindi, where anthropogenic pressures on species and habitats are difficult to reduce in the absence of robust regulatory mechanisms. In 2020 the Pakistan Government launched the 'Protected Areas Initiative', a nationwide programme that aims to increase the coverage of PAs while creating green jobs in the process.

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During the initiative's launch, nine new national parks were announced and six existing, but poorly managed parks were afforded improved resources. One of the named National Parks was the Murree Kahuta Kotli Sattian National Park (MKKS), which is within the scope of this BAP. Under the initiative, the MKKS was highlighted as an area of high nature conservation value, which needed greater protection and enhancement. The initiative also made commitments to help each National Park develop a bespoke management plan with community-led governance, and to provide funds for conservation and management. A new National Parks Service will be established to oversee the initiative and ensure the protection and conservation of the parks.

The MKKS was declared a National Park in 2009 by the Government of Punjab Forestry, Wildlife and Fisheries Department and its extent falls within the Rawalpindi and Punjab regions of Pakistan. It is 57,581 ha in extent and comprises numerous contiguous protected areas including, but not limited to: the Muree Forest Reserve; Kotli Sattian Forest Reserve; Kahuta Forest Reserve; the Gianthal Forest Reserve; Kohatti Forest Reserve; and Pail Protected Forest. The boundary of the MKKS loosely follows the forested foothills and forested mountains and much of it remains forested due to the challenging topography and associated difficult access. It is dominated by chir and scrub forest, which in turn supports many protected and vulnerable species. Despite Punjab and other local provinces having dedicated government departments focused on the protection and conservation of wildlife, the majority of species in the MKKS are unknown. The presence of certain larger species including barking deer, leopard, and several notable bird species have been confirmed but the departments have no data available on their abundance or ecology. Most of the data and information is provided by doctoral students and researchers.

The MKKS was designated for its conservation value and afforded legal protection against development and potentially disturbing activities. However, even with the legal protection, the significant growth in the region's population has resulted in decades of disturbance and degradation. The forest cover, its condition, and the species richness and abundance of the wildlife its supports have all reduced. No direct government funding has been made available. The main threats include:

- Human encroachment including agricultural and industrial expansion and runoff
- Livestock overgrazing
- Tree felling and timber harvesting
- Hunting for sport, meat and trade
- Collection and harvesting of medicinal plants
- Wildfires
- Planting of invasive and non-native species
- Habitat fragmentation

The expansion of livestock grazing into the MKKS is significant. Goats and other domestic livestock outcompete wild species in what are already generally sparse environments. The livestock eat young native plants and suppress the grassland and scrub, and the herds men and women actively scare away and discourage native wild species to protect their livestock. In some circumstances wild animals, including leopard, are killed if they pose a threat to livestock or kill livestock.

Most of the local rural communities rely on wood derived products for heating, cooking, building materials, and as a source of income through commercial sale. With depleted sources of wood in and around their village communities they utilise timber from local forests, including the MKKS. The collection of deadwood, tree felling, and tree harvesting are all common place, particularly in proximity to villages. There are more than 100 villages located within the MKKS and a comparable number within 10 km of its boundary. Over-

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exploitation is often a risk to PAs in such proximity to conurbations, especially with newly designated PAs that previous community usage of sites continues despite the prohibitions of the new legal protection.

Poaching, wildfire, and the harvesting of plants, primarily for medicinal purposes all deplete native species populations. Local communities and the government wildlife departments cite a significant drop in wildlife, particularly larger species, in recent decades. In areas of forest that were filled with large mammals and birds in living memory are now devoid of any such species. Hunting techniques comprise trapping and shooting of wildlife, sometimes to kill wildlife but more frequently to flush animals before subsequent killing or trapping. With low incomes and poor socio-economic conditions in the wider landscape, the reliance on hunting for meat, either to eat or to sell, remains necessary. The warming of the local climate and the degradation of the forest will together also exacerbate pressures on wildlife. Lightning is more likely to start wildfires in dry open habitat devoid of green canopy cover. The harvesting of medicinal plants is likely to affect the ecosystems less, but the scale of the activities and the frequency of the collectors' trips remain a risk.

During the past few decades there has also been a marked increase in industrial development in the area, particularly hydro-schemes and the dredging and extraction of aggregates and minerals from watercourses. These schemes cause significant biological damage to the ecological functionality of the watercourses by altering flow rates and water levels. They also facilitate associated developments such as roads, houses, hotels etc., which lead to further damage and encourage greater encroachment on the MKKS.

Despite the formal legal protection of the MKKS, there is little or no resource to police the legislation and it is understood to be incomplete and ineffective. Further, there is no body accountable for the success of the MKKS or a dedicated management team or structure for management. The proposed National Parks Service is not fully operational, and dedicated government funds for the sustainable long-term management of the MKKS have not yet been released. The day to day management of the MKKS land is distributed between the Forestry, Fisheries and Wildlife departments of Punjab and other local provinces, each with its own remit and competition for resources. Site based rangers carry out day to day monitoring and management on behalf of the procuring local government departments, but administrative duties and financial decisions are carried out by the provincial governments. Different departments manage the same land but for different purposes, and frequently with insufficient staff and resources. This approach has developed iteratively to reflect the government's required authority structure as the growing threats to the area and the available resources continue to increase. There is no singular, holistic or unified management plan or management team that focuses specifically on the MKKS area.

As part of the construction of the Karot Hydropower Project (HPP) in May 2021, the IFC, an investment partner, funded the development of the production of the Murree Kahuta Kotli Sattian Biodiversity Management Plan (BMP). The project proponent is the Karot Power Company Limited (KPCL), a subsidiary of China Three Gorges South Asia Investment Limited (CSAIL), and the implementing partner is the International Union for the Conservation of Nature (IUCN), the Pakistan branch. The Karot HPP project is located on the Jhelum River near the village of Karot, Kahuta Tehsil, in the Rawalpindi district, and is required to achieve a NNL of biodiversity. The development of the first ever management plan for the MKKS was focused on the NNL objectives. The MKKS BMP was approved by the respective regional and local government bodies and published in 2022. It is presented in Appendix 2. It aims to conserve, protect, and restore the biological resources of the Jhelum River Basin and outlines the strategic priorities. The BMP falls short of detailed exact conservation targets as it recognises the existing limitations. Although the BMP was developed with significant stakeholder consultation, the ecological baseline of the MKKS has not yet been studied. The priority geographies, villages, habitats, and species are not known. The BMP is therefore a detailed framework intended to guide the improved management of the MKKS and should be fully reviewed and updated in 2026/27, with iterations completed as knowledge is gained.

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Under the IFC funding the IUCN has fielded 32 members of staff across two field offices, one in Kahuta, Rawalpindi, Punjab, and one in Pallandri. The staff are implementing the first phases of the BMP and comprise a few management personnel but mostly field staff. Together they are responsible for:

- Regular monitoring, protection and reporting of threats and dangerous activities near areas of high aquatic and terrestrial biodiversity
- Preparation of a two-dimensional sediment flow model for protection of fish spawning areas
- Developing the management and planning for enhanced protection and management
- Developing training modules, identifying, and filling gaps in rules and legislation, and conducting training in jobs for communities and staff of government departments
- Managing community and school outreach programmes to promote the awareness of the MKKS protection, biodiversity conservation and improve collaborative within communities
- Developing publicity materials for awareness raising about biodiversity conservation
- Forming the Biodiversity Management Committee (BMC) with representation from government departments, KPCL, IUCN, national experts, and representatives of civil society

The BMP and the establishment of the BMC demonstrates significant steps forward in the long-term and sustainable management of the MKKS. The IFC funding is, however, finite and time limited. The BMP is a framework and must be supplemented with greater clarity, detail and knowledge. The community engagement is limited to the area around the Karot HPP only, and the initial formation of the BMC does not guarantee any significant degree of success.

The timing of the BMP and the time and effort invested by the IUCN to start the BMP's implementation provides, however, a valuable framework and the basis for this BAP. During the past few years, the IUCN have identified several short-term goals, including the need for additional funding, a coordinated management entity, addressing the data deficiency for species, and the formal demarcation of the MKKS boundary.

Other National Parks

The T/L will pass through two other National Parks, the Kala Chitta National Park and Kheri Murat National Park (Figure 1), although almost all the permanent adverse impacts will affect the MKKS. Both National Parks are also subject to broadly similar threats as the MKKS but will be impacted by relatively small sections of the T/L. Further, at the time of writing the BAP, engineers were actively seeking design alternatives that would result in the avoidance of any impacts at all, particularly at the Kheri Murat National Park. The focus of this BAP remains, therefore, on the MKKS with an overarching objective of achieving a NG in the conservation status of National Parks in north-eastern Pakistan.

4.2 Actions for Murree Kahuta Kotli Sattian National Park

The MKKS will be the most significantly affected biodiversity receptor by the Project. 270 towers will be constructed within its boundary, spread across a total distance of 78 km, with each tower requiring approximately 10 m^2 of land. The construction and maintenance of the Project associated roads will enable better access into the forests, particularly the more remote and inaccessible valleys at the eastern end of the T/L in the MKKS. It is therefore reasonable to expect an increase in human activities within the MKKS during and post-construction. The likelihood of increased grazing pressures, the extraction of timber, and the

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foraging for medicines, food and construction materials will result in continuous adverse degradation, possibly at a greater pace than without the Project. Given the local communities existing reliance on the forests and the magnitude of the damage caused to date, the probability of a continuation of such degradation into new areas is high. The severity of this continued deterioration of an already fragile and degraded ecosystem is moderate. This is all in addition to the permanent adverse habitat loss take associated with the construction of the towers.

Given the extent of the MKKS and complexity of its long-term sustainable management, it is not feasible nor proportionate for this BAP to address the degradation and threats alone. It can, however, contribute to the stability and implementation of the MKKS BMP, which has laid foundations for long-term success.

The resources available through this BAP should be targeted and tailored to give the MKKS BMP the greatest chance of success and to provide a high level of NG for the MKKS and its constituent habitats and species. The BAP actions must demonstrate additionality and ensure that the permanent adverse loss of habitat from the T/L towers construction is sufficiently compensated for. The BAP actions proposed for the MKKS have been developed in consultation with the IUCN MKKS team and associated stakeholders specifically to achieve these objectives.

The actions will comprise a partnership with the IUCN MKKS management team, of IUCN Pakistan, and provide financial support with additional resources to improve the governance and management of the BMC and community engagement and awareness in areas under the greatest pressure. The IUCN MKKS management team work collaboratively with the Government of Pakistan at national and provincial levels and are already well connected with communities, academia, and civil society around the Project area.

The first action will target and focus on improving the communication and collaboration between the BMC stakeholders. The MKKS will likely fail as a PA without a dedicated and accountable body to act on its behalf. Research as part of this BAP evidenced that the key government departments, including some who sit on the BMC, are not fully aware of the BMP's objectives or feel isolated. The existing funding for a single annual meeting is insufficient to build the requisite relationships and confidence, develop the right team, and agree strategic priorities and policies. One of the greatest risks to the long-term success of the MKKS BMP is the failure to develop a structured and accountable management team. The IUCN cannot manage the MKKS indefinitely and, as such, significant work is needed to develop a permanent team for the long-term, improve governance and achieve stability. Without Government funding or the formation of the proposed National Parks Service, encouraging and developing a long-term management team with good governance, represents the MKKS's greatest opportunity and chance for success as a PA. When implemented successfully, this will attract significant funding, provide clear leadership and direction, and benefit all habitats, species and communities in and around the MKKS.

The second action will establish a forest enhancement project to offset the permanent land take of the MKKS from the Project. Communities will be involved in the forest enhancement project to support its success through sustainable resource use and forestry management. The second action will also target and focus on improving participatory management with communities and increased MKKS awareness training. Successful community participation and buy-in can significantly reduce existing anthropogenic pressures on biodiversity and simultaneously strengthen conservation efforts. A lack of engagement with local communities often leads to a disregard for the PAs value and objectives and further biodiversity degradation. Community outreach is currently limited to the area close to the Karot HPP. Extending the outreach programme to additional communities, particularly those that are known to rely heavily on the MKKS for goods and services, is currently limited by insufficient funding. The action will seek to achieve a strong social impact by increasing awareness, providing resources and support, and collaboratively develop alternative livelihood options, e.g. restoring forest outside the MKKS. The work is aimed at encouraging local communities away

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from extracting resources from the MKKS, which will indirectly compensate for the loss of habitat from construction of the T/L towers.

Two BAP actions have been developed for the MKKS. They will collectively offset the permanent adverse habitat loss and achieve an overall NG in the MKKS conservation objectives:

1. Improve the governance and management of the MKKS by facilitating and enhancing better collaboration and communication within the MKKS management team.
2. To facilitate forest enhancement and positive engagement with the local communities outside the MKKS boundary.

Details on each action follow.

4.2.1 Action – Governance and Stakeholder Collaboration

Objective

Improve the governance and management of the MKKS by facilitating and enhancing better collaboration and communication within the MKKS management team.

Summary Overview

The MKKS and the associated IUCN MKKS BMP are both nascent, and a permanent management team has not yet been formed. IUCN Pakistan are currently managing the MKKS BMP, via finite IFC funding, but its long-term success is dependent on effective stakeholder and local government collaboration. This will be achieved through a shared vision, joint ownership of the BMP, regularly meetings and discussions, the provision of financing, and resource and knowledge sharing. The Forestry, and Wildlife and Fisheries departments of Punjab and other local provinces join KPCL, IUCN, national experts, and representatives of civil society organisations for Biodiversity Management Committee (BMC) meetings. IUCN Pakistan is the committee secretariat and the BMC's focus on the implementation of the MKKS BMP.

Existing IFC funding allows for one BMC meeting per year between the committee members, which is reported as insufficient to achieve the early collaboration and agreements, and ultimately good governance, required to successfully implement the BMP actions (confirmed via personal communications with IUCN (July 2023)). This BAP action allocates funding for an additional BMC meeting a year for a total of three years, and a new staff member to help facilitate and support.

Conservation Targets

By allocating funding and generating additional meeting time between key stakeholders, the following key targets will be met:

- Increased communication and collaboration between the BMC partners and the continued implementation of tasks and actions within the MKKS BMP
- Better alignment between the BMC partners and achieving a shared vision for the MKKS
- Establishment of a dedicated, sustainably financed, and suitably trained MKKS management team to deliver MKKS conservation outcomes
- Improved conservation outcomes for the biodiversity features targeted by the MKKS BMP (and by proxy the biodiversity features targeted by this BAP)

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Methodology

To meet the conservation targets of this action, the following key requirements must be built into the design of the BMC meetings and, where appropriate, should be integrated into any relevant terms of reference (ToR) and contracts of meeting participants:

- Meetings are to cover the three-year period to begin following finalisation of the Project loan agreement
- One BMC meeting per annum will be funded over that three-year period (resulting in two annual meetings taking place within Q1/Q2 and Q3/Q4)
- The BMC meetings will be chaired by the IUCN as the BMC secretariat
- The meetings should cover, as a priority focus, the effective implementation of the MKKS BMP and include identification of gaps in its successful delivery
- The meetings should cover, as a priority focus, corrective action plans where gaps are identified

The three meetings have been agreed to take place in a different location each year, these final venues should be subject to discussion between organising parties for appropriateness closer to the time:

- The vulture conservation committee which will take place in Lahore, Punjab province
- The other two meetings will either be held in Islamabad or within the MKKS site
- The IUCN Country Representative, MKKS BMP Project Manager and the IUCN Data Analysis and Reporting Officer will be leading the BMC meetings in Lahore, Islamabad and the MKKS site

Attendance of BMC meetings must include representatives of the following parties:

- Punjab and other local government forestry, and wildlife and fisheries departments
- KPCL
- IUCN MKKS management team
- National experts
- Representatives of civil society organisations
- NTDC procured NBS

One month prior to each additional BMC meeting taking place, the IUCN team will notify NTDC of the date, location, and intended attendees. Upon completion of the meeting minutes, the IUCN team will include NTDC in the dissemination of information relating to the meeting to confirm it has taken place.

The full-time employment of one additional staff member will be funded for three years as part of this action to facilitate the meeting and carry out the necessary administrative and documentation management duties. They will be employed by the IUCN MKKS management team and will work with existing IUCN staff members in carrying out the following duties:

- Organising the additional BMC meetings
- Preparing associated documentation
- Inviting attendees
- Managing attendees' time and travel costs
- Assisting in conducting meetings
- Meeting minute taking and reporting
- The dissemination of information following meetings in a timely manner

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- Provide support to the IUCN MKKS project team on a regular basis as required

Opportunities to find financial efficiencies in the budget allocated to fund additional meetings and resources within the year must be explored by the IUCN MKKS team and NTDC to further improve conservation outcomes and coordinated approach between BMC members.

Indicators of Success

The following indicators should be regularly reviewed to track progress of delivery of *4.2.1 Action – Governance and Stakeholder Collaboration:*

- Documented attendance records showing participation in the three additional BMC meetings by: representatives from the Forestry, and Wildlife and Fisheries departments of Punjab and other local provinces, KPCL, IUCN, national experts, representatives of civil society organisations, and the NTDC procured NBS
- Meeting minutes from the three additional BMC meetings clearly describing key discussion points and agreed upon meeting outcomes and next steps. The meeting minutes from each BMC meeting conducted will be provided by the additional IUCN staff member in written form to all attendees, NTDC, NBS, and IBS within one month of the meeting being complete
- Job specifications accepted in writing by suitably trained personnel for the formation of a dedicated MKKS management team. Personnel should be competent professionals appropriate for the delivery of the conservation actions outlined in the MKKS BMP
- Regular (and written) progress reports on the key performance indicators (KPIs) set out in in the Project BMMP relevant to the species of focus within this BAP
- Evidence of additional funding secured for the continuation of annual BMC meetings beyond the three-years
- A written and agreed plan to update the BMP in years 2026/27 with greater clarity and focus on the MKKS governance and its management

A measurable NG for the MKKS has been determined and quantified against the following proposed outcomes:

- Increased BMC meetings from one meeting per annum to two meetings per annum
- Formation of a recognised MKKS management team to include the local government departments
- Increasing the collaboration of stakeholders and the implementation of actions within the current MKKS BMP
- Increase the full time staff members within IUCN Pakistan to manage the MKKS BMP and deliver MKKS conservation actions
- Strengthen the evidence base for how BMC meetings operate and demonstrate the practicalities of how MKKS conservation actions can be informed

Monitoring and Reporting

NTDC must ensure the review of the performance of the above indicators, conducted (as a minimum) bi-annually. NTDC must ensure inclusion of suitably qualified biodiversity professionals in the review of the above indicators (recommended to be the IBS). If the bi-annual review identifies that this action is not achieving its conservation targets, suitably qualified biodiversity professionals (recommended to be the IBS) should be used to identify appropriate adaptive management measures. The setting of adaptive

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management measures should be conducted in consultation with other relevant key stakeholders, including the IUCN MKKS management team.

Any adaptive management measures will need to be reviewed and approved by the ADB.

NTDC are to request the following from the IUCN MKKS management team as per the reporting requirements of this BAP action:

- Written confirmation of the employment of the additional staff member in the form of a signed employment contract within five working days following contract sign off with the employee
- Written notification one month prior to each BMC meeting taking place, to include the date, location, and intended attendees
- A one-page written report from the NBS who will attend all addition MKKS meetings as the Project representative, detailing the attendees, the key actions and any relevant commentary
- BMC meeting minutes, no later than one month following the associated BMC meeting, to confirm the meeting has taken place and the attendee list

NTDC will be accountable for regularly reporting BAP progress to the ADB and the relevant national authorities for the duration of the loan agreement.

Roles and Responsibility

NTDC are ultimately accountable for the implementation of this BAP action.

The IUCN MKKS management team are to receive funds for this BAP action and are considered the responsible party for its effective implementation through its position as BMC secretariat. This role includes undertaking the necessary engagement to secure participation in the meetings by relevant BMC members. It also includes regular updates on this action item to the NTDC.

NTDC are responsible for regularly updating the ADB and the relevant national authorities on the progress of this action in meeting its targets.

More specifically, the following roles and responsibilities are expected to be in place for this BAP action:

- The IUCN MKKS management team Project Lead is responsible for the implementation of this BAP action across the three-year period and is accountable for the IUCN management team if the BAP action were to not be fulfilled. The IUCN Project Lead will be responsible for the additional staff member
- NBS will be in attendance of the additional BMC meetings and will carry out their monitoring and reporting responsibilities
- NTDC (accountable partner) is responsible for receiving evidence of the additional BMC meetings taking place. In the event that the BAP action has not been fulfilled, the NTDC will engage with the NBS and IBS to review the issue and provide adaptive management measures
- IBS (independent authority) is responsible for the review of annual results in line with this BAP and inform progress to the NTDC

Resources

Financial resources are to be provided to the IUCN MKKS management team in annual increments via the NTDC loan fund associated with the Project and the implementation of this BAP.

An itemised breakdown of the indicative cost to implement this BAP action is given in Table 5 below:

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Table 5. Indicative cost to implement BAP action for improved MKKS governance and stakeholder collaboration

Activity/Item	Units Required	Indicative Unit Cost (USD)	Total Indicative Cost (USD)
Meeting cost inc. venue hire charges, stationery, report writing etc.	3	700.00	2,100.00
Travel costs of Punjab and other local province members and staff participants. Note that the IUCN will use its own vehicles for the transport of its own staff, the charge out rate of which has been included in this unit cost. This is inclusive of fuel and driver provision	20	210.00	4,200.00
Boarding and lodging for participants. Unit cost is based on IUCN standard rates from previously held meetings	20	210.00	4,200.00
IUCN staff time (days)	13	230.00	2,990.00
Sub Total			**13,490.00**
IUCN operation charge (5%)			674.50
IUCN management fee (15%)			2,023.50
Total			**16,188.00**

4.2.2 Action – Forest Enhancement and Community Engagement

Objective

To facilitate forest habitat restoration and positive engagement with the local communities outside the MKKS boundary.

Summary Overview

The Project will result in the removal of habitat, and the potential removal of trees, within the construction footprint which requires off-site forest enhancement as compensation. The exact area, habitat quality, and tree quantities and species set to be removed will be defined during pre-clearance surveys. This BAP action covers the facilitation of required forest enhancement alongside increased community engagement to further reduce the pressures of overexploitation on the MKKS and its natural resources. The IUCN have conducted significant local community consultation within the MKKS but have yet to carry out comprehensive consultation with any communities along or near its boundary. The MKKS BMP contains actions involving consultation, education, and afforestation programmes with local communities within the MKKS and outside its boundary. The latter is currently restricted by unavailable finance and this BAP action allocates funding for the implementation of these programmes in the buffer area outside the MKKS. The IUCN have also established tree nurseries and a forest enhancement programme to help engage villages by providing forest and non-timber forest products that, when planted, will discourage the removal of fuel wood from the MKKS through introduction of alternative sources of firewood. This BAP action will support the IUCN in working with villages outside the MKKS that carry out activities within the MKKS that pose a significant threat to its biodiversity value. This action will support the IUCN in working with the communities

to understand the importance of the MKKS through the provision of engagement sessions and long-term management of new planting in a buffer area.

Community engagement will focus on those villages outside the MKKS boundary along the ecologically important tributaries, known as Nallahs, of the Jhelum River.

Conservation Targets

The key targets for this action are as follows:

- Protecting and restoring sufficient natural habitat within the MKKS buffer area (via planting of trees and shrubs, invasive species management, and community engagement), to adequately compensate for quantified project losses, and support the ADB in achieving its NNL and NG target
- Raised awareness amongst local communities of the various benefits of the MKKS, including but not limited to, its biodiversity conservation value and ecosystem services
- Raised awareness amongst local communities of priority conservations actions within the MKKS BMP and how they can contribute
- Increased ownership of the community forests and awareness of how to sustainably manage and harvest their local resources

Methodology

Forest enhancement and community engagement projects will be carried out by the IUCN MKKS management team over a three-year period to begin following finalisation of the Project loan agreement. The IUCN will have on-the-ground presence via their field teams and will be leading the forest enhancement project and data gathering required to work with, and inform, the NTDC nominated contractors.

Forest Enhancement

The IUCN MKKS management team are to select the site(s) for forest enhancement based on stakeholder consultation with local officials, experts, and communities of the MKKS buffer area. The site(s) must be located outside of, but immediately adjacent to, the boundary of the MKKS (i.e. an appropriate conservation buffer area).

Site selection must take place prior to construction activities commencing and the removal of any habitat within the MKKS. NTDC will provide to the IUCN team the results of an assessment to evidence the habitat quality and assemblage of the land set to be permanently lost in the MKKS for the Project. If trees are to be removed, then this assessment will include the quantity and species of trees planned to be removed. The information must be received in a timeframe agreed between the two parties which allows for the forest enhancement project to implement on-the-ground NG focused actions and, for any tree planting taking place, this will need to allow for one growing season prior to the Project trees being removed.

The selection of site(s) for forest enhancement will prioritise those sites that can successfully establish a like for like, or better, habitat quality and assemblage of habitat being lost in the MKKS to support the achievement of a measurable NG for the MKKS. This will require the IUCN team to conduct a site assessment that can demonstrate this is possible. The results of this assessment and site selection are to be provided by the IUCN to NTDC to confirm the selection has taken place and allow for plans to carry out the Project habitat removal works to commence. A site that cannot support like for like, or better, must only be selected if all possible avenues of selecting and securing an appropriate site have been exhausted. The achievement of a measurable NG is calculated using a habitat hectares methodology (see Box 2 below).

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The selection of a site(s) for successful forest enhancement should consider the following activities to achieve a NG for this action:

- Management of existing trees
- Tree planting
- Invasive species management
- Leaving deadwood in-situ
- Management of grazing species
- Installation of fencing and/or signage
- Working with local communities to manage forests sustainably

It must be noted that this list is not exhaustive and the most appropriate activities for forest enhancement will be dependent on the results of the site selection assessment conducted by the IUCN.

Box 2: Habitat Hectares Net Gain Calculation

Approximate area of permanent land take of the MKKS; 270 towers that are to be constructed within the MKKS at 10 m^2 each (the area required for the four tower footings of each structure)

270 x 10 m^2 = 2,700 m^2
2,700 m^2 = 0.27 ha

Recommended multiplier of x20 = 5.4 ha

A x20 multiplier has been applied given the greater benefit that can be achieved for the Project's NG commitments for a similar level of effort based on a lower multiplier. A forest enhancement area of less than the recommended x20 multiplier would provide less opportunities for alternative natural resources for the local communities and may not contribute to a reduction in extraction pressures on the MKKS.

The IUCN team will produce a method statement for each selected site to include the forest enhancement activities planned, relevant maps, roles and responsibilities, exact planting locations, species mix, planting densities, and long-term management and maintenance requirements.

Specific to the tree planting, the method recommended will be appropriate to the species type, age, and root system. The planting method must be in line with internationally recognised methodologies.

Following the confirmation of forest enhancement methodologies and selected site(s) between the IUCN and NTDC, the physical forest enhancement is to be carried out by a suitably qualified and experienced contractor organised by NTDC. The method statement will be provided by the IUCN to NTDC and the nominated contractor.

For tree planting activities, the IUCN should advise the nominated contractor in the sourcing of planting stock and any associated protection materials. Tree species selected must be native and local species of plants, and appropriate for the achievement of a NG for the MKKS and any like for like, or better, in habitat quality and assemblage.

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Following the establishment of the forest enhancement project, the IUCN will manage the project for a period of three years and work with the nominated contractor to maintain the site(s) as required. Following the three-year period, the habitat established should be in a healthy condition to continue its growth without continued maintenance interventions. Any newly planted trees which fail within the three years must be replaced as like for like, unless it can be evidenced that the species is not suitable for that planting plot and a more appropriate native and local species can be planted in its place.

Community Engagement

Community engagement will involve the following elements over a three-year period to begin, following finalisation of the Project loan agreement:

- Six awareness raising, exposure, and training sessions for communities, two per annum
- Three training sessions on forest fires, control, and management for communities and local government departments, one per annum
- Provision of forest fire control equipment to communities and local government departments as part of training session output

A Community Engagement Coordinator will be employed by the IUCN for a three-year period to carry out the elements listed above.

The IUCN field teams will conduct a scoping exercise to identify and confirm the villages to be approached for the community engagement and school outreach programme. The following villages will be prioritised by the IUCN:

1. Kohala
2. Sangal
3. Munasa
4. Basian
5. Patriata
6. Bandhi
7. Birote
8. Sikandarabad
9. Kohati
10. Mirzapur
11. Muslimabad
12. Makrosh

Community engagement will aim to gain the commitment of local political, religious, social, traditional leaders and local community men and women members, as well as local government agencies, NGOs, and cooperatives.

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Forest Enhancement

The following indicators should be regularly reviewed to track progress of delivery of *4.2.2 Action – Forest Enhancement and Community Engagement,* in relation to forest enhancement:

- Enhancement of approximately 5.4 ha of habitat outside of the MKKS boundary as an offset for the permanent land take of approximately 0.27 ha within the MKKS from the Project. Indicators of forest enhancement will depend on the specific activities carried out, these may include, but are not limited to, the area/numbers of existing trees managed, number of trees planted, area/type of invasive species managed, area of habitat protected from grazing species, length/area of fencing installed, quantity and impact of signage installed etc.
- Suitable forest enhancement site(s) within the MKKS buffer area confirmed and mapped (in Project documentation) at least one growing season prior to Project construction activities commencing within the MKKS
- The successful planting of trees to compensate for Project losses
- Evidence to demonstrate trees planted in the buffer area were planted in line with accepted and recognised international methodologies
- Evidence of the establishment of at least 90% of the trees planted in the MKKS buffer area, three years after planting. Trees will be deemed successfully established when they no longer require maintenance to survive

A measurable NG for the MKKS has been quantified against the following proposed outcomes:

- Support the establishment of approximately 5.4 ha of forest enhancement, based on a x20 multiplier, to offset the permanent land take of the MKKS of approximately 0.27 ha
- Increased tree and vegetation cover and subsequent habitat quality in degraded areas outside of the MKKS
- Community engagement in forest enhancement programme

Community Engagement

The following indicators should be regularly reviewed in order to track progress of delivery of *4.2.2 Action – Forest Enhancement and Community Engagement*, in relation to community engagement:

- Meeting records following the completion of six awareness raising, exposure, and training sessions for communities, two per annum over the three-year period by the IUCN MKKS management team
- Training records following the completion of three training sessions on forest fires, control, and management for communities and local government departments, one per annum over the three-year period by the IUCN MKKS management team
- The provision of forest fire control equipment to communities and local government departments as part of training session output that demonstrates the ability to safely manage the anticipated scale of forest fires
- Acceptance of job description by suitably qualified Community Engagement Coordinator by the IUCN for a three-year period
- Evidence of correspondence and engagement between community members and the IUCN MKKS management team in the implementation of conservation actions

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A measurable NG for the MKKS has been determined and quantified against the following proposed outcomes:

- Enhancement of the quality and condition of the forests outside of the MKKS
- Reduction in pressures on the MKKS through alternative livelihoods training and sustainable natural resource usage
- The first set of known community engagement carried out in the target communities on the conservation of the MKKS
- Training for target communities in sustainable forest and fire management

Monitoring and Reporting

NTDC must ensure the review of the performance of the above indicators, conducted (as a minimum) bi-annually. NTDC must ensure inclusion of suitably qualified biodiversity professionals in the review of the above indicators (recommended to be the IBS). If the bi-annual review identifies that this action is not achieving its conservation targets, suitably qualified biodiversity professionals (recommended to be the IBS) should be used to identify appropriate adaptive management measures. The setting of adaptive management measures should be conducted in consultation with other relevant key stakeholders, including the IUCN MKKS management team.

Any corrective action plans will need to be reviewed and approved by the ADB.

Forest Enhancement

The IUCN team will monitor the forest enhancement areas on a quarterly basis for the three-year period. They will report any issues or maintenance requirements to NTDC and the nominated contractor who will subsequently be directed to carry out the necessary maintenance actions.

The NBS will conduct one annual monitoring visit of the forest enhancement areas as an independent body. Within one month of the monitoring visit, a written report will be provided by the NBS to the IBS, IUCN MKKS management team, NTDC, and the ADB. The report must include an assessment of the enhancement actions implemented, including the number of trees planted and their condition if relevant.

If tree planting occurs, then the planting stock procured by the nominated contractor will be checked by the IUCN MKKS management team against the agreed specification prior to planting. The quality of the stock will be checked to improve its chances of success. Poor quality stock must not be planted and must be replaced with stock of expected quality.

The planting will be signed off by the IUCN MKKS management team during an initial inspection visit no more than one week following completion. Any issues found during the initial inspection will be provided in writing to the planting contractor for them to remediate no more than one week following receipt of the issues. A second inspection visit will be carried out by the IUCN team to sign off the remediation visit.

Following the three-year period, the forest enhancement sites should be in a healthy condition to continue without ongoing maintenance interventions. The IUCN quarterly inspections and NBS annual monitoring visits will sign off sites and planting areas as ‘established’ following this principle. Three years is considered sufficient for young forests to establish themselves, or for the contractors to replace any trees, fences, signage etc.

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NTDC are to request the following from the IUCN MKKS management team as per the reporting requirements of tree planting:

- Final version of the forest enhancement method statement prepared prior to any enhancement taking place or stock orders being placed
- Written confirmation of order and receipt of any stock orders by the nominated contractor. Following receipt of stock, a finalised list of species, quantities, and specifications received will be provided prior to enhancement taking place, this can be in the form of an invoice from the stock supplier
- An initial inspection visit report no more than one week following the visit, this will include any issues found which the nominated contractor will be remediating
- Written confirmation that any issues have been remediated within one week of the second inspection visit
- Maps provided, pdf file as a minimum, but ideally in GIS form, to confirm the forest enhancement area locations, including any species mixes, to inform subsequent maintenance visits within one month of the actions being signed off
- Quarterly monitoring visit briefing note to confirm health of the habitats and any maintenance required within two weeks of the visit taking place
- Written confirmation of proposed maintenance actions one month prior to maintenance taking place
- Written confirmation of maintenance visit taking place and the actions carried out within two weeks of the visit
- Final report at the end of the three-year period to sign off the forest enhancement site(s) and propose any subsequent management actions in the event they have not all established

NTDC will be accountable for regularly reporting BAP progress to the ADB for the duration of the loan agreement.

Community Engagement

NTDC are to request the following from the IUCN MKKS management team as per the reporting requirements of community engagement:

- The quantity, estimated population, location, and information on the community demographics to be provided, if known, within two weeks of the villages being scoped and confirmed for engagement
- Training material, including any presentations, one month prior to the associated planned training session
- Written attendance records, including date, time, and venue of all training sessions conducted. No more than one month following completion of the training. Attendance records must be signed by all attendees
- Receipts for the purchase of forest fire control equipment and written acceptance of equipment from the local government departments on a quarterly basis
- Inspection records of forest fire equipment provided on an annual basis. Inspections are to be facilitated by the IUCN team and carried out by a competent person
- Written confirmation of the employment of the additional staff member in the form of a signed employment contract within five working days following contract sign off with the employee
- An annual report demonstrating correspondence with communities engaged with and how the training sessions have led to positive conservation outcomes for the MKKS and/or surrounding areas

NTDC will be accountable for regularly reporting BAP progress to the ADB and the relevant national authorities for the duration of the loan agreement.

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Roles and Responsibility

NTDC are ultimately accountable for the implementation of this BAP action.

The IUCN MKKS management team are to receive funds for this BAP action and are considered the responsible party for leading the planting and community engagement tasks detailed above. This role includes the necessary procurement of a suitable planting contractor, planting stock, and employment of a Community Engagement Coordinator. It also includes regular updates on this action item to the NTDC.

NTDC are responsible for regularly updating the ADB and the relevant national authorities on the progress of this action in meeting its targets.

More specifically, the following roles and responsibilities will be in place for this BAP action:

- The IUCN MKKS management team Project Lead is responsible for the implementation of this BAP action across the three-year period and is accountable for the IUCN management team if the BAP action were to not be fulfilled. The IUCN Project Lead will be responsible for the planting contractor and Community Engagement Coordinator
- NTDC (accountable partner) is responsible for receiving evidence of the tree planting and community engagement actions taking place. In the event that the BAP action has not been fulfilled, the NTDC will engage with the NBS and IBS to review the issue and provide a contingency plan
- IBS is responsible for the review of annual results in line with this BAP and inform progress to the NTDC

Resources

Financial resources are to be provided to the IUCN MKKS management team in annual increments via the NTDC loan fund associated with the Project and the implementation of this BAP.

An itemised breakdown of the indicative cost to implement this BAP action is given in Table 6 below:

Table 6. Indicative cost to implement BAP action for forest enhancement and community engagement

Activity/Item	Units Required	Indicative Unit Cost (USD)	Total Indicative Cost (USD)
Facilitation and management of forest enhancement measures; per annum cost	3	5,250.00	15,750.00
Awareness raising, exposure, and training sessions for communities on biodiversity conservation	6	1,750.00	10,500.00
Training sessions on anticipated forest fires, control, and management	3	3,500.00	10,500.00
Provision of forest fire control equipment to communities and local departments; per annum cost	3	2,917.00	8,751.00
Provision of a Community Engagement Coordinator	1	31,853.00	31,853.00
Office equipment inc. laptop, phone, copier, scanner, fax machine etc.*	1	1,925.00	1,925.00
Processing, management, and development of publications material	1	5,250.00	5,250.00

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IUCN staff time (days)	13	230.00	2,990.00
Transportation cost for field activities	1	10,500.00	10,500.00
Sub Total			**98,019.00**
IUCN operation charge (5%)			4,900.95
IUCN management fee (15%)			14,702.85
Total			**117,622.80**

*Due to auditing requirements, any items purchased under this line item must be returned by the receiving partner to the NTDC following the end of the three-year BAP action period

5 Action Plan for Species

5.1 Overview of Bird Species

Northern Pakistan is inhabited by a wide variety of birds of prey such as vultures, eagles, falcons, kites, and hawks. A survey of birds of prey in Rawalpindi, Islamabad and adjacent areas in 2014 observed that black kites/pariah kites (*Milvus migrans*) and steppe eagle (*Aquila nipalensis*) were the most common birds of prey in the area[1]. Due to habitat degradation and loss, illegal hunting, poisoning from pesticides/insecticides and collisions/electrocution at power transmissions, the general population has declined in Northern Pakistan[2]. The data surrounding birds of prey in Northern Pakistan is also very limited due to the lack of surveys in the area. There is insufficient data regarding their general abundance, nesting sites, and stopover sites. According to multiple surveys, the Egyptian vulture (*Neophron percnopterus*) and white-rumped vulture (*Gyps bengalensis*) have also been observed in the Northern Pakistan area. A research paper in 2019 counted 121 Egyptian vultures (*Neophron percnopterus*) across Northeast Pakistan[3] and 48 white-rumped vultures (*Gyps bengalensis*) were confirmed approximately 50 km east of the Project in the Pir Lasura National Park.[4]

Risks to bird species from T/L projects are generally more significant than for other species due to the height of the permanent infrastructure. High voltage T/L typically pose less risk of electrocution to birds than lower voltage power lines (e.g. distribution lines), mainly due to the size and the spacing between the transmission wires. Nonetheless, most size birds are still at risk of electrocution during a short circuit and large birds, birds with poor manoeuvrability, narrow visual field, or birds that fly at night are particularly at risk of collision.

The design of the infrastructure has subsequently been changed to avoid some risks and mitigation measures implemented to further reduce the risks of either electrocution and collision. No significant impacts on large birds of prey are subsequently expected. However, the IFC PS6 still requires the Project to achieve a NG in the conservation status of any species that trigger critical habitat.

1 Yousaf, N & Manzoor, M. (2014) "A Checklist of Birds of Prey of Rawalpindi, Islamabad and Adjacent Areas", *Journal of Bioresource Management*,1(2): 10-20.
2 Umar, M., Hussain, M., Murtaza, G., Shaheen, F. A., Zafar, F. (2018) "Ecological Concerns of Migratory Birds in Pakistan: A Review", *Punjab University Journal of Zoology* 33(1): 69-76.
3 Kabir, Shamas, U., Ahmad, S., Awan, M. N. (2019) "Population Surveys of Endangered Egyptian vulture (*Neophron percnopterus*) in Mahasheer National Park Kotli, Azad Jammu and Kashmir", *Vulture News*, 77: 55-62.
4 Zangi, I., Mahmood, T., Akrim, F., Nadeem, M. S. (2019) "Spatial Distribution and Population Estimates of Three Vulture Species in and around Pir Lasura National Park, Northeastern Himalayan Region, Pakistan", *Journal of Raptor Research*, 53(2): 164-171.

Three bird species were identified in the CHAs as triggering critical habitat for the Project:

- Egyptian vulture (*Neophron percnopterus*)
- White-rumped vulture (*Gyps bengalensis*)
- Steppe eagle (*Aquila nipalensis*)

5.1.1 Egyptian Vulture

The Egyptian vulture (*Neophron percnopterus*) is the smallest species of vulture and is listed by the IUCN as EN. This species is widespread across Africa, Southern Europe and Asia and its global population is estimated at 12,400 – 36,000 mature individuals. It is also estimated that there are <2,000 pairs in Central Asia and just a few thousand pairs in the Indian subcontinent. They are widely distributed in Pakistan where they are residents of the south-eastern regions and breed in the north-western areas of the country.

The Egyptian vulture typically nests on ledges or in caves on cliffs, crags and rocky outcrops, but occasionally also in large trees, buildings, electricity pylons and on the ground, albeit infrequently[5]. It forages in lowland and montane regions over open, often arid, country, and also scavenges at human settlements. It has a broad diet including carrion, tortoises, organic waste, insects, young vertebrates, eggs and even faeces. Usually solitary, individuals congregate at feeding sites, such as rubbish tips, or vulture 'restaurants' (i.e. supplementary feeding stations), and form roosts of non-breeding birds. The species exhibits high site fidelity, particularly in males.

A 2021 study in the Kotli District, north-west Pakistan, observed 22 roost sites over a seven-year period (2013 – 2019), and between 64 and 131 individuals each year[6]. Ahmad et al. (2021) observed congregation sites located in scrub forest, pine forest, and agricultural land, on rocks, cliffs, and pine trees. Congregation sites averaged 239 m from the nearest human settlement, 1,119 m from the nearest river, 1,273 m from the nearest road, and 2,975 m from the main dumping site near the settlement of Agar Colony. The species has an upper limit of 1,300 – 1,500 m ASL for nesting, however after the breeding season this rises to 2,500 – 2,700 m ASL.

Although the species is understood to not be common in the Project region, with no known breeding sites, they are widely distributed across the country and there is currently a lack of data available as to the extent of presence in the Project AoI. Egyptian vultures are exposed to a variety of threats throughout their range, including nest site disturbance, targeted and accidental poisoning, shooting, collisions, and electrocution at T/L infrastructure and wind turbines[7]. There are opportunities to improve the conservation of the Egyptian vulture with more monitoring and surveys to understand its nesting and feeding behaviours, habitat preferences, and their presence within the Project region.

5 https://www.iucnredlist.org/species/22695180/205187871

6 Ahmad, S., Bari, F., Kabir, M., Khan, T., Khattak, R., Rehman, E. (2021). J. Raptor Res. 55(1), pp. 99-105

7 Botha, A.J., Andevski, J., Bowden, C.G.R., Gudka, M., Safford, R.J., Tavares, J. and Williams, N.P. (2017). Multi-species action plan to conserve African-Eurasian vultures. CMS raptors MOU technical publication, 5, pp.1-164.

5.1.2 White-Rumped Vulture

The white-rumped vulture (*Gyps bengalensis*) is listed as CR by the IUCN, with the total population estimated at 4,000-6,000 mature individuals and only 250-350 individuals in Pakistan.

It occurs mostly in plains and less frequently in hilly regions where it utilises light woodland, villages, cities, and open areas. It feeds on carrion, both putrid and fresh. The white-rumped vulture is a social species usually found in colonies. Of these colonies, breeding colonies are found in tall trees often near human habitation due to the relative abundance of food sources from livestock mortality, and human municipal and agriculture waste.

IUCN and Birdlife list this species as possibly extinct in the Project area, with WWF Pakistan wildlife team sources saying it is functionally extinct in Punjab specifically, but Zangi *et al.* (2019) confirmed the presence of 48 individuals approximately 50 km east of the Project in the Pir Lasura National Park (see Figure 6).[8] This included a vulture roost at Kotli, approximately 25 km east of Subproject 2's eastern end. The research also identified a previously unknown roost further east. Surveys of 23 known colonies in Punjab province (comprising 79,280 square miles, which includes the western banks of the Jhelum River and most of the Project's alignment) in 2006 recorded 37 breeding pairs. The lack of baseline data within the Project area means that the presence of white-rumped vultures cannot be discounted and, given that there is suitable foraging habitat in the wider area, conservation measures could improve habitat for this CR species alongside data gathering on its presence.

Another study from 2019 found approximately 12 individuals at roosting sites near Kotli, which is 30 km from the site, and a further 26 individuals at roosting sites near Nakial, around 40 km from the Project site[9]. This species is known to construct nests close to main roads, likely reflecting the availability of road-killed wild animals. Furthermore, nests recorded by Ahmad *et al*. (2020) were typically close to main rivers and tributaries because effluent and garbage are present which are accessed as food.

Forest fires are a threat to the breeding success of the white-rumped vulture. These fires are often initiated by local people before the onset of spring for agricultural purposes[10]. Poisoning has also been cited as a potential cause of vulture decline [11].

[8] Zangi, I., Mahmood, T., Akrim, F., Nadeem, M. S. (2019) "Spatial Distribution and Population Estimates of Three Vulture Species in and around Pir Lasura National Park, Northeastern Himalayan Region, Pakistan", *Journal of Raptor Research*, 53(2): 164-171.
9 Zangi, I., Mahmood, T., Akrim, F., Nadeem, M. S. (2019) "Spatial Distribution and Population Estimates of Three Vulture Species in and around Pir Lasura National Park, Northeastern Himalayan Region, Pakistan", *Journal of Raptor Research*, 53(2): 164-171.
10 Ahmad, S., Rehman, E., Kabir, M., Bari, F., (2020). Population status and nesting activity of White-rumped vulture Gyps bengalensis in Kotli District, Azad Jammu and Kashmir, Pakistan, Ornithological Science, 19(1), pp. 55-61
11 Khan, M. (2013). Population, breeding and threats to the White-rumped Vulture Gyps bengalensis in Bangladesh. Forktail 29, pp. 52-56.

5.1.3 Steppe Eagle

The steppe eagle (*Aquila nipalensis*) is EN according to IUCN listings. The global minimum population of this species is approximated by the IUCN at 50,000 individuals, although the population within Pakistan is not listed.

It inhabits areas of steppe and semi-desert and is recorded breeding up to 2,300 m ASL in mountainous regions. Its habitat types include, forest, savanna, grassland, rocky areas (e.g. inland cliffs, mountain peaks) and desert.

Nests have traditionally been built as large platforms on the ground, although recent habitat alterations seem to have caused a shift to be building a few metres higher in bushes or trees. It also nests on artificial structures and will occur on rubbish grounds and waste sites. A 2022 study cited human population density (27.0%), chicken density (16.6%), temperature seasonality (11.1%), and rivers (10.3%) as the main environmental factors that affect the habitat distribution of steppe eagle in Pakistan.

The species is migratory, with birds breeding in Russian, Kazakhstan and China and wintering in south-east Africa and southern Asia, migrating at the end of autumn. There have been more than 100 sightings within 100 km of the Project according to eBird and Global Biodiversity Information Facility (GBIF). Further, a study by Bari et al. (2020) identified 159 individuals, including 20 nests along the Jhelum valley, over a two-year study period.

The population is declining due to habitat destruction, particularly the conversion of steppe into agricultural land, livestock overgrazing, persecution, and collisions with power lines.

5.2 Actions for Bird Species

The following BAP actions focus on funding improved monitoring and subsequent knowledge sharing of the bird species which trigger critical habitat for the Project. The BAP actions are designed so that the data gathered from monitoring can be used to inform the conservation of these species. Species focused monitoring improvements over a ten-year period will be contributing to a measurable NG for the bird species as there is currently a lack of baseline data on their presence within the region. Data collected from the monitoring programme will be made available to the IUCN MKKS management team to support the implementation of informed long-term conservation actions from the MKKS BMP. The actions outline the roles and responsibilities of the stakeholders involved and how a measurable NG can be achieved for the species following the construction period and throughout the operation of the Project.

5.2.1 Action – Long-term Bird Monitoring Programme

Objective

Enhance the baseline of, and inform conservation planning for, rare and threatened bird species, white-rumped vulture (*Gyps bengalensis*), Egyptian vulture (*Neophron percnopterus*), and steppe eagle (*Aquila nipalensis*) through a ten-year monitoring programme in and around the MKKS.

Summary Overview

To address the data deficiency for large birds of prey in and around the MKKS, this BAP action allocates funding to the development and implementation of a ten-year monitoring programme focusing on the following BAP target bird species:

- Egyptian vulture (*Neophron percnopterus*)
- White-rumped vulture (*Gyps bengalensis*)
- Steppe eagle (*Aquila nipalensis*)

This BAP action is in collaboration with representatives of the ECON research team who will act as the in-country partners to design and conduct the surveys. The team are experienced in these forms of surveys and have previously completed surveys of the target species in the mountains adjacent to the MKKS, the data of which was used to inform elements of the Project CHA. The surveys will be designed with the support of the IUCN MKKS management team to help align survey output with the bird species focused actions of the MKKS BMP. The data and literature produced by the monitoring programme will be provided to the IUCN MKKS management team to inform their BMP actions. Locally and regionally relevant formal guidance for surveying birds of prey will also be produced to help inform other surveys, further studies, and encourage consistency to influence positive conservation outcomes for the region.

Conservation Targets

The key targets for the ten-year bird monitoring programme are as follows:

- Help address the lack of baseline data on rare and threatened bird species in Northern Pakistan
- Publishing of baseline data by the ECON team within scientific literature
- Creation of formal species-specific guidance to inform conservation actions and consistent monitoring programmes across the region
- Baseline data collected via the monitoring programme made available for the IUCN MKKS management team to inform conservation planning for the MKKS and target bird species
- Baseline data gathering on the occupancy, abundance, and breeding success estimations of target bird species in and around the MKKS
- Inform local conservation actions by gaining insights on the availability of food, including investigation of diet composition and provision of supplementary food, for Egyptian vulture and white-rumped vulture
- Inform local conservation actions by producing estimates of current and future distribution ranges of target bird species under climate change scenarios
- Inform local conservation actions by gathering data on the key threats to target bird species such as electrocution, veterinary non-steroidal anti-inflammatory drugs (NSAIDs) market availability, farmer survey, and local perceptions
- Inform local conservation actions by making data available that can inform strategies to help reduce the risks to target bird species from these threats
- Increase community awareness and capacity building of IUCN MKKS management team staff around key issues related to conservation of target bird species

Methodology

The following methodology is a bespoke approach for this Project, prescribed by the ECON team, following GIP and designed specifically for the ecology of the three bird species in question.

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Based on the recognised breeding season of target species, the ECON research team, led by Dr. Faraz Akrim, will carry out ten surveys per year, one each month excluding July and August. One survey per month will be carried out from January – June and then again from September – December. These will be conducted each year for a ten–year period following finalisation of the Project loan agreement. To aid the explanation of this methodology, the ten-year period of 2024 – 2033 has been used in Table 7 below.

Table 7. The survey schedule of the ten-year bird monitoring programme

Year Ref. No.	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2024	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	✓
2	2025	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	✓
3	2026	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	✓
4	2027	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	✓
5	2028	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	✓
6	2029	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	✓
7	2030	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	✓
8	2031	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	✓
9	2032	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	✓
10	2033	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	✓

It should be noted that the recognised breeding seasons that inform this initial survey schedule are based on the limited understanding of species behaviour. Based on current knowledge and data, the recognised breeding seasons in Pakistan are as follows:

- Egyptian vultures understood to breed during late winter – spring
- White-rumped vulture understood to breed between October – May
- Steppe eagle understood to arrive in September and begins to leave during early February till late March every year. Current understanding is that this species is non-breeding in the Project area

The 'study area' will include the MKKS and a 50 km buffer around the MKKS boundary.

Each survey visit in the month will comprise of three days with four surveyors comprised of:

- Principal investigator
- Research associate
- Two research assistants

The data and literature produced by the monitoring programme will be provided by the ECON research team to the IUCN MKKS management team to inform their MKKS BMP actions. Any costs associated with the transfer and/or delivery of data to the appropriate person(s) will be covered by the ECON research team monitoring budget and not charged back to any other stakeholder. The bird monitoring surveys will involve the following methodologies:

Occupancy Estimation

The study area will be divided into grids of 5 x 5 km^2 with surveys conducted to locate and record presence/absence of Egyptian and white-rumped vultures, hereafter referred to as vultures, and steppe eagle in and around the MKKS.

Survey sites will be selected, following consultation with the IUCN MKKS management team and use of evidence from surveys carried out within the ten-year period. The selection of sites will aim to focus on known areas of presence, feeding sites, roost sites, historical data, anecdotal data, and knowledge of species preferences throughout the study area. Vulture presence at feeding sites will be surveyed, including dump sites, poultry farms, and slaughterhouses. During surveys at the feeding sites, data will also be collected on indirect signs of vulture presence such as accumulated vulture excrement, moulted feathers, and scavenged carcasses.

Each time a vulture or steppe eagle is observed, the GPS location will be taken using a Garmin etrex 10 (or equivalent) handheld geographic positioning device.

Binoculars will be used to detect vultures and steppe eagle. Photographs will be captured of all species observed during the surveys to allow for confirmation of species identification.[12]

The age of species recorded will be estimated as adult or subadult based on size, body colour, body length, and pattern of plumage.[13]

Other data to be collected will include weather conditions, wind speed, temperature, vegetation cover, distance to water source, density of livestock, and density of humans. This data is important as it may influence the occurrence of vultures and steppe eagle and therefore inform more efficient future survey visits.

Species occupancy models will be created using an unmarked package in R software Version 4.2.2. Maps indicating occupancy probability will be generated for the whole study area to help inform targeted conservation actions for species based on known, or likelihood of, presence. These maps will be provided to the IUCN MKKS management team.

Abundance Estimation

Vultures

The monthly, seasonal, and annual abundance of each vulture species will be recorded using the 'colonies count' method following.[14] The study area will be searched to locate the colonies/roost sites of vultures. The vultures at each roost site located will be counted 30 minutes before sunrise until all vultures observed leave the area, and then return from 1600 hrs until sunset when vultures return to the roost site.

[12] Kushwaha, S., and A. Kanaujia (2011) "Observations on migratory and residential vultures in Jorbeer, Rajasthan, India", *Asian Journal of Experimental Biological Sciences*, 2:404–411.

[13] Elosegi, I. (1989) "Vautour fauve Gyps fulvus, Gypaetus barbatus, Neophron percnopterus. Synthese bibliographique at recherches", *Acta Biologica Montana*, 3: 1–278; Forsman, D. (2005) "Steppe Eagle plumages", *Alula*, 1: 2-9.

[14] Xirouchakis, S. M., and Mylonas, M. (2005) "Status and structure of the Griffon Vulture (Gyps fulvus) population in Crete", *European Journal of Wildlife Research*, 51:223–231.

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In addition to counting vultures at the roost site, vultures will also be counted opportunistically should they be observed soaring around the roost site areas or enroute to and from survey sites. Soaring activity is likely to occur during scavenging on carcasses.

Steppe eagle

Current data available reports that steppe eagles are a winter visitor in Pakistan between September – March. A point count method will be used to assess the abundance of steppe eagle in the study area.[15] Data will be collected on the number and age group of wintering steppe eagles from sites selected following consultation with the IUCN MKKS management team and observations made in the field.

Steppe eagles will be recorded at individual survey points within selected sites for 15 – 20 minutes during periods of sunrise and sunset. Ageing of individuals will be based on the criteria developed by Clark (1996), Forsman (2005), Grimmett et al. (2008), and Zuberogoitia et al. (2018).[16] Individuals will be estimated as subadults (up to four years old) or adults (equal to, or more, than five years old). Individuals observed with white wing markings will be identified as subadults, and those with complete brown wings will be identified as adults. Time, and approximate elevation and GPS location of each individual observed will be recorded.

Breeding Success

Vultures

Each roost site identified will be monitored by the research team to identify nests. Trees and cliffs will be searched for nests and colonies, including near to, or within, colonies of other vulture species. Camera traps will be set up at roost sites to capture photographic data, this includes sites even with a single nest. Data on other species during the target species surveys will be collected to further strengthen the biodiversity dataset of the study area.

Observations of nests, breeding status, and general breeding behaviour of vultures will be recorded. To reduce the disturbance of breeding species, cameras will be installed at sites which can be climbed and accessed safely to reduce the need for regular human presence to survey. A drone will be utilised to survey those sites which cannot be accessed safely. A drone will only be flown within a safe distance of the nest and once the adult vulture has temporarily vacated a safe distance away to avoid disturbance of the nest and individuals.

Data will be collected on location, date and time of survey, number of vulture individuals, number of nests, and distance between nests. Following Postupalsky (1974),[17] nests will be categorised as either:

- Active nest: one where vultures are observed building the nest, incubating eggs, or feeding chicks
- Successful nest: one where a fledgling is observed

[15] Huff, M. H., Bettinger, K. A., Ferguson, H. L., Brown, M. J. & Altman, B. (2000) "A habitat-based point-count protocol for terrestrial birds, emphasizing Washington and Oregon", *Gen. Tech. Rep. pnW-GTR-501. Portland, OR: US Department of Agriculture, Forest Service, Pacific Northwest Research Station*, 1-39.

[16] Clark, W. S. (1996) "Ageing Steppe Eagles", *Birding World*, 9: 269-274; Grimmett, R., Roberts, T. J., Inskipp, T. & Byers, C. (2008) "Birds of Pakistan", A and C Black; Zuberogoitia, I., Zabala, J. & Martínez, J. E. (2018) "Moult in birds of prey: A review of current knowledge and future challenges for research", *Ardeola*, 65: 183-207.

[17] Postupalsky, S. (1974) "Raptor reproductive success: some problems with methods, criteria, and terminology", pp. 21–31. In: Hamestrom Jr., F.N., B.E. Harrell & R.R. Olendorff (eds.). Proceedings of the conference on raptor conservation techniques. Fort Collins, Colorado, U.S.A.

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- Abandoned/inactive nest: one where no eggs are observed

The data will be collected in the following tabular format shown by Table 8 below

Table 8. Tabular format for bird monitoring programme nest surveys

Site	Latitude, Longitude	Location of Nest (ref. cliff or tree)	Date	Time	No. of Vulture Individuals	No. of Active Nests	No. of Successful Nests	No. of Abandoned /Inactive Nests

The behaviour of vultures will be monitored in nesting colonies.[18] The location of nests will be confirmed based on fresh nesting materials and evidence of excrement around the cliffs or below trees where the nest is understood to be located. The location of each tree will be noted using a GPS device and they will be marked using tree tags. Other means of identification known to the ECON research team may be used if there is a risk of markers being removed by other parties. For each tree identified with a nest, data will be collected such as tree species, height of tree, height of nest, diameter breast height (DBH) of tree, and whether the branch which the nest is located on is primary or secondary, including whether it is in the crown or on a limb (offshoot growing out of the main trunk).[19]

A drone will be utilised to take pictures of the nest. Pictures taken will be reviewed by the research team to identify whether the nest is active, successful, abandoned/inactive.

Camera trap data will also be used to identify vultures as a 'breeding pair' or 'non-breeding pair'. A breeding pair of vultures will be those with evidence of eggs in a nest, while a non-breeding pair will be those having occupied a nest for at least three weeks but with no evidence of eggs. The breeding success of vultures will be calculated as follows:

$$\text{Breeding success} = \frac{\text{Number of fledglings}}{\text{Number of breeding pairs}}$$

A vulture colony will only be considered as active when it contains a nest with at least one egg.[20]

[18] Postupalsky, S. (1974) "Raptor reproductive success: some problems with methods, criteria, and terminology", pp. 21–31. In: Hamestrom Jr., F.N., B.E. Harrell & R.R. Olendorff (eds.). Proceedings of the conference on raptor conservation techniques. Fort Collins, Colorado, U.S.A.; Acharya, R., R. Cuthbert, Baral H. S. & Shah, K. B. (2009) "Rapid population declines of Himalayan Griffon Gyps himalayensisin, Upper Mustang, Nepal", *Bird Conservation International*, 19(1): 99–107.

[19] Postupalsky, S. (1974) "Raptor reproductive success: some problems with methods, criteria, and terminology", pp. 21–31. In: Hamestrom Jr., F.N., B.E. Harrell & R.R. Olendorff (eds.). Proceedings of the conference on raptor conservation techniques. Fort Collins, Colorado, U.S.A.

[20] Xirouchakis, S. M., and Mylonas, M. (2005) "Status and structure of the Griffon Vulture (Gyps fulvus) population in Crete", *European Journal of Wildlife Research*, 51:223–231.

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Steppe eagle

There are currently no known breeding steppe eagles in Pakistan. The species is known to arrive in Pakistan from September and remain in the country until around February/late March. Its reported breeding season is May – August and so evidence of species during this period will still be confirmed in anticipation of breeding pairs being recorded in Pakistan. The surveys therefore have the potential to confirm the first known breeding steppe eagles in Pakistan.

Food Availability, Diet Composition, and Provision of Supplementary Food

Data on food availability and diet composition will be collected through direct sightings during the survey visits. Target bird species will be observed while consuming their food. Vultures in the area are known to mainly feed on carcasses disposed by local communities, and steppe eagles are known to predate on small mammals, reptiles, and birds. During the breeding season, the selected vulture colonies will be provided with feeding stations, at a supply of 10 kg/month, and the impact of supplementary feeding will be recorded and compared with selected colonies with no supplementary feeding to record any significant differences.[21]

Predicting Current and Future Distribution Ranges

Data collected from the species occupancy estimation surveys will be combined with sources from published literature in the Northern Pakistan region to generate models using the spThin package in R software Version 4.2.2. Bioclimatic data, current and future, will be downloaded from www.worldclim.com at 1 km resolution and will be layered onto the study area and remaining Northern Pakistan region.[22] The global climate change model, the Hadley Global Environmental Model, will be used for the study area and Northern Pakistan region.[23] The land cover, normalised difference vegetation index (NDVI), and digital elevation model (DEM) data will be downloaded from www.earthexplorer.usgs.gov. The DEM data will be used to extract elevation, slope, aspect, hill shade, terrain ruggedness index (TRI), and topographic position index (TPI) in Quantum GIS (Q-GIS) software Version 3.32.1.

Data collected regarding the abundance of prey species, density of dump sites, poultry farms, and slaughterhouses will be converted into raster files in ArcGIS software Version 10.3. All layers will be converted into the same resolution, projection system, and American Standard Code for Information Interchange (ASCII).

Using autocorrelation features in the species distribution modelling (SDM) toolbox in ArcGIS software Version 10.3, the correlation among all raster files will be checked, including the removal of all layers with a

[21] Meretsky V. J. & Mannan R. W. (1999) "Supplemental feeding regimes for Egyptian vultures in the Negev Desert, Israel", *Journal of Wildlife Management*, 63: 107-115; Gustin, M., Giacoia, V., & Bellini, F. (2009) "Establishment of a feeding station near the Laterza LIPU Reserve to provide additional food for three declining necrophagous raptor species in Apulia, Italy", *Conservation Evidence*, 6: 66-70.

[22] Hijmans, R. J., Cameron, S. E., Parra, J. L., Jones, P. G., Jarvis, A. (2005) "Very high resolution interpolated climate surfaces for global land areas", *Int. J. Climatol.: J. R. Meteorol. Soc*, 25 (15): 1965–1978.

[23] Dai, Y., Peng, G., Wen, C., Zahoor, B., Ma, X., Hacker, C. E., Xue, Y. (2021) "Climate and land use changes shift the distribution and dispersal of two umbrella species in the Hindu Kush Himalayan region", *Sci. Total. Environ*, 777: 146207.

correlation of > 0.7.[24] Occurrence locations will be rarefied and be used to create bias files with the SDM toolbox. Maximum entropy modelling will be used to predict current and future distribution ranges of vultures and steppe eagle in Pakistan. The performance of the model will be evaluated based on an Area Under Curve (AUC) statistical score:

- 0.6 – 0.7 = bad
- 0.7 – 0.8 = good
- 0.8 – 0.9 = very good
- > 0.9 = excellent

A maxent will be run with random seed checked jackknife to measure variable importance, regularisation multiplier of one, 10,000 background points, and ten-fold replicates.[25]

The habitat will be categorised by its suitability to support target bird species, as either:

- Not suitable
- Less suitable
- Moderately suitable
- Highly suitable

The current and predicted future suitable habitats identified will be processed in ArcGIS to compute stable loss and gain in the habitat of each target bird species. ArcGIS will be used to generate maps that can be disseminated to the IUCN MKKS management team and used to inform future conservation actions and survey efforts.

Bird Mortality and Threats Monitoring

Data on bird mortality will be collected during each three-day survey visit and utilise numbers of individuals recorded to inform monthly, seasonal and annual trends in vultures and steppe eagles dying due to electrocution. Areas under T/Ls, or other similar powerline structures, will be surveyed in to record and count dead vultures and steppe eagles believed to have electrocution as cause of death. Colonies of vultures recorded during surveys will be checked for presence of dead vultures and the cause of death identified where possible.

A questionnaire survey will be conducted in the villages located in the vicinity of vulture colonies and steppe eagles recorded. The respondents will be asked about livestock holdings, livestock depredation by carnivores, poisoning of carnivores, veterinary practices, and dependency on natural resources. These questions will be asked face-to-face by the ECON research team and are focused on the known non-target species killing of vultures and eagles through use of poisons. Information will be collected regarding the

[24] Brown, J. L. (2014) "SDM toolbox: a python-based GIS toolkit for landscape genetic, biogeographic and species distribution model analyses", *Methods Ecol. Evol*, 5 (7): 694–700; Dai, Y. et al. (2019) "Identifying climate refugia and its potential impact on Tibetan brown bear (Ursus arctos pruinosus) in Sanjiangyuan National Park, China", *Ecol. Evol*, 9 (23): 13278–13293.

[25] Phillips, S. J., Anderson, R. P., Schapire, R. E. (2006) "Maximum entropy modeling of species geographic distributions", *Ecol. Model*, 190 (3–4): 231–259; Kamyo, T., Asanok, L., (2020) "Modeling habitat suitability of Dipterocarpus alatus (Dipterocarpaceae) using MaxEnt along the Chao Phraya River in Central Thailand", *Forest. Sci. Technol*, 16 (1): 1–7.

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method of carcass disposal including species, quantity, cause of death, and disposal location. Data will also be collected on the persecution of vultures and steppe eagle, perceptions, knowledge about the ecological role of vultures and steppe eagle, conservation status, authority responsible for conserving vultures and steppe eagles, agricultural practices, and drugs used for treating livestock such as NSAIDs.

The respondents, expected to include farmers, herders, and veterinary doctors, will be asked about their knowledge of diclofenac, its usage, and its impact on the vulture and steppe eagle populations. A market survey will also be conducted to check on the availability of diclofenac in veterinary and medical stores in the study area.

Data will be collected on the number of carcasses present in the habitats surveyed, including wildlife killed by vehicle collision, and the number, type, and species scavenging on the carcass will be recorded.

Increase in Community Awareness and Capacity Building of IUCN MKKS Management Team

Ten annual seminars, one each year of the ten-year monitoring programme, will be conducted to educate local communities including farmers, herders, schools, college university students, and veterinary doctors in the study area about the ecological role of vultures and steppe eagles and the consequences of a decline in their populations. Alongside these community-based seminars, the same number of meetings will be held with heads of villages to spread awareness and education on the same topics.

Two workshops during the bird monitoring project timeline, one in the first five years and a second in the last five years, will be conducted to train the IUCN MKKS management team on the topics of the bird monitoring programme and any relevant data collection and analysis for the implementation of the MKKS BMP. These two seminars are in addition to the data transfer from ECON to the IUCN MKKS management team required as part of this BAP action.

Indicators of Success

The following indicators should be regularly reviewed in order to track progress of delivery of *5.2.1 Action – Long-term Bird Monitoring Programme:*

- Procurement records that evidence ten, three-day bird monitoring surveys, undertaken per annum for a ten-year period
- Records that demonstrate the new bird baseline data being shared with external parties
- Records that demonstrate the new bird baseline data being shared with targeted and relevant scientific peer-reviewed journals (at least two papers with Dr. Faraz Akrim as lead author in the ten-year period)
- Results of the long-term monitoring programme published in targeted conservation journals and portals, including but not limited to, The Conservation Evidence Journal
- Formal guidance note created describing appropriate survey methodologies for future target bird surveys. Should include the uploading of all analysed data associated with each publication as supplementary data to facilitate others to reproduce the methods and analysis
- Evidence that baseline data has been shared with publicly available online mapping datasets that can be downloaded as free GIS files. The detailed analysis and maps will be shared on the Github platform (https://github.com/) and the ECON main website
- Evidence that baseline data has been shared with the relevant parties in order to allow for it to inform the next iteration of the BMP and increase specific measures for the bird species
- Evidence that baseline data has been shared with the relevant parties in order to allow for it to inform all future survey effort within the ten-year period

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- In the event that other species data is collected during the bird surveys this should be reported on to further strengthen the biodiversity dataset of the study area, and any additional data made available to the IUCN MKKS management team

A measurable NG for the three birds of prey species has been assessed and quantified against the following proposed outcomes:

- Provision of a ten-year monitoring programme for bird species based on a current lack of, to no, known datasets within the MKKS
- Formal guidance on survey methodology to be made available to organisations and institutions to implement a tried and tested methodology and further contribute to the species dataset and positive conservation outcomes
- Provision of data to the IUCN MKKS management team to inform their bird species focused conservation actions and iterations of subsequent MKKS BMPs
- Data sharing to organisations and institutions that do not have the resources to carry out such surveys and can utilise the data to inform additional conservation benefits
- Contributing to scientific literature and content within peer-reviewed journals that can benefit wider conservation

Monitoring and Reporting

A review of the performance of the indicators of success should be conducted bi-annually by the NBS and reported to NTDC. NTDC must, in turn, ensure regular communication of the results to the ADB.

NTDC must ensure inclusion of suitably qualified biodiversity professionals in both the review of the above indicators and the setting of adaptive management measures in the event that this action is not achieving its desired outcomes. The setting of adaptive management measures should be conducted in consultation with other relevant key stakeholders including the ECON research team and the IUCN MKKS management team.

Any corrective action plans will need to be reviewed and approved by the ADB.

ECON research team lead must contact the IUCN MKKS management team lead two weeks prior to a survey being undertaken, on the first day of a survey, and one day after each survey is completed. An IUCN MKKS team member and the independent technical advisor, Dr. Tariq Mahmood, will join at least two survey visits per annum.

Data from the surveys is to be provided free of charge to the IUCN MKKS management team as an additional conservation outcome. This includes the publicly available guidance on replicating bird surveys and any freely available literature regarding the monitoring programme.

Provision of baseline ecological data must be in an industry recognised ecological reporting format, such as maps or tabular, and interpreted to allow it to be applicable in informing IUCN MKKS BMP conservation management actions.

Survey data must be sent to the IUCN management team ideally within one month of the survey being complete, and no later than three months following the relevant survey. This will help to support the timely use of data to inform tangible conservation actions by the IUCN team. Due to the anticipated file size of the dataset, it is likely the data will be made available via the sharing of a Google drive link.

All questionnaires used for community engagement are to be reviewed and approved by the IUCN team and NTDC to ensure sensitive/confidential information is correctly controlled.

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NTDC are to request the following from the IUCN MKKS management team as per the reporting requirements of this BAP action:

- Monthly survey updates provided by the ECON research team, to include evidence of surveys taking place such as pictures and sample survey data. The monthly survey updates do not require full findings report, but is evidence showcasing that the ECON research team are conducting their monthly surveys according to the required schedule
- Written confirmation within one week of receiving data from the ECON research team
- An annual report compiled by the ECON research team to be provided in Q1 of the following year that the associated annual set of surveys were completed. The annual report must include details regarding all the bird monitoring surveys carried out that year and be supported by objectives, methods, results containing distribution maps, analysis outputs, data tables and relevant figures, photographic evidence, discussion, outcomes, literature cited, key findings, and recommendations. The report must also confirm that the IUCN MKKS team have received the data and if any of it has been used to inform positive conservation actions
- Receipt of drafts for review two weeks prior to the intended upload/publishing of any web content, formal guidance, or literature using data collected from the bird monitoring programme
- Copies or links to websites of any uploaded web content, formal guidance, or published literature that has been created using data collected from the bird monitoring programme within one week of being uploaded/published.

NTDC will provide the NBS with all monthly updates and annual reports for technical review.

NTDC will provide the IBS with all annual reports for technical review.

NTDC will be accountable for regularly reporting BAP progress to the ADB and the relevant national authorities for the duration of the loan agreement.

Roles and Responsibility

NTDC are ultimately accountable for the implementation of this BAP action.

The ECON research team and the IUCN MKKS management team are to receive funds for this BAP action and the latter are considered the responsible party for leading the tasks detailed above. The ECON research team are the responsible party for the delivery of the monitoring programme on-the-ground and are accountable to the IUCN MKKS management team. Therefore, the IUCN team are responsible for regular updates on this action item to the NTDC.

NTDC are responsible for regularly updating the ADB and the relevant national authorities on the progress of this action in meeting its targets.

More specifically, the following roles and responsibilities will be in place for this BAP action:

- The IUCN MKKS management team Project Lead is responsible for the implementation of this BAP action and is accountable for the IUCN management team if the BAP action were to not be fulfilled
- Dr. Faraz Akrim (ECON research team lead) is responsible for the delivery of the monitoring programme on-the-ground and the reporting requirements to the IUCN MKKS management team for the duration of the ten-year bird monitoring programme. Dr. Akrim will be responsible for the recruitment and management of all ECON research team personnel, and the delivery of all field work, data collection, data analysis, report writing, and publications. Dr. Akrim will also be responsible for the engagement of Dr. Tariq Mahmood (see below).

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- Dr. Tariq Mahmood (independent technical advisor), Associate Professor at PMAS-AAUR Zoology Department, is responsible for reviewing the monthly updates and the quality of surveys being carried out from a technical perspective prior to submission to the IUCN MKKS management team
- NTDC (accountable partner) is responsible for receiving evidence of the bird monitoring programme actions taking place. If the BAP action has not been fulfilled, the NTDC will engage with the NBS and IBS to review the issue and provide a contingency plan
- IBS (independent authority) is responsible for the review of annual results in line with this BAP and inform progress to the NTDC

Resources

Financial resources are to be provided to the ECON research team and the IUCN MKKS management team in annual increments via the NTDC loan fund associated with the Project and the implementation of this BAP.

Funds under this BAP action will be made available to two different BAP partners:

- ECON research team
- IUCN MKKS management team

Itemised breakdowns of the indicative costs to be transferred to these two partners for the implementation of this BAP action are given below in Table 9 for the ECON research team and Table 10 for the IUCN MKKS management team:

Table 9. Indicative cost for ECON research team to implement their role in the BAP action for long-term bird monitoring programme

Activity/Item	Units Required	Indicative Unit Cost (USD)	Total Indicative Cost (USD)
Salary for Project Lead: Dr. Faraz Akrim, annual cost as honorarium for role	10	170.00	1,700.00
Salary for Research Assistant required during the project to assist with field surveys, billing, seminars, and report writing on an annual cost basis	10	600.00	6,000.00
Local travel cost for each set of annual survey visits consisting of ten three-day survey visits per annum	10	860.00	8,600.00
Food and accommodation for four survey team personnel for each set of annual survey visits: Project Lead, Research Assistant and Research Field Assistants	10	690.00	6,900.00
Equipment – Digital camera: Canon/Nikon digital camera with 50x zoom (bundle). Required for capturing photos of target species and habitat during field surveys*	1	276.00	276.00
Equipment – Laptop: 12/14 core processor i7/M2/M3, 16 GB ram/512 storage. Required for maintaining the project related data, data analysis, and report writing*	1	1,380.00	1,380.00

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Equipment – Printer: HP laser jet printer. Required for printing the project related documents inc. bills, reports etc.*	1	175.00	175.00
Equipment – Camera traps: Camera traps with 0.2ms trigger speed (bundle). Required for collection of breeding data inc. capturing photographs of nests/eggs/hatchlings etc. during the breeding season. Any additional camera traps required can be procured by the ECON research team via other sources of finance outside of this BAP*	5	207.00	1,035.00
Equipment – GPS devices: Garmin etrex 10. Required for collection of location data during field surveys for maps and data analysis*	1	207.00	207.00
Equipment – Binoculars: Nikon 8-18 x 42 or similar. Required for observation of target species during field surveys*	1	173.00	173.00
Equipment – Drone: DJI Mavic Mini. Require for observation of inaccessible nesting sites during field surveys*	1	862.00	862.00
Seminars – Ten seminars, one per annum, for increasing awareness among local communities about the target species in the study area	10	103.45	1,034.50
Workshops – Two workshops for capacity building within IUCN MKKS management team on data collection and analysis	2	345	690.00
Consumables/supplies – Rechargeable batteries: Camelion 2700 mAh. Required for camera traps and GPS	40	7.59	303.60
Consumables/supplies – Stationery: A4 paper, pencils, sticky notes, highlighters, notepads. Required for office work inc. billing, report writing etc.	10	86.00	860.00
Printing of community engagement and awareness raising material inc. booklets and brochures	1,000	1.21	1,210.00
Annual cost for supplementary diet feeding for vultures and steppe eagle	10	172.41	1,724.10
Contingency fund per annum to cover unforeseen expenditure and/or inflation	10	200.00	2,000.00
Sub Total			**35,130.20**
Institutional cost at the end of the project (2%)			702.60
Total			**35,832.80**

*Due to auditing requirements, any items purchased under this line item must be returned by the receiving partner to the NTDC following the end of the ten-year BAP action period

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Table 10. Indicative cost for IUCN MKKS management team to implement their role in the BAP action for long-term bird monitoring programme

Activity/Item	Units Required	Indicative Unit Cost (USD)	Total Indicative Cost (USD)
IUCN cost for coordination with ECON and communities, including time required for processing and management of data	1	5,498.00	5,498.00
Sub Total			**5,498.00**
IUCN operation charge (5%)			274.90
IUCN management fee (15%)			824.70
Total			**6,597.60**

5.3 Overview of Fish Species

Six fish species were identified by the Project CHA to trigger critical habitat under IFC Criterion 1 and 2. These are listed below:

- (no common name) (*Glyptothorax kashmirensis*)
- (no common name) (*Triplophysa kashmirensis*)
- (no common name) (*Glyptothorax punjabensis*)
- Bhed catfish (*Glyptothorax stocki*)
- (no common name) (*Barilius naseeri*)
- (no common name) (*Paraschistura prashari*)

These species have triggered critical habitat due to having a highly restricted range, with more than 0.5% of the global population likely being contained within the Project AoI. In some cases, these local populations are the only known populations globally. The fish species included in the CHAs all have highly restricted ranges, less than 50,000 km^2, and most significantly less than that. They are distributed along the Project alignment and occupy higher elevation fast-flowing streams and rivers in the mountains at the northern end of Subproject 1, and the wider slow-flowing rivers and lakes at lower elevations south-west of Islamabad. The BAP is responsible for ensuring the net gain of these six species.

Although the six fish species are technically within the Project AoI, due to their relatively long distance from the immediate construction footprint, they are not anticipated to be significantly adversely impacted from the Project. The Project will not construct any towers or associated infrastructure in any significant waterbodies, nor will any construction occur within 50 m of a watercourse. Furthermore, the Project will be designed to avoid and reduce indirect impacts where possible that may affect the watercourses. This includes specific actions to control water extraction, pollutants, dust deposition, piling and vibration, and material and aggregate extraction.

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5.4 Actions for Fish Species

As it is unlikely for the T/L to have any adverse impact on the six fish species, this BAP has not included any specific actions for their net gain. A demonstrable net gain can be achieved indirectly for the fish via the MKKS focused BAP actions and the provision of additional conservation outcomes through additional BMC meetings, the formation of a dedicated MKKS management team, and engagement with communities along the Jhelum River tributaries.

These actions will allow the further implementation of actions within the MKKS BMP, some of which are focused on the specific conservation of fish species and improved water quality management within the MKKS. For example, the preparation of two-dimensional sediment flow model and sustainable mining plan to manage sediment mining activities for the protection of fish spawning areas.

Indicators of Success

The indicators of success for the additional conservation outcomes for the six fish species include:

- IUCN MKKS management team to demonstrate to NTDC a net gain in the population numbers of critical habitat trigger fish species based on direct actions implemented from the additional BMC meetings within three-years
- IUCN MMKS management team to demonstrate to NTDC that community engagement funded through this BAP has led to measurable improvements in community led conservation of critical habitat trigger fish species and their habitat
- Measurable improvement in water quality of the aquatic habitats of the MKKS which the critical habitat trigger fish species inhabit

The adverse residual impact for the fish species within this BAP scope has been assessed as negligible. The achievement of a measurable NG for the biodiversity features within this action have been quantified against the following proposed outcomes:

- Supporting the implementation of the MKKS BMP which has actions focused on fish species conservation
- Formation of a recognised MKKS management team to deliver MKKS BMP actions, some of which are focused on fish species conservation
- Community engagement with villages located along the Jhelum River to support sustainable water resource use

Monitoring and Reporting

A review of the performance of the indicators of success should be conducted bi-annually by the NBS and reported to NTDC. NTDC must in turn ensure regular communication of the results to the ADB.

NTDC must ensure inclusion of suitably qualified biodiversity professionals in both the review of the above indicators and the setting of adaptive management measures in the event that this action is not achieving its desired outcomes. The setting of adaptive management measures should be conducted in consultation with other relevant key stakeholders including the IUCN MKKS management team.

Any corrective action plans will need to be reviewed and approved by the ADB.

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Annual reports submitted by the IUCN as part of their responsibilities within Actions 4.2.1 and 4.2.2 must include information on the additional conservation outcomes achieved for the fish species.

NTDC will be accountable for regularly reporting BAP progress to the ADB and the relevant national authorities for the duration of the loan agreement.

Roles and Responsibility

The following roles and responsibilities will be in place for this BAP action:

- The IUCN MKKS management team Project Lead is responsible for the implementation of IUCN led BAP actions across a three-year period and is accountable for the IUCN management team if the BAP action were to not be fulfilled
- NTDC (accountable partner) is responsible for receiving updates and reports, and will engage the NBS and IBS as is appropriate for this. In the event that the BAP action has not been fulfilled, the NTDC will engage with the NBS and IBS to review the issue and provide a contingency plan
- IBS (independent authority) is responsible for the review of annual results in line with this BAP and inform progress to the NTDC

6 BAP Monitoring and Adaptive Management

When approved and financed, a BAP becomes a legal document and its commitments become the legal responsibility of the named organisations. It is also best practice for a BAP to be a live document and for its actions to be active and managed in perpetuity. The BAP should be monitored regularly, as per IFC PS6 requirements and to track progress of this BAP's actions in achieving the ADB's requirements of NNL and NG to biodiversity. Knowledge gained as the BAP actions are delivered may identify opportunities for improving the BAP. Conversely, BAP actions may need to be updated in order to be effective in achieving their desired outcomes. Adaptive management is a key element of this BAP given the inherent uncertainty in biodiversity management, especially across the long-term scale expected from this BAP.

A BAP monitoring and adaptive management plan will be required and should be designed with the primary focus of reviewing Project progress towards achieving the ADB requirements of NNL and NG to biodiversity. Should deviations from this BAPs intended conservation targets be identified, appropriate adaptive management measures will be required to bring the BAP back into line with the ADB's requirements. Adaptive management measures should be inclusive of clearly defined roles, responsibilities, costs, methodologies etc. The actions contained within this BAP involve numerous stakeholders over many years to be successful. Defining adaptive management measures should be undertaken as a multi-stakeholder process and all adaptive management measures will need to be reviewed and approved by the ADB.

Key stakeholders have been tasked to review and assess the annual progress of each action and communicate the results to NTDC, who will remain accountable for the duration of the operational Project. A monitoring team will need to review the progress of the actions against the documented conservation targets and indicators of success. The monitoring team will comprise the PMU for the duration of construction or the NTDC during operation and the International Biodiversity Specialist (IBS) who must be contracted by the NTDC and available to advise on their behalf for a minimum of five years post-construction. The IBS would be expected to call on the NBS and any other ecological expertise as required, dependent on the issue at hand.

The basic principles of the BAP monitoring and adaptive management plan are:

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- Each implementing partner must provide the results of each separate action to the NTDC on a biannual basis with a comprehensive final report at the end of each year, for the entire duration of the action
- Following the second year of the Project, the contracted IBS/NBS must do a holistic review of each BAP action to review progress towards the effectively achieving or contributing net gain. This would ensure that the IBS/NBS can identify if the BAP action has not fulfilled its long-term objectives or is not on track to achieve those objectives and inform adaptive management measures, as required
- Additionally, the NTDC and their contracted IBS/NBS must conduct a milestone review of the state of each BAP action at the end of the fifth and tenth year of the Project. The fifth and tenth year are especially important as the fifth year marks the end of construction and is the mid-way point of the ten-year bird monitoring programme. The tenth year would mark the end of the bird monitoring programme and the end of IBS/NBS's contract with the NTDC. Similar to the point above, the purpose of these milestone reviews is to evaluate the overall success of each BAP action and determine whether it is on track to achieve its long-term objectives
- The NTDC must report to the ADB regarding the state of each BAP action. The regularity/timing of reporting will be dictated by the ADB. The report must include a succinct summary of the progress/status of each BAP action and must be supported by evidence if available
- NTDC must have the internal capacity to contract an IBS/NBS for the entire duration of construction and a minimum of five years after construction finishes. The IBS must have a minimum of 15 years working in biodiversity conservation, with experience working on major international projects and in working with international E&S standards such as IFC Performance Standards and ADB SPS. The NBS must have a minimum of 10 years working in ecology of the Northern Pakistan region, ecological survey experience, ability and flexibility to travel to the BAP action sites as required, and be suitably qualified and experienced to ensure successful delivery of the BAP. Upon the receipt of annual reports from each implementing partner, the IBS/NBS must evaluate the results of each BAP action and determine whether they have fulfilled their objectives with sufficient quality
- Depending on the quality of the results, the IBS/NBS contracted by the NTDC will determine whether any adaptive management measures are needed
- If any adaptive management measures are required, the NTDC must develop adaptive management measures with detailed recommendations through the services of the contracted IBS/NBS. Additionally, species-specific expertise may also be required when defining adaptive management measures, and the NTDC should expect to have to contract such expertise as and when required. The recommendations will subsequently be shared in writing with the implementing partner and the ADB for discussion, refinement, and finally acceptance

The timeline for the monitoring plan is:

- Each implementing partner must present the results of their work to NTDC within four weeks of the end of each implementing year (taken to be twelve months from contract approval and project inception)
- The NTDC must report to the ADB regarding the state of all BAP actions, with the regularity of reporting being dictated by the ADB
- The contracted IBS/NBS must review the results and provide written acceptance or declare if adaptive management measures are required to the NTDC, and they will inform the implementing partner and the ADB of the decision made within four weeks of receipt of the results
- If adaptive management measures are deemed necessary, the NTDC will instruct the IBS/NBS in writing to develop adaptive management measures with detailed recommendations within five working days of issuing their decision to the implementing partner and the ADB. The IBS/NBS will present their recommendations in writing to the implementing partner and the ADB within six weeks of receiving their instructions
- The adaptive management measures must receive approval from the implementing partner and the ADB before implementation
- At the end of the fifth year of the Project, a milestone review will be conducted by the contracted IBS/NBS on behalf of the NTDC. The IBS/NBS must provide written acceptance or declare if adaptive

management measures are required to the NTDC, and they will inform the implementing partner and the ADB of the decision made within six weeks of receipt of the results

The cost of the IBS's/NBS's first five years must be accounted for in the construction costs. The BAP must include budget for the retention of the IBS/NBS by the NTDC for a minimum of five years after construction finishes. It is also recommended that the BAP includes a contingency fund in case the IBS's/NBS's costs are greater than planned (e.g. multiple action failures requiring multiple recommendations to be developed) or if the adaptive management recommends require additional resources. See Table 11.

Table 11. Adaptive management contingency actions

Accountability	Activity	Units Required	Indicative Unit Cost (USD)	Total Indicative Cost (USD)
NTDC	The services of an International Biodiversity Specialist (IBS) for five years after construction	5	5,000	25,000
NDTC	The services of a National Biodiversity Specialist (NBS) for five years after construction	5	5,000	25,000
NTDC	Adaptive management Contingency	1	100,000	100,000
Total Indicative Cost				**150,000**

6.1 Thresholds and Indicators

During the BAP's ten-year programme, it will be subject to a large variety of external variations including, but not limited to, changes in weather, changes in available resources, political developments, and changes in external funding. It is therefore not feasible to detail every possible deviation or change that may trigger the need for adaptive management, but a selection of potentially likely triggers is introduced below:

Governance and Stakeholder Collaboration:

A key factor in the success of this action is the attendance of key stakeholders which would lead to the formation of an MKKS management team and the implementation of positive conservation actions. Discussion points within the BMC meetings must prioritise measures to help the implementation of MKKS BMP actions. The thresholds for adaptive management must include:

- The successful completion of at least two BMC meetings per annum
- A representative from the named entities must be present. This must prioritise attendees from the local government departments. If key stakeholder representatives are not present, then a valid reason must be provided to NTDC, or adaptive measures must be put in place to help resolve the issue. This may involve the use of video-conferencing, a change of meeting location, date, transport type etc.

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- Following the receipt of meeting minutes from each BMC meeting, if the meetings are not adequately demonstrating a prioritisation in measures to help the implementation of MKKS BMP actions, then this would be a justification for initiating adaptive management. Measures to prioritise would include the formation of an MKKS management team, species focused actions, MKKS BMP featured actions, support for further BMC meetings etc.
- By the end of year two, it must be demonstrated that an MKKS management team can be formalised by the end of year three
- At least two conservation actions for the MKKS influenced by the BMC meeting must be demonstrated per annum. If this is not the case, then adaptive management measures should call into question the effectiveness of these meetings for implementing conservation actions

Forest Enhancement and Community Engagement:

A key factor in the success of this action is the monitoring of activities implemented for the forest enhancement project. Ensuring all training sessions as part of community engagement are taking place is also a key factor. The thresholds for adaptive management must include:

- The selected forest enhancement site(s) cannot demonstrate a like for like, or better, in habitat quality and assemblage from the habitat being lost within the MKKS
- A forest enhancement site(s) not being selected in time to allow at least one growing season prior to the habitat being lost in the MKKS from the Project
- The minimum forest enhancement hectarage of 5.4 ha not being selected
- Method statement for forest enhancement activities submitted must demonstrate net gains can be achieved prior to the enhancement activities commencing
- A tree loss rate of planted trees below 90% as monitored at the end of each year
- All community engagement training sessions must be carried out in the listed per annum quantities

Long-term Bird Monitoring Programme:

A key factor in the success of this action is the provision of data to the IUCN MKKS management team to inform their bird species focused MKKS BMP actions. The use of data collected to produce formal guidance on replicating the surveys and to publish literature in peer-reviewed journals is another key factor. The thresholds for adaptive management must include:

- Surveys not being carried out in the frequency detailed within the BAP action must trigger adaptive management as this is key to providing a robust dataset and repeatable methodology. If a survey is missed, then appropriate measures must take place to ensure an alternative survey date is organised to avoid missing the annual total of ten surveys expected. Reasons for missing surveys must be provided by the ECON research team to the IUCN and NTDC teams to ensure support is given to resolve any issues so they are not ongoing and cause more surveys to be missed
- If no research informed by the monitoring programme data has been submitted to a peer-reviewed journal within the first five-years
- Target bird species populations demonstrated to be in decline for three consecutive years
- Bird monitoring programme data must be provided annually to the IUCN MKKS management team
- The IUCN MKKS management team to demonstrate at least one MKKS BMP action has been influenced by data provided, and outputs produced, by the ECON bird monitoring programme every two years for the ten-year period

Additional Conservation Actions for Fish Species:

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A key factor in the success of this action is the establishment of a formal MKKS management team to implement actions from the MKKS BMP, some of which are focused on fish species scoped within this BAP. Community engagement with villages along the Jhelum River is another key factor. The thresholds for adaptive management must include:

- Actions for the BAP fish species must be discussed and evidenced within the BMC meeting minutes
- Community engagement training sessions must feature topics regarding sustainable water resource management and the conservation of the BAP fish species
- The IUCN MKKS team must demonstrate at least one action per annum that can demonstrate positive conservation outcomes for the BAP fish species

7 Indicative Costs

The implementation of this BAP will only take place once the Project is live and funded, which is reliant on the overall Project being approved by the Government of Pakistan and the ADB. This is anticipated to be in late 2023 or early 2024.

The indicative costs for the delivery of this BAP have been determined in collaboration with the following BAP action implementation partners:

- IUCN
- ECON

Following agreement of costs with the BAP partners above, they were presented to the ADB as the client on behalf of NTDC, the party accountable for the implementation of the BAP. All costs have been approved by the ADB and the necessary stakeholders.

Indicative costs account for an annual increase of 5% based on inflation.

As part of the loan agreement, NTDC will be in receipt of all funds from the ADB required to implement this BAP as summarised in Table 12 below.

Table 12. Summary of indicative costs to deliver the BAP actions

BAP Action Summary	Responsibility	Total Indicative Cost (USD)
Governance and Stakeholder Collaboration: Improvement of governance and management structure of the MKKS through stakeholder collaboration and the funding of one additional Biodiversity Management Committee (BMC) meeting per year for a total of three years (2024 – 2026). This includes funds to employ one additional staff member to facilitate and support the additional BMC meetings.	IUCN Pakistan (implementation lead); NTDC (accountable party); ADB (lender)	16,188.00

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Forest Enhancement and Community Engagement: Funding of an IUCN led forest enhancement project to offset the permanent land take of the MKKS from the Project. Enhancement of habitat quality at a x20 multiplier of hectares removed, calculated at approximately 5.4 ha of enhancement required. This action will also support the IUCN in community engagement and schools outreach programmes in villages outside of the MKKS boundary to raise awareness about its importance and further support MKKS conservation efforts.	IUCN Pakistan (implementation lead); NTDC (accountable party); ADB (lender)	117,622.80
Long-term Bird Monitoring Programme: Funding of ten-year bird monitoring programme, to include ten three-day surveys per annum and community engagement. Surveys to be carried out by the Ecosystems Conservancy (ECON) research team. Survey data to be made available to the IUCN MKKS management team to inform conservation actions for the MKKS.	ECON (research lead); IUCN Pakistan (implementation lead); NTDC (accountable party); ADB (lender)	42,430.40
Additional Conservation Actions for Fish Species: Through the formation of a dedicated MKKS management team and engagement with communities along the Jhelum River tributaries, additional conservation outcomes will be achieved for the six fish species that trigger critical habitat.	IUCN Pakistan (implementation lead); NTDC (accountable party); ADB (lender)	Cost covered by the long-term bird monitoring programme IUCN management costs
Monitoring and Adaptive Management: Costs associated with the procurement of the NBS and IBS services as per the requirements of this BAP and the basic principles of the BAP monitoring and adaptive management plan. This cost also includes an adaptive management contingency fund	NTDC (accountable party); ADB (lender)	150,000.00
Total Indicative Cost		**326,241.20**

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8 Appendices

8.1 Appendix 1 – Stakeholder Consultation List

Full list of stakeholders contacted and engaged with during the consultation process of this BAP.

Name	Company/Institution	Role	Reason(s) for Consultation
Dr. Faraz Akrim	Ecosystems Conservancy (ECON), Islamabad; Pir Mehr Ali Shah Arid Agriculture University Rawalpindi (PMAS-AAUR), Pakistan	Head of Research and Development, ECON, Islamabad; Department of Wildlife Management, PMAS-AAUR, Pakistan Member of the International Union for the Conservation of Nature (IUCN) SSC Pangolin Specialist Group, IUCN SSC Small Carnivore Specialist Group, Society for Conservation Biology (Asia Section), and Biodiversity Professionals	Specific interest in the vultures and approached as a potential BAP partner (contacted 4th July 2023); Bird monitoring programme lead
Dr. Imad-ul-din Zangi	PMAS-AAUR	Survey Specialist	Specific interest in the vultures (contacted 4th July 2023)
Dr. Tariq Mahmood	PMAS-AAUR	Associate Professor	Specific interest in the vultures (contacted 4th July 2023)
Dr. Muhammad Kabir	University of Haripur	Lecturer	Specific interest in the bird species (contacted 4th July 2023)
Dr. Fathul Bari	University of Chitral	Lecturer	Specific interest in the bird species (contacted 4th July 2023)
Shakeel Ahmad	Quaid-i-Azam University	PhD Scholar	Specific interest in the bird and fish species (contacted 4th July 2023)
Chris Bowden	IUCN Vulture Specialist Group, Asia	International Species Recovery Officer & SAVE Vulture Programme Manager	Specific interest in the vultures (contacted 5th July 2023)

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Mr. Asim Jamal	IUCN	Project Manager, 3rd Party M&E Consortium (Ten Billion Tree Tsunami Program) and Manager, Biodiversity Management Plan implementation (720 MW Karot HPP)	Specific interest in the national parks, bird and fish species (contacted 7th July 2023); Receipt of MKKS management plan on 14th July 2023; Based experience with the MKKS and BMP implementation, the IUCN MKKS team were identified as potential BAP partners for the Project
Mr. Akhtar Cheema Mahmood	IUCN	Country Representative, IUCN Pakistan	Specific interest in the national parks, bird and fish species
Mr. Ashraf Komal	IUCN		Specific interest in the national parks
Muhammad Jamshed Iqbal Chaudry	WWF Pakistan, Department of Conservation	Senior Manager Research & Conservation	Specific interest in bird and fish species
Rizwana Imtiaz Khan	Wildlife Department	District Wildlife Officer	Specific interest in the national parks
Saeed Tabassum	Forest, Wildlife & Fisheries Department	Chief Conservator of Forests Planning, Monitoring & Evaluation Punjab	Specific interest in the Gianthal Forest Reserve (contacted 7th July 2023)
Malik Sanaullah Khan	Forest, Wildlife & Fisheries Department	Director General Wildlife & Parks	Specific interest in the national parks (contacted 11th July 2023)
Saqib Mehmood	Forest, Wildlife & Fisheries Department	Chief Conservator of Forests, Northern Zone Rawalpindi	Specific interest in the Kala Chitta National Park (contacted 7th July 2023)
Khalid Mahmood	Forest, Wildlife & Fisheries Department	Chief Conservator of Forests Extension and Research, Punjab	Specific interest in Kohatti Forest Reserve (contacted 7th July 2023)
James Raymond	Earth Active	Senior ESG Consultant	Senior biodiversity specialist for BAP development
Michael Mere	Earth Active	ESG Consultant	Biodiversity specialist for BAP development
Tom McArthur	Sylvan Biodiversity	Director	Principal Biodiversity Specialist for BAP development
Francesco Ricciardi	ADB, Office of Safeguards and Environment Thematic Group	Senior Environment Specialist	ADB authority on BAP development

Aziz Karim	ADB	Environmental Specialist	ADB Technical Assistance consultant
Takhmina I. Mukhamedova	ADB	Energy Specialist	ADB authority on BAP development
Syed Asim Ali Sabzwari	ADB	Environmental Specialist; Office of the Safeguards	ADB authority on BAP development
Ehtesham Z. Khattak	ADB	Senior Project Officer (Energy)	ADB authority on BAP development

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8.2 Appendix 2 – Murree Kahuta Kotli Sattian Biodiversity Management Plan

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KAROT POWER COMPANY (PVT.) LTD

IUCN

Management Plan for Conservation and Management of Natural resources in

Murree Kahuta Kotli Sattian Forest Landscape

including National Park Area

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IUCN

Management Plan for Conservation and Management of Natural resources in

Murree Kahuta Kotli Sattian Forest Landscape

including National Park Area

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FOREWORD

Management plan is an essential tool to safeguard protected areas while allowing the sustainable use and enjoyment of the resources they contain. This is particularly important today, when the country faces the formidable challenges posed by climate change which threaten human life and well-being as well as the health and, in some cases the very existence, of our natural environment.

With that in mind, I am pleased to present this management plan for the Murree Kahuta Kotli Sattian National Park. This plan draws on current best practices and marks a departure from the manner in which such plans have been developed in the past.

In Pakistan, management plans have typically been prepared by consultants who conduct research, interpret the findings and develop a document based on their professional experience, often without visiting the site. But as we move into increasingly complex planning environments, with greater pressure on natural resources within protected areas, it is no longer viable to continue in this way. Critical to management planning for protected areas is consultation with the widest possible range of stakeholders, leading to the development of objectives that can be agreed upon and adhered to by all those who have an interest in the protection, conservation, restoration and sustainable use of the area's biological resources. For this reason, the process of developing this management plan included detailed consultations not only with subject experts and institutional stakeholders but also, importantly, with area residents and local communities.

The preparation of management plans of this sort can be expensive and time consuming. While shortcuts can be taken, this will only be the detriment of the protected area. Nevertheless, within a relatively short period of time, IUCN Pakistan has been able to develop a comprehensive management plan for the Murree Kahuta Kotli Sattian National Park and we are proud of this achievement.

It should be noted that this management plan is a living document and will need to be reviewed periodically, and amended or updated as necessary, so that its recommended measures remain relevant and are able to take into consideration the changing situation on the ground.

It is our hope that this management plan for the Murree Kahuta Kotli Sattian National Park will strengthen and support the conservation and sustainable management of this protected area of outstanding natural beauty, and that its biodiversity will be protected for present and future generations.

Secretary
Forests, Wildlife and Fisheries
Government of Punjab

ACKNOWLEDGEMENTS

IUCN Pakistan highly acknowledges the Karot Power Company Limited for the financial support provided for developing this management plan.

The Secretary Forests, Wildlife and Fisheries, Government of Punjab, provided unconditional support during management planning which is highly appreciated. The Director General Wildlife, Government of Punjab and senior officials of his department provided continuous technical oversight during the entire period for developing this management plan, which is duly acknowledged. Timely feedback and participation of the Additional Secretary Forests, Wildlife and Fisheries (Technical) in consultations carried out for development of this plan was instrumental and highly acknowledged. The Director General, Fisheries, Government of Punjab and senior officials of his department made valuable contributions towards finalization of the plan, which are duly acknowledged. The Conservator, Forests Rawalpindi (North) and his team regularly participated in all consultations carried out for finalization of this plan and provided valuable inputs towards its refinement, which is highly appreciated. The field assessments, project execution and planning processes for developing this plan was fully facilitated by the administration of Rawalpindi district especially the Assistant Commissioner, Kahuta, Govt. of Punjab, which is duly acknowledged. The field staff of the Punjab Forests, Wildlife and Fisheries Departments are also owed our deepest thanks for their help and support during data collection.

Last but not the least, I also acknowledge the efforts of IUCN experts, Mr. Peter Tarr, Dr. Javed Chaudhry, Dr. ZB Mirza, Dr. Aleem Chaudhry, Mr. Umeed Khalid, Dr. Muhammad Ayub, Ms. Firuza Pastakia and the IUCN, BMP Karot Hydropower project team involved in implementation. I would also like to thank Mr. Azhar Saeed of the IUCN Communication Unit who helped in the formatting and design of the final draft.

Mahmood Akhtar Cheema
Country Representative, IUCN Pakistan

ACRONYMS AND ABBREVIATIONS

AJK	Azad Jammu and Kashmir
BPS	basic pay scales
EPA	Environment Protection Agency
ESIA	environmental and social impact assessment
FAO	Food and Agricultural Organization of the United Nations
GDP	gross domestic product
GOP	Government of Pakistan
GPS	global positioning system
IEA	International Environmental Agreement
IUCN	International Union for Conservation of Nature
KP	Khyber Pakhtunkhwa
LPG	liquefied petroleum gas
MEA	multilateral environmental agreement
MKKS	Murree Kahuta Kotli Sattian
MOCC	Ministry of Climate Change
MW	megawatt
NGO	non-governmental organisation
PES	Pakistan Engineering Services
PKR	Pakistan rupee
SDG	Sustainable Development Goal
SDSN	Sustainable Development Solutions Network
TOR	terms of reference
UNEP	United Nations Environment Programme
UNWTO	United Nations World Tourism Organization
WWF	World Wild Fund for Nature

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PART I: INTRODUCTION

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1. About the Management Plan

The development of this management plan was prompted by the recent completion of the 720 MW Karot Hydropower Project. Situated on the Jhelum River near the village of Karot in Punjab, the project is located some 1.7 km upstream of the Karot Bridge and 74 km upstream of the Mangla Dam. The project site, which lies partly in Punjab and partly in Azad Jammu and Kashmir (AJK), is accessible through the Islamabad–Kahuta–Kotli road, approximately 29 km from Kahuta and 65 km from Islamabad. Work on the project began in 2016 and the power plant came online in 2021.

The environmental and social impact assessment (ESIA) conducted for the project calls for the development of a biodiversity management plan for the project area. The Pakistan Country Office of the International Union for Conservation of Nature (IUCN) is the implementing organisation for the development of the biodiversity management plan. One of IUCN's key deliverables is the development of two separate national park management plans, one for Azad Pattan National Park in AJK and one for the Murree Kahuta Kotli Sattian (MKKS) National Park in Punjab.

This management plan for the MKKS National Park was developed through a process of extensive consultations with stakeholders, field surveys and interviews, expert input, and a review of the relevant literature.

1.1 AUTHORITY OF THE MANAGEMENT PLAN

This plan sets out the vision and objectives for the management of the MKKS National Park. The management plan and its accompanying regulations, to be drafted in the near future, are the key operational documents governing activities in the park. All parties involved with the park in any capacity must ensure that all actions and decisions related to the park are in strict accordance with this document and the regulations. This includes park management and staff, officials of federal ministries, representatives of provincial departments and semi-autonomous bodies, as well as private sector companies. It also includes all contractors, partners, area residents, tourists and any other entities or individuals dealing in any way with the park.

All management, staff and stakeholders should be familiar with the contents of the plan and regulations, as well as the vision, objectives and policies of the park. It is part of every staff member's job and stakeholder's responsibility to support the implementation of this plan and assist in the enforcement of the regulations.

Primary responsibility for the implementation of the management plan and the enforcement of regulations lie with senior staff appointed to run the park (park managers) and support staff (park rangers, watchers, etc.). It is they who must ensure that the plan is operationalised on the ground and that the regulations are enforced. By virtue of their position on the frontlines, they are of course responsible for day-to-day management but their role extends to ensuring responsive and proactive rolling planning, as well as contributing to longer term strategic planning.

This first iteration of the management plan covers a ten-year period from 2022 to 2032. The plan will be comprehensively reviewed after the first five years, and updated and revised as necessary. Approved changes will be appended to master copies of the management plan, four of which are to be held at the Punjab Wildlife and Parks Department.

As implementation gets underway, all staff members and stakeholders are expected to propose improvements to the plan, as well as to procedures and mechanisms. Park management is a team effort that cuts across all sectors. The future of the park depends on all staff and stakeholders working together.

1.2 KEY MANAGEMENT PRIORITIES

Key management priorities for the MKKS National Park include the following:

- **Wildlife protection**
  - Increasing population numbers of key wildlife species
  - Combatting illegal hunting
  - Addressing human-wildlife conflict
  - Collecting data (wildlife monitoring surveys, species distribution modelling, etc.)

- **Conservation of habitat**
  - Restoring and improving key habitats
  - Creating wildlife corridors for connectivity between nearby protected areas

- **Institutional strengthening**
  - Setting up offices and recruiting staff
  - Training staff

- **Sustainable financing**
  - o Identifying tourism potential and promoting sustainable tourism
  - o Establishing management funds
  - o Engaging with conservation organisations and donor agencies

- **Cross cutting**
  - o Developing park regulations
  - o Building partnerships with local communities
  - o Improving public awareness about the importance of biodiversity.

This management plan sets out in broad terms the steps that will be required to ensure that these priorities are acted upon. Some measures, such as those for institutional strengthening, can and must be implemented immediately as management activities cannot begin without adequate and properly trained staff.

While certain measures for wildlife protection and the conservation of critical habitats can also be implemented immediately, rules and procedures will need to be spelled out in the park regulations which are to be drafted in the near future.

Ensuring sustainable financing will take time to implement. This is in part because resource generation activities such as tourism require the development of facilities and infrastructure to attract more visitors. Building partnerships and exploring options for donor support are also activities that require time to build momentum.

1.3 APPROACH AND NEXT STEPS

This management plan focuses on priority actions and administrative mechanisms required for effective park management. Many of the actions and mechanisms proposed will need to be planned and implemented after budget allocations are made. While the management plan sets out the main steps that need to be taken, these will be operationalised once park management bodies are in place and in consultation with stakeholders.

The plan is intended to be used in conjunction with park regulations, to be drafted in the near future, as well as all relevant national and provincial laws. Some laws may need to be amended to strengthen protections and it will be the responsibility of park management bodies to lobby their respective legislators for this purpose.

This plan was developed in a participatory manner, involving orientation workshops for stakeholders, data collection through consultation sessions, field surveys and literature review.[1] This will continue to be the approach as the plan moves into implementation, and throughout the cycle of review and revision.

Following the publication of this management plan, next steps include:

- Drafting of regulations by the end of 2023. These will be distributed for comment and field tested for three years (2024-2026) before being finalised.
- Dissemination of the management plan as a public document. It will be made widely available to all relevant stakeholders, partners and interested parties.
- Comprehensive review of the plan in 2026, with amendments to be implementation in 2027.

1. A list of stakeholder meetings and consultations is provided in Annex 1.

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2. Background and Context

Pakistan spans three of the world's eight biogeographic realms or ecozones (Indomalayan, Palearctic, Afrotropical), each with their distinct biota. It is also home to four of Earth's ten major biomes (desert, temperate grassland, tropical seasonal forest, mountain). Roughly two thirds of the country is mountainous, with variations in altitude giving rise to many diverse species and habitats often within short distances of each other (Baig and Al-Subaiee 2009).

There are 12 major vegetative zones across the country, ranging from the coastal mangrove forests of the Arabian Sea to some of the highest mountains in the world where the western Himalayas, Hindukush and Karakoram ranges meet. A great variety of terrestrial ecosystems can be found, from permanent snowfields and cold deserts in the north to the arid subtropical zones of Balochistan and Sindh in the south, from the dry temperate coniferous forests of the inner Himalayas to the tropical deciduous forests of the Himalayan foothills, from the steppe forests of the Suleiman Range to the thorn forests of the Indus plains, and from the swamps and riverine zones of the Indus and its tributaries to the mangrove forests of the Indus delta and Arabian Sea coast (Baig and Al-Subaiee 2009). This wide variety of ecological regions is a result of the country's unique location, with significant latitudinal and altitudinal variations.

Pakistan can be divided into nine main agro-ecological zones. About 80% of the country is arid or semi-arid, 12% is sub-humid and 8% humid, with two distinct seasons (summer and winter). In addition, a number of distinct agro-ecosystems have been created through the conversion of natural habitats to agricultural use. Around 500 wild relatives of cultivated crops have been reported and most of these are found in the northern areas (Baig and Al-Subaiee 2009).

The major portion of annual rainfall across most of the country occurs during the monsoon season, with limited winter rains. Because of this uneven distribution, precipitation is generally insufficient for rain-fed agriculture.

2.1 THREATS TO BIODIVERSITY

Natural habitats and biodiversity across the country are under increasing pressure from a variety of factors. These include industrial growth, infrastructure development and agricultural expansion, all of which have a detrimental effect on ecosystems. Climate change exacerbates the threat, making the need for conservation efforts all the more urgent.

Apart from habitat destruction as a result of development, the main threats to terrestrial biodiversity come from the unsustainable and unregulated use of natural resources. This includes livestock grazing and firewood collection, activities essential for the livelihoods of many natural resource dependent communities.

Livestock rearing is the cornerstone of the country's agricultural economy, contributing about 14% to the national GDP, with livestock numbers increasing by around 3% each year (GOP 2022). Although fodder cultivation is common in irrigated areas, persistent overgrazing continues to take place, degrading rangelands to as little as 15% of potential forage production (GOP and IUCN 1992). Similarly, 90% of non-alpine rangelands have been degraded. Rangeland degradation greatly reduces the diversity of flora and changes the vegetation composition (GOP 1999). Overall, it is estimated that Pakistan's woody biomass is declining at a rate of 4.6% per year (GOP 1992, Hosier 1993).

Another serious threat to biodiversity comes from unregulated hunting. Many bird and animal species face extreme population declines because of illegal hunting for sport, meat and trade. There is a long tradition of hunting in Pakistan but the impact has increased in recent decades with greater mobility and the widespread use of modern weapons. Virtually all large mammals have declined in number and in distribution. Currently, some 37 species and 14 subspecies of mammals, 25 species of birds, and 10 species of reptiles are designated as threatened (IUCN 2022b).

Aquatic ecosystems are also under increasing pressure and for many of the same reasons. Inland waters are polluted by industrial and municipal waste, while freshwater habitats have been degraded and fragmented, partly as a result of water diversion. The blockage of the Indus River through the construction of dams and barrages is considered to be the most important human caused threat to the country's aquatic ecosystems (Ahmad 1997).

Coastal and marine ecosystems are threatened by pollution, unsustainable resource extraction and the impacts of climate change. Industrial and municipal waste, as well as agricultural runoff,

flow down inland waterways and end up in coastal waters (Baig and Al-Subaiee 2009). Sea level rise causes waterlogging and increases salinity, further degrading coastal ecosystems. Overfishing is a serious threat, with large commercial operations using trawlers that capture huge quantities of fish including non-target species, and the netting of juvenile fish for use as poultry feed. The effects of upstream agricultural expansion and dam construction extend to the coastal areas, starving coastal and marine delta ecosystems of much needed freshwater replenishment (Baig and Al-Subaiee 2009). Meanwhile mangrove forests along the coastal belt are being destroyed owing to a combination of factors including coastal development, pollution, logging and aquaculture (UNEP 2021). Sedimentation, coastal erosion, a significant reduction in the freshwater supply, and increased marine water pollution from industries add to the problem (Mukhtar and Hannan 2012). As a result, more than 67% of mangroves have been lost or degraded over the last 20 years (UNEP 2021). Species affected include shrimp and fish, for whom mangroves serve as a breeding ground, as well as migratory birds that use mangroves as sanctuaries.

2.2 CONSERVATION AND PROTECTION

2.2.1 LEGAL AND POLICY FRAMEWORK

Pakistan has a robust legal and policy framework to support the conservation of biodiversity and the protection of natural resources, starting with comprehensive environmental protection laws enacted in the 1990s, backed by implementing rules and regulations.[2] Pakistan has also developed a number of policies to guide conservation, with a dedicated framework for biodiversity protection, the National Conservation Strategy, which was formulated in 1992.[3] This was followed by the preparation of a comprehensive Biodiversity Action Plan in 2000. The National Environment Policy was adopted soon thereafter, in 2005, to provide an overarching framework for addressing environmental concerns. An updated National Biodiversity Strategy and Action Plan was released in 2017.

In addition, Pakistan has developed a number of policies to address the challenges posed by climate change and to guide climate action, with its first dedicated Climate Change Policy approved in 2012, which was substantively revised and updated in 2021. This policy aims to ensure that climate concerns are mainstreamed in all economic and social sectors, and to steer the country towards climate resilient and climate responsive development. One of its major objectives is the conservation of natural resources for long term sustainability, to be attained through concrete measures encompassing forestry, biodiversity and vulnerable ecosystems.

A comprehensive National Forest Policy was launched in 2015 and approved by the Council of Common Interests in 2017. It focuses on the expansion of forests, natural habitats and green areas for restoration of ecological functions to maximise economic benefits. But forestry is a provincial subject and the provinces have yet to build a consensus on its recommendations (see section 2.2.2 below).

Pakistan is also a signatory to all major international treaties and conventions related to climate, wildlife and environmental pollution.[4]

2.2.2 DEVOLUTION OF POWERS

Until 2010, matters related to biodiversity and environmental protection were under the joint jurisdiction of the federal and provincial governments. In practice, the federal government developed broad policy frameworks and legislation on environmental matters, while the provinces enacted laws for specific subjects such as wildlife, forestry and fisheries. Under the 18th Amendment to the Constitution, which came into force in 2010, responsibility for “environmental pollution and ecology” was devolved to the provinces. Following the amendment, all matters

2. For an analysis of federal, provincial and regional biodiversity protection laws, see IUCNP 2003, 2004, 2007a, 2007b, 2008.
3. For a list of policies, see Annex 2.
4. See list at MOCC 2022. For ratification dates and current status, see International Environmental Agreements (IEA) Database Project 2022.

related to biodiversity and conservation are under the sole jurisdiction of the provinces or territories concerned. The role of the federal Ministry of Climate Change (formerly the Ministry of Environment) is to liaise with the relevant organisations and entities for the implementation of international treaties and conventions, to coordinate with provincial departments, and to formulate policy.[5]

Wildlife management and conservation in Pakistan is governed by provincial and regional laws, with each province or territory operating under its own legislation. The main laws in force in Punjab are as follows:[6]

- Punjab Protected Areas Act 2020
- Punjab Forest (Amendment) Act 2016
- Punjab Wildlife (Protection, Preservation, Conservation and Management) (Amendment) Act 2007
- Punjab Fisheries Ordinance 1961 (as amended).

Each province and territory have its own departments and institutional structures for the management and conservation of forests, wildlife and fisheries.

2.3 PROTECTED AREAS

The designation of protected areas is a critically important tool for biodiversity conservation, particularly in countries like Pakistan where entire ecosystems and natural habitats are under intense pressure from a variety of threats.

Pakistan has close to 400 protected areas designated by law. These include 31 national parks, 92 wildlife sanctuaries, 97 game reserves, 19 wetland reserves and 160 community reserves (IUCN 2020). Each type of protected area is set aside for a different purpose, and the rules that apply to their enjoyment and use are different.

In 2020 the government launched the Protected Areas Initiative, an ambitious nationwide programme which aims to increase the coverage of protected areas while creating green jobs in the process. The government earmarked PKR 4 billion for this initiative, 92% of which is said to be reserved for nature jobs and to improve the livelihoods of communities living within these areas. The initiative has three main objectives:

- Expand protected areas coverage to at least 15% of Pakistan's area by 2023 (from 12% in 2018).
- Effectively protect areas that have already been designated, with proper management plans and legislative interventions as well as standardised eco-friendly infrastructure design.
- Link this initiative to global efforts by getting at least seven national parks registered under the IUCN Green List of Protected and Conserved Areas, recognised as the gold standard for national parks management (IUCN 2022a).

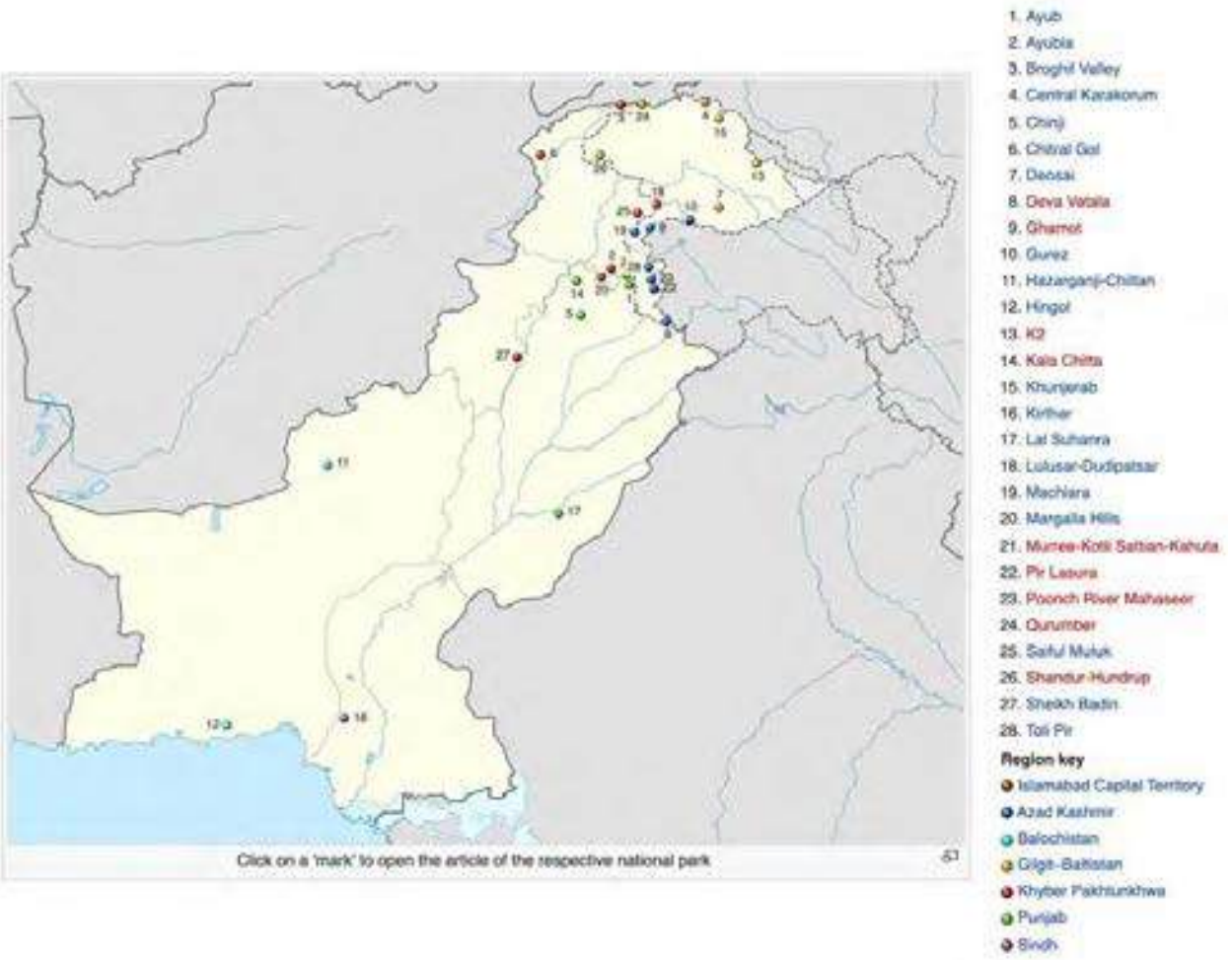
The initiative was launched with the announcement of 15 national parks, covering an area of over 7,300 km2 (730,000 ha). Nine of these are new and recently declared national parks while six were notified earlier but not properly managed. Under the initiative, these protected areas will be made fully functional with management plans, community-led governance and the allocation of conservation funds. This effort will be supported by the launch of Pakistan's first National Parks Service, responsible for the protection and conservation of these areas. Pakistan's national parks are shown in Figure 1.

2.4 OBJECTIVES OF A NATIONAL PARK

Broadly speaking, a national park is an area designated by the government for the preservation of the natural environment. The area may be set aside for public recreation and enjoyment or for its historical or scientific interest while keeping most landscapes and their accompanying plants and animals in their natural state. Although different countries designate their national parks differently, the purpose is to

5. For a detailed analysis of the 18th Amendment and its impact on environmental and natural resources legislation, see Pastakia 2014.
6. Other laws governing natural resources are also in force in AJK (see list at Government of AJK 2022).

Figure 1: Pakistan's national parks



conserve nature for posterity and as a symbol of national pride.

2.4.1 IUCN DEFINITION

IUCN defines a protected area as follows:

> A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values (Dudley 2008).

IUCN has developed a typology to cover various categories of protected areas and governance arrangements. According to this typology, national parks are defined as follows:

> Large natural or near-natural areas protecting large-scale ecological processes with characteristic species and ecosystems, which also have environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities (Dudley 2008).

2.4.2 DEFINITIONS UNDER PUNJAB LAW

As noted in section 2.2.2. above, matters related to wildlife management and biodiversity conservation are the responsibility of provincial and regional governments. Each province and territory have its own laws defining protected area categories and setting out rules for their management. Punjab has enacted various laws governing wildlife, forests and fisheries (see Government of Punjab n.d.). For the purposes of this management plan, the two laws that are most relevant are the Punjab Protected Areas Act 2020 and the Punjab Wildlife (Protection, Preservation, Conservation and Management) (Amendment) Act 2007.

The Punjab Wildlife Act is the principal law governing wildlife protection in the province. The definitions of protected area categories in this act were repealed and replaced by the Punjab Protected Areas Act 2020. The remainder of the wildlife law remains in force.

Under the Punjab Protected Areas Act 2020, the government may declare any government owned land to be a national park (Section 7(1)) for the following purpose:

The purpose of notifying a national park may be to protect an area of national or international biodiversity importance, or which contains viable samples of natural systems and scenic areas, or which is required to be protected due to the ecological integrity of one or more ecosystems (Section 7(3)).

A national park is accessible to the public for recreation, education and research subject to certain restrictions (Section 7(4)). Various activities are prohibited in a national park including hunting, logging and polluting the water (Section 7(6)).

Fisheries in the province are governed by the Punjab Fisheries Ordinance 1961, as amended up to 2001. Forest resources are managed under the Punjab Forest Act 1927, as amended up to 2016.

2.4.3 MANAGEMENT PLANS

National parks are intended to be preserved in perpetuity for their intrinsic worth and for the benefit, use and enjoyment of the public. Management plans are designed to achieve this goal, providing management objectives and setting out mechanisms and procedures for park protection. They are the primary document used in making management decisions for national parks. They have five main uses:

- Management and protection of flora and fauna, and natural and cultural features of the park
- Information source for commitments related to park management
- Direction for park managers
- Direction for decision makers considering proposals from businesses and others who require authorisation to undertake activities within the park
- Monitoring performance.

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3. Description of the Park Area

The MKKS National Park is located near Rawalpindi, Punjab. It was notified in September 2009 and covers an area of 5,7581 ha. This section presents an overview of the main features of the park and surrounding area, along with a brief description of key species found in and around the park.

3.1 GEOGRAPHY

3.1.1 LOCATION

The park lies at 33° 21′ to 34° 01′ N latitude and 73° 11′ to 73° 38′ E longitude in the district of Rawalpindi, in Punjab province (see Figure 2). It is located on the lateral spur of the sub-Himalayan mountains, bounded by the Jhelum River in the east, the Islamabad Capital Territory in the west, Khyber Pakhtunkhwa province in the north and Gujar Khan in Rawalpindi district in the south. The average elevation varies from 261 m to 2,261 m (Ahmed 2019).

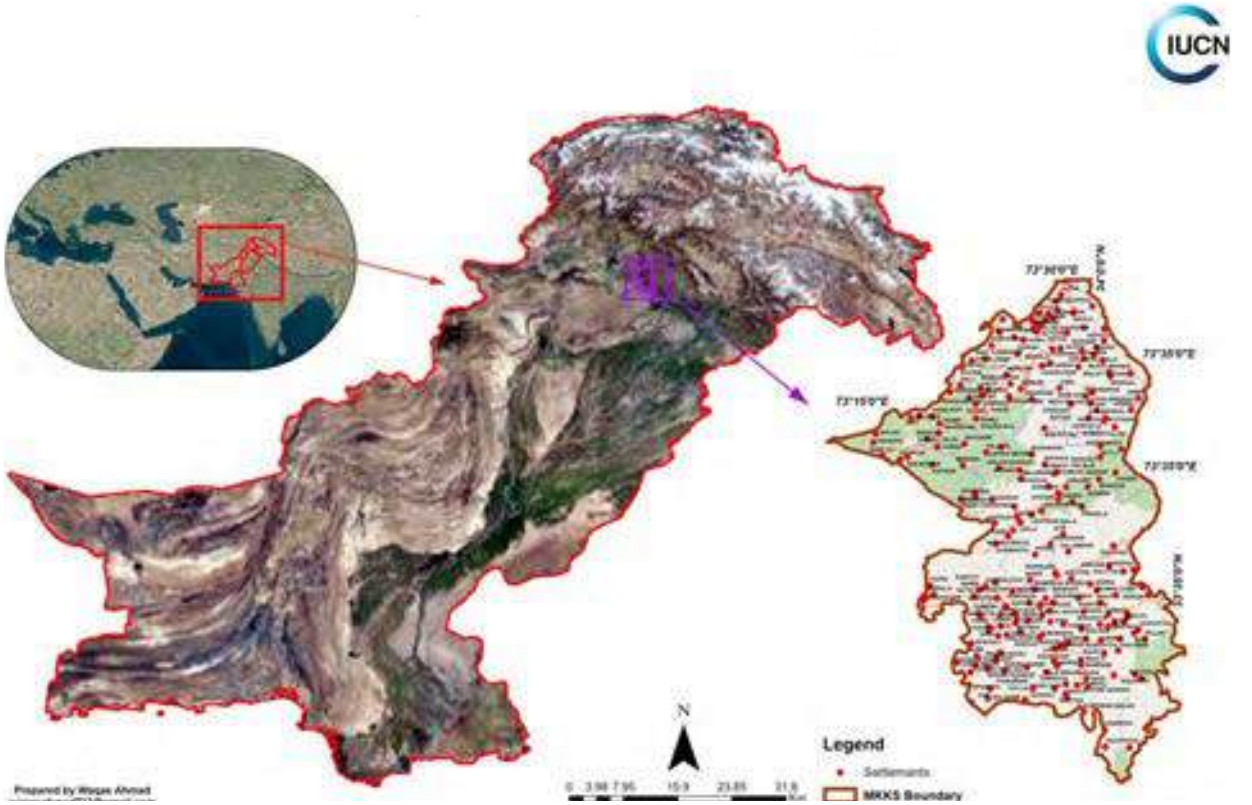
The park takes its name from the towns of Murree, Kotli Sattian and Kahuta which are the three main localities around the park area. The park can be divided into three zones, roughly corresponding to these areas. It is served by three main roads, the Murree Expressway, the Rawalpindi–Kahuta–Kotli road and the Rawalpindi–Azad Pattan road.

3.1.2 TOPOGRAPHY

The topography at higher altitudes is mainly rugged terrain with narrow valleys, while at lower elevations the land is relatively flat. The hilly areas are dotted with valleys created by fast flowing streams and rivers. These erode the soil and carry minerals to downstream areas, resulting in alluvial deposits that make the land there more fertile and thus better for cultivation. The Soan River flows from the northwest to southwest, while the Jhelum River runs through the eastern part, separating the area from the Kashmir region in the east. Besides the larger rivers, there are many streams which cut the area into deep narrow gorges. These streams flow with great speed particularly in the monsoon season, resulting in seasonal floods which cause soil erosion.

The 2,500 km Himalayan Range was created during the Eocene epoch about 20 million years ago by the collision of the Indian plate with the Eurasian plate along a suture zone, creating rapid uplifting of the landmass and producing complex geological stratifications (Abbasi et al. 2002; Khan et al. 2011; Sheikh et al. 2008). The area is regarded as geologically immature and made up of Miocene sandstone and Eocene Nummulitic limestone. Lithologically, the area consists of limestone, hard grey to reddish clay stone and white sandstone interbedded with soft red calcareous shale and alluvial deposits belonging to the Sirmar and Sivalik series of the sub-Himalayan system (Khan et al. 2011; Saqib et al. 2014).

Figure 2: Map of the MKKS National Park



3.1.3 SOIL

The soils in the park are classified as Entisols (very poorly developed recent soils) and Inceptisols (soils in an early stage of formation) with non-calcareous forms at higher altitudes and calcareous forms at lower altitudes (Ellis et al. 1994; Ullah 2009). They are typically loamy and very shallow as their development has been restricted by the steepness of the slopes. The soils of the mountains are residual, derived from shale and sandstone, while the soils of the steep slope regions are colluvial with very low soil thickness (Saqib et al. 2014). In the valleys, soils are of an alluvial type.

3.2 CLIMATE

Weather in the area is known to change rapidly because of its proximity to the Himalayas and the Pir Panjal Range. The climate is sub-humid sub-tropical continental in the southern parts, changing to humid sub-tropical continental towards the northern parts. Winter temperatures can reach sub-zero but averages range between 1.6°C and 21°C. Summer temperatures can reach 40.2°C (Ali 1991).

The area experiences distinct seasons (spring, summer, autumn, winter) but there are vast variations within a small geographical area, owing to differences in altitude, topography, vegetation, and the amount and duration of winter snowfall. Generally, the climate is cooler at higher altitudes and warmer lower down.

The hydrological cycle of the area depends mostly on rainfall. There are two distinct rainy seasons. The summer rainy season or monsoon begins around mid-July and lasts until the end of September. Most precipitation occurs in July and August. Annual precipitation ranges from 750 mm to 1,250 mm. Rains are most frequent in August followed by July, September, March and February, and scarce during October at Murree and during November at Rawalpindi. Because of the steep slopes and general scarcity of grass cover, most of the rainwater drains quickly towards the Indus through the Soan River and its tributaries, the Korang and Leh nullahs. A small portion of the area drains into the Haro and Jhelum rivers. Land use in the MKKS area is shown in Figure 3.

Figure 3: Land use/land cover in the MKKS National Park

3.3 DEMOGRAPHICS

The park houses and is surrounded by at least 372 villages with a combined population of 573,058 in 2017 (see Figure 4). The average household size is 6.13. Communities in the area practise subsistence cultivation of cereal crops. Many of those living inside or close to the park extract non-timber forest products derived from species such as wild olive, chir pine and acacia for commercial markets.

3.4 ECOLOGY

Local variations in physiographic position, precipitation and temperature create conditions for markedly different vegetation complexes within the same general area. The hilly terrain mainly consists of gentle to moderately steep mountain slopes below the chir pine zone. There are two main ecosystems in the national park:

- Subtropical chir pine forest: Steep mountain stands (1,050 m to 1,800 m) are covered with this type of forest. Climatic conditions here support the growth of major species such as African boxwood (Myrsine africana), Indian barberry (Berberis lycium), chir pine (Pinus

roxburghii), Bluejack oak (Quercus incana), broadleaf hopbush (Dodonaea viscosa) and conkerberry or bush plum (Carissa spinarum).

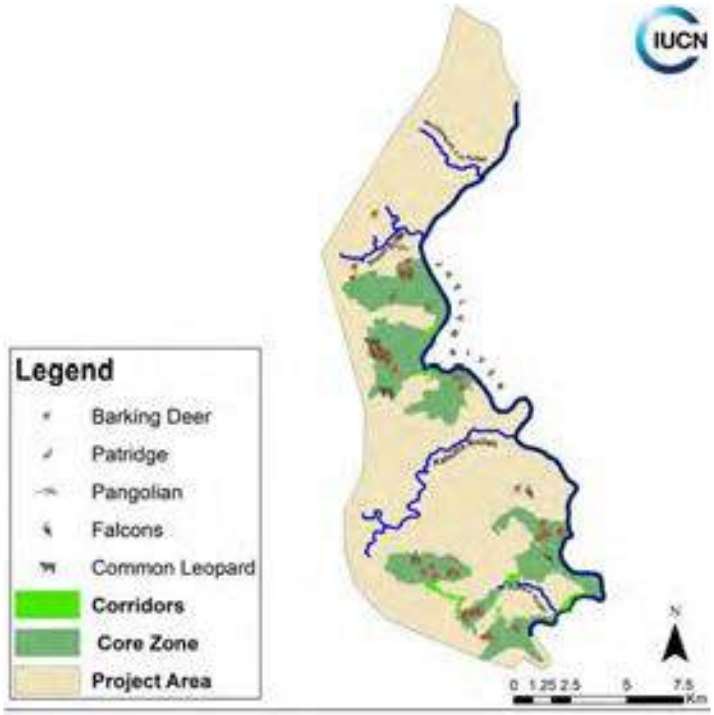
- Subtropical broadleaf forest: This forest occurs on gently sloping to moderately steep mountain slopes below 1,050 m. This area supports mixed open scrub vegetation comprising phulai (Acacia modesta), Indian olive (Olea ferruginea), halfa grass (Desmostachya bipinnata), wild sugarcane (Saccharum spontaneum), conkerberry or bush plum (Carissa spinarum), Indian laburnum (Cassia fistula), fire flame bush (Woodfordia fruticosa), Malabar nut (Adhatoda vasica), Bermuda grass (Cynodon dactylon) and broadleaf hopbush (Dodonaea viscosa) (Khan, 1994).

3.5 KEY SPECIES OF FAUNA

Important mammal species found in the park area include the common leopard (Panthera pardus), common otter (Lutra lutra), barking deer (Muntiacus vaginalis), jungle cat (Felis chaus),

Figure 4: Settlements in and around the MKKS National Park

Figure 5: Wildlife location in the MKKS area based on wildlife population surveys



rhesus macaque (Macaca mulatta), Himalayan palm civet (Paguma larvata), wild boar (Sus scrofa), yellow-throated marten (Martes flavigula), flying squirrel (Eoglaucomys fimbriatus), hill fox (Vulpes vulpes griffithii) and golden jackal (Canis aureus). The Indian pangolin (Manis crassicaudata) is also found in the park area.

Prominent bird species are the black francolin (Francolinus francolinus), red-vented bulbul (Pycnonotus cafer), black kite (Milvus migrans), white-crested kalij pheasant (Lophura leucomelanos), black-rumped flameback (Dinopium benghalense), grey francolin (Ortygornis pondicerianus), golden oriole (Oriolus oriolus), rufous treepie (Dendrocitta vagabunda), black-winged kite (Elanus caeruleus), carrion crow (Corvus corone) and house sparrow (Passer domesticus). Small numbers of chukar partridge (Alectoris chukar) and Indian peafowl (Pavo cristatus) are also reported to occur (Roberts 1991).

The wetlands of the park are home to a variety of aquatic fauna, notable among them the twin-banded loach (Botia rostrata), Alwan snow trout (Schizothorax richardsonii) and mahseer (Tor putitora).

Many of these species are threatened with extinction, mainly from the destruction of forests, illegal hunting and the fragmentation of habitats as a result of development.

During the surveys conducted for the preparation of this management plan, 47 species of birds, 17 mammals, 2 reptiles, 20 fish, 3 butterflies and 9 other insects and arthropods were recorded (see Annex 3). Figure 5 shows the location of wildlife species in the area.

3.6 RIPARIAN HABITATS

As noted earlier, a number of streams and rivers run through the area, notably the Soan River which flows from the northwest to the southwest and the Jhelum River which runs through the eastern region. Besides the larger rivers, there are many streams which flow with great speed particularly in the monsoon season, resulting in seasonal floods which cause soil erosion.

The Jhelum meets the Neelum River at Muzaffarabad, the administrative centre of AJK, and then bends southward, forming part of the border between AJK to the east and Khyber Pakhtunkhwa province to the west (UPSC with Nikhil 2022). The river then flows into Punjab to the south. The Jhelum breaks through the Outer Himalayas near Mangla, forming broad alluvial plains. It turns south-westward at Jhelum, following the Salt Range to Khushab, where it bends south again to join the Chenab River near Trimmu. The Jhelum is about 725 km long with a total catchment area of about 15,856 km2.

The Soan River is an important waterway in the northern Punjab region. It drains much of the water of the Potohar and provides water to the Simly Dam, the main reservoir for Islamabad. The Ling Nullah drains into the Soan near Sihala on the southern side of the villages of Bhandar and Gagri. Two other notable streams are the Korang and Lai nullahs.

There are numerous small lakes, ponds and waterfalls in the area, providing semi-cold and warm water habitats. The wetlands of the park are home to a variety of aquatic fauna, including more than 20 fish species, three of which are on the IUCN Red List. The twin-banded loach and Alwan snow trout are listed as vulnerable and the Mahseer as endangered.

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PART II: MANAGEMENT PLAN

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4. Vision and Objectives

The vision and objectives of this management plan were developed in consultation with stakeholders and in accordance with the relevant laws.

4.1 VISION

The vision for the management and protection of the MKKS National Park is set out as follows:

> The Murree Kahuta Kotli Sattian National Park is a conservation priority because of its habitats, wildlife and fisheries, and links with the surrounding landscapes. This park will be managed to improve ecological functioning and wildlife populations, and to provide a broad range of ecological services to the people residing therein and in the proximity, thereof.

4.2 OBJECTIVES

Management objectives for the MKKS National Park as follows:

- Objective 1: Conservation and safeguarding of the biodiversity of the MKKS forest landscape for scientific and economic purposes
- Objective 2: Development and promotion of community-based sustainable tourism
- Objective 3: Sustainable use of natural resources with equitable benefit sharing among all stakeholders.

The sections that follow set out proposed management interventions under each of these objectives.

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5. Conservation and Protection

Objective 1: Conservation and safeguarding of the biodiversity of the MKKS forest landscape for scientific and economic purposes

The MKKS forest landscape is rich in biodiversity and home to a great variety of birds, mammals and fish, many of which are on the IUCN Red List of Threatened Species. This section outlines measures required to protect biodiversity in and around the park area. These include broad and system-wide actions designed to protect habitats, as well as strategies to address specific threats.

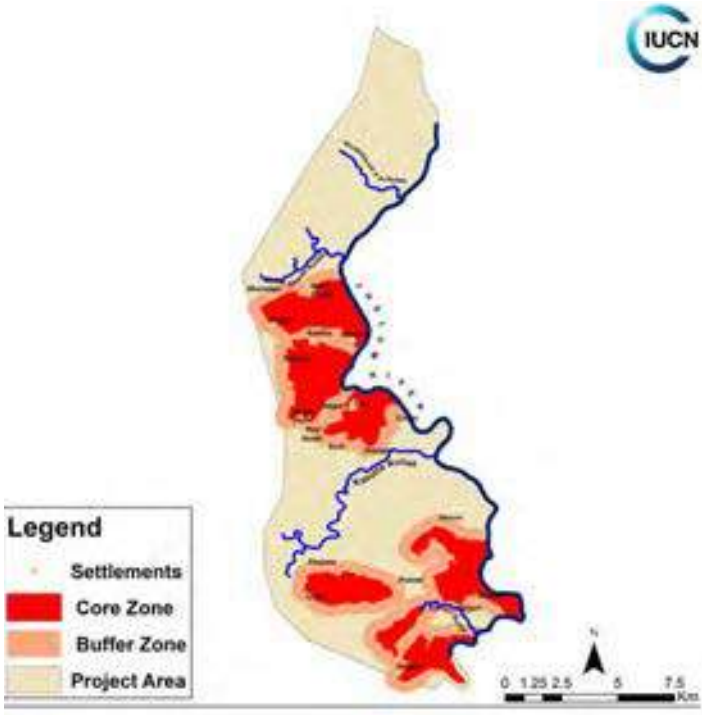
5.1 PROTECTION OF CRITICAL HABITAT

On the basis of wildlife population assessment surveys carried out by IUCN teams, seven areas within the MKKS National Park have been mapped as wildlife hotspots and designated as the core zone. These are relatively well forested areas carrying wildlife populations and are considered to be critical habitats (see Box 1).

The core zone has been designated to address the impacts on biodiversity directly associated with the Karot Project. Defined on the basis of an assumed impact zone along a 36 km stretch of the Jhelum River, it extends 24 km upstream of the dam and about 12 km downstream of the dam to the maximum inundation level of the Mangla Reservoir. Tributaries draining into this segment of the river that have significant potential for breeding of fish are included in the core zone.

Around the core zone, a buffer zone of 500 m has been designated, which contains small hamlets. This includes areas where the Karot Project may have a lower direct impact, but which are of regional ecological relevance and are important to ensure no net loss of biodiversity (see Figure 6).

Figure 6: Core and buffer zones in the MKKS area



Three areas within the core zone will be selected for a pilot initiative involving wildlife population assessment surveys to set a baseline and determine targets for protection goals. Subsequently, surveys will be conducted annually to monitor wildlife populations.

Protecting critical habitat requires a multi-pronged strategy involving multiple activities and diverse stakeholders. Key strategic actions include the following:

- Restore degraded or fragmented habitats through afforestation, reforestation and assisted natural regeneration (managed regrowth).
- Prevent further habitat destruction through strict enforcement of wildlife laws, infrastructure development laws and planning regulations; control of resource extraction from the park area; and control of forest fires.
- Monitor the status of key species through periodic wildlife surveys.
- More effectively monitor and protect wildlife by training existing staff and hiring additional staff.
- Establish and institutionalise community-based monitoring to assess trends in wildlife populations and to support recovery of vulnerable species.
- Strengthen community-based management of natural resources through capacity building, equitable benefit sharing and other measures.

Box 1: Critical habitat

Habitat loss and degradation, especially of forested areas, is a major threat to all wildlife species. Establishing and maintaining protected areas that include habitats in which comparatively large populations of threatened species persist can help ensure their long-term survival.

Critical habitats are areas with physical or biological features that are essential for the conservation of a particular species. They may lie within or outside the current range of the species. In other words, all areas deemed important to the survival or recovery of a species are categorised as critical habitat.

Once an area has been declared or assessed to be a critical habitat, it must be set aside or assigned special status. Any activities that adversely modify such an area must be prohibited.

Management actions: Protection of critical habitat

Preserve areas identified as critical habitat and restore degraded habitats to support wildlife populations and improve the overall health of the ecosystem

Action	Lead actor(s)	Timeline	Indicators of success
Strengthen 'general area' natural resources management, including measures to improve knowledge and information (e.g., game surveys, corridor mapping, information exchange, indigenous knowledge systems); lobby aviation and security authorities to make ground and aerial surveys easier to undertake, including by drones if necessary	Park authorities, forest department, wildlife department, with support from aviation and security agencies	Start in 2022, and then continuous	• Increased cooperation and knowledge exchange • Number of surveys and mapping exercises completed • Increase in forested area • Increase in wildlife numbers
Launch information and awareness campaigns (radio, pamphlets, signboards) to ensure that area residents and local communities are aware of the existence of the park and of the activities that are prohibited within its boundaries (e.g., hunting, logging, transport of game meat or timber originating from the park to local destinations or any other country)	Park authorities, with support from local media, community elders	Start in 2022, and then continuous	• Information materials developed and disseminated • Local residents aware of park boundaries and prohibitions (survey) • Decrease in incidents of illegal hunting and logging (survey)

Action	Lead actor(s)	Timeline	Timeline
Strictly enforce laws and regulations applicable to the park, arrest and prosecute all those involved in illegal hunting and logging	Park authorities, law enforcement agencies, with support from local communities	Start in 2022, and then continuous	• Number of arrests and successful prosecutions • Decrease in incidents of illegal hunting and logging (survey)
Establish ecological refuges (e.g., sections of a river where fishing is prohibited, forest areas where hunting is prohibited) to provide safe breeding areas for wildlife	Park authorities, with support from local communities	Start in 2023	• Refuges established • Resource use within refuges minimised or halted (survey)
Promote conservation agriculture, allowing local residents to improve livelihoods without expanding their land use footprint or employing destructive slash and burn practices	Park authorities, with support from agriculture department	Start in 2023 and then continuous	• Number of conservation agriculture pilot projects launched • Conservation agriculture becomes default agricultural practice (case studies)
Establish a nursery to propagate indigenous tree and plant species for reforestation and plantation in degraded areas	Park authorities, forest department	Start in 2024 (or as soon as budget is available)	• Nursery established • Number of saplings and plants propagated • Number of species planted in degraded areas • Area covered in new plantation
Mobilise local communities, including schoolchildren, to support and participate in habitat restoration	Park authorities, with support from local media, community elders, school heads	Start in 2024 (or as soon as budget is available)	• Number of community leaders engaged • Number of community members involved in restoration projects • Number of children participating in plantation activities
Engage with developers (e.g. road construction, infrastructure projects) to agree on ways to minimise habitat damage and fragmentation	Park authorities, Environmental Protection Agency (EPA)	Ongoing, as required	• Environmental impact assessments conducted and thoroughly vetted for all new infrastructure and development projects

5.2 CORRIDORS FOR WILDLIFE MOVEMENT

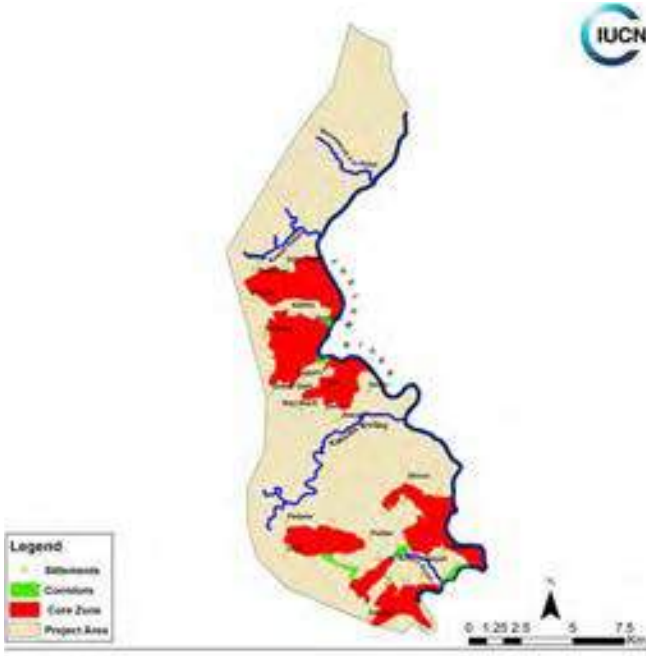
Wildlife corridors are critical for the maintenance of ecological processes. They provide landscape connections between habitats, enabling migration and interbreeding of plants and animals, and are thus crucial for the continuation of viable wildlife and plant populations (see Box 2).

Although animals do of course create their own paths between nesting or breeding sites, feeding grounds and watering holes, there are no officially designated wildlife corridors within the Azad Pattan National Park or between the park and surrounding areas. This means that any kind of human activity or intervention could potentially cut off access for wildlife to areas that are critical for their survival. It is therefore essential to designate corridors within the Azad Pattan National Park, where no human activity or intervention is allowed. Local communities should be informed about these corridors and their importance, and trained to monitor and protect them.

Under this management plan, in the first phase wildlife corridors between the ten wildlife hotspots within the core zone will be protected (see Figure 6). In these areas, no human activities or interventions will be permitted.

In the longer term, corridors between the Azad Pattan National Park and neighbouring conservation areas, namely the Janjal Hills Game Reserve, the Tolipeer National Park and the Poonch River Mahseer National Park, will be developed.

Figure 7: Wildlife corridors in the MKKS area



Box 2: Wildlife corridors

Designating wildlife corridors is a way to connect two or more wildlife habitats. Especially in areas where habitat loss and fragmentation are a key conservation concern, corridors can help mitigate some of the impact on wildlife populations.

A wildlife corridor can be used to connect habitats that are fragmented or wildlife populations that are separated by human activities or structures (e.g., roads, infrastructure, settlements). This allows the exchange of individuals between populations, helping to improve species health and increase genetic diversity. Corridors can also help to re-establish wildlife populations in areas where they have been wiped out or where numbers have decreased suddenly as a result of unforeseen events such as disease outbreaks, forest fires or natural disasters (Hilty et al. 2020). For large or wide-ranging species in particular, it is essential that protected areas situated within a matrix of human-dominated land uses are linked or connected with one another (Naidoo et al. 2018).

Corridors represent a key advance in the design of conservation landscapes, increasing the movement of species between habitats by up to 50%. For this reason, they are increasingly being incorporated into conservation planning and land use zoning around the world.

Management actions: Corridors for wildlife movement

Ensure that wildlife populations are able to move freely through secure corridors that are managed and protected by local communities

Action	Lead actor(s)	Timeline	Indicators of success
Identify, map and designate wildlife corridors and dispersal areas	Park authorities, in consultation with wildlife experts and local residents	By mid 2023	• Corridors identified and mapped (size/area, GPS coordinates) • Signboards and other markings in place
Hold stakeholder meetings to review corridor designation	Park authorities	By end 2023	• Stakeholder consultations conducted • Stakeholder feedback incorporated into designation actions
Prepare management plans for each corridor, including strategic measures and actions for their protection	Park authorities, in consultation with local communities, wildlife experts	By mid 2024	• Management plans developed and approved, including rules and guidelines • Information materials in local languages developed and disseminated
Protect and maintain designated corridors according to approved management plans	Park authorities, with support from local communities	By end 2024, and then ongoing	• Increased wildlife movement (survey) • Number of community members aware of rules (survey)
Remove security barriers and other impediments, redesign infrastructure in and around important corridors to allow free movement of wildlife	Park authorities, wildlife experts, with support from security agencies	Start in 2025	• Barriers removed or redesigned • Increased wildlife movement (survey)

5.3 CONSERVATION OF FISH HABITATS

The MKKS area is dotted with small lakes, ponds and waterfalls that are home to a variety of aquatic fauna. This includes more than 20 fish species, three of which are on the IUCN Red List. The twin-banded loach and Alwan snow trout are listed as vulnerable and the mahseer as endangered. Measures are required to protect all aquatic biodiversity, especially habitats of species facing extinction.

Infrastructure development and the construction of dams have fragmented or destroyed key habitats, spawning grounds and fish nurseries. The removal of sand and gravel from river beds for construction activities further damages these fragile ecosystems. The pollution of rivers and streams is also a serious issue (Government of KP n.d.; Dawn 2010).

Climate change poses another threat to fish habitats. The Jhelum River and its tributaries upstream of the Mangla Reservoir are important breeding grounds. In 2021-22, prolonged drought conditions in the area caused many tributaries and water pools to dry up, with a direct impact on the fish population.

Alien invasive species are a matter of concern as well. Although the freshwater streams in the MKKS area mostly contain indigenous fish species, some exotic species are also reported, including the tilapia (Oreochromis niloticus) and Chinese carp (Cyprinus carpio). These populations need to be closely monitored to ensure that their numbers do not pose a threat to indigenous species by overrunning their habitats and breeding grounds, particularly in the case of endangered and vulnerable fish species.

Management actions: Conservation of fish habitats

Protect and sustainably manage fisheries resources to improve fish stocks and support biodiversity conservation

Action	Lead actor(s)	Timeline	Indicators of success
Introduce a research and monitoring programme for fish species and their ecology, particularly vulnerable species (mahseer, trout, loach)	Fisheries department, with support from park authorities, research institutions	Start in 2022, and then continuous	• Population monitoring reports published regularly • Vulnerable species numbers increase
Lobby the relevant authorities to ensure that laws and regulations are amended to reflect the conservation status of vulnerable species (IUCN Red List)	Park authorities, conservation organisations and NGOs	Start in 2022	• Laws and regulations amended to reflect conservation status of vulnerable species
Develop a strategy for the conservation and protection of the critically endangered mahseer	Fisheries department, with support from park authorities, research institutions	By 2024	• Policy developed • Conservation measures implemented
Initiate steps to replenish fish stocks and promote sustainable fishing	Fisheries department, local communities, with support from park authorities, research institutions	By 2025	• Sustainable fishing policy developed • Fish breeding centre established

5.4 COMBATING ILLEGAL HUNTING AND FISHING

Over the last 30 years, poaching has decimated wildlife in the MKKS area. Organised hunting parties kill animals for meat, either for personal consumption or for the market. Some species are hunted as trophies, or for their skins or plumage. Others are killed and exported illegally to be used in traditional medicine. The widespread use of high-power weapons and ammunition allows greater numbers to be killed with ease. Increased mobility means that more outsiders are able to access the area.

Some species are protected by law though exceptions exist that allow many of these animals to be hunted with special permits. What protections do exist under the law are not properly implemented.

While poaching still occurs, ironically such incidents are now less common because wildlife numbers have declined. Poachers are mostly local residents but people from outside the area are also known to enter the park for this purpose. Apart from poor law enforcement, partly because there are no forest guards or wildlife rangers to patrol the area, factors that contribute to poaching include poverty as well as lack of awareness about conservation generally and about the importance of protecting vulnerable species in particular.

An additional problem is that park boundaries are not demarcated, in effect rendering the area open access. Government departments themselves disagree over park boundaries. There are also issues related to the demarcation and designation of forest areas. According to a government notification, only reserved forests may be declared to be part of a national park. While local forest department staff and area residents know the boundaries of the reserved forest, there is nevertheless lack of clarity about the exact boundaries of the MKKS National Park, which covers a wider area that includes other categories of forest.

A lesser concern is low-intensity hunting by local communities for their own consumption, but the practice should not be allowed to escalate. Area residents use old weapons, spears, bows and arrows, dogs, and traps. In theory, this type of traditional hunting should not pose a threat to wildlife populations as long as intensity is low, hunting is not commercialised and the target species occur in healthy numbers.

Illegal fishing. The area is under heavy pressure from illegal fishing, with an estimated 40 illegal fishing incidents recorded by the IUCNP team during a six-month period alone. Fish populations are also in decline because of unsustainable fishing practices (Dawn 2010). Fish are often caught by highly destructive methods, such as the use of dynamite, hand grenades and electric current to stun and capture fish. In addition, poisoning of streams and rivulets is often done to quickly kill entire shoals. Other harmful fishing practices include building temporary stone dams across streams and using fine mesh nets to capture juvenile specimens (Government of KP n.d.; Dawn 2010). There are some legal protections in place for fish species (see Box 3).

Excessive hunting and fishing, and the hunting and fishing of vulnerable species, represent the greatest single threat to wildlife in the MKKS area and must be controlled as a matter of urgency. A strategic approach will be taken, involving the following measures:

- Lobby for the amendment and updating of laws to reflect the current conservation status of vulnerable wildlife and fish species.
- Develop a practical, harmonised approach to the enforcement of laws and regulations by working closely with area communities, the police, watchdog groups and law enforcement agencies.
- Conduct regular security patrols and anti-poaching surveillance in partnership with area communities.
- Develop a system of rewards and incentives (financial or otherwise) for the reporting of illegal activities and publicise such schemes in the area.
- Ensure that park staff are adequately trained so that they operate within the relevant policies and laws, and are able to properly collect and preserve evidence to assist in the prosecution and conviction of offenders.

Box 3: Protection of fish species

It is worth noting that no fish species is fully protected under Punjab law. The Punjab Fisheries Ordinance 1961 only provides partial protection for six species, with restrictions on the time of year that fishing is permitted and the size of fish that can be taken (Section 8 and the First Schedule). The mahseer and trout are partially protected in this manner. There are no protections in place for the loach.

Management actions: Combating illegal hunting and fishing

Strengthen law enforcement to combat illegal hunting and fishing for improved biodiversity conservation and management, ensuring that local communities are involved in protection activities

Action	Lead actor(s)	Timeline	Indicators of success
Develop a register or database to record all incidents of illegal hunting and fishing so that these activities can be monitored and effective actions taken for prevention	Park authorities, with support from local communities	Start in 2022, and then continuous	• Register/database developed • Data included in park annual reporting documents • Records made publicly available
Strictly enforce laws and regulations related to hunting and fishing, arrest and prosecute all those involved in illegal activities	Park authorities, law enforcement agencies, with support from local communities	Start in 2022, and then continuous	• Number of arrests and successful prosecutions • Decrease in incidents of illegal hunting and fishing (survey)
Launch information and awareness campaigns (radio, pamphlets, signboards) to ensure that local residents and communities are aware of the rules that apply to hunting and fishing within the park and the activities that are illegal within its boundaries (e.g., hunting, transport of animals or meat originating from the park to local destinations or any other country)	Park authorities, with support from local media, community elders	Start in 2022, and then continuous	• Information materials developed and disseminated • Local residents aware of park boundaries and rules (survey)
Develop partnerships with local communities, including pilot co-management initiatives, for wildlife protection; ensure that communities receive tangible benefits from conservation activities	Park authorities, in partnership with local communities, with support from conservation organisations, NGOs	Start in 2022, and then continuous	• Number of partnership agreements in place • Number of pilot co-management initiatives launched

5.5 REDUCING HUMAN-WILDLIFE CONFLICT

The conflict between humans and wildlife has been identified as an important conservation issue in the wider MKKS area (PES 2015). Baseline data for the area in and around the park is limited but there is ample anecdotal evidence to suggest that this is a serious problem (see Box 4).

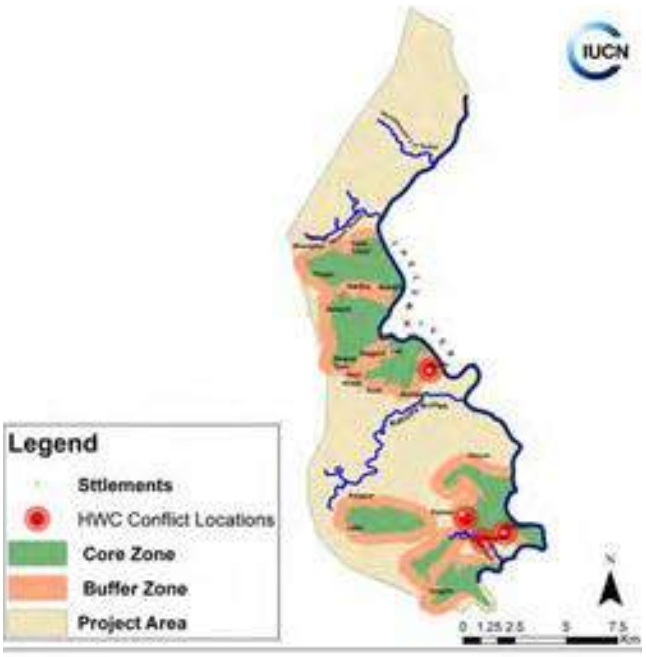
Species most at risk include the common leopard, Asiatic jackal or golden jackal, wild boar and Indian crested porcupine. The common leopard and the Asiatic jackal are known to prey on livestock, while the wild boar and Indian crested porcupine can cause crop damage. These species, especially the common leopard, have been widely persecuted by local communities.

The strategy to reduce human-wildlife conflict includes the following measures:

- Manage human-wildlife conflict at the local level, and collaboratively with park managers and communities.
- Within the parameters allowed by law, give greater decision making authority to local officials to manage 'problem' animals.
- Develop plans and operating protocols, in line with the law, and collaboratively with park managers and local communities.

Figure 8 shows a map of human-wildlife conflict locations according to the findings of a questionnaire based survey conducted in selected areas of the park.

Figure 8: Human-wildlife conflict locations



Box 4: Human-wildlife conflict

Human-wildlife conflict is becoming a global problem as natural habitats around the world are destroyed or degraded and humans increasingly encroach on wilderness areas.

Wild animals are killed in traffic and railway accidents, caught in snares set for other animals, or fall into farm wells. Many are shot, poisoned or captured in retaliation for attacks on humans and livestock or for causing damage to crops or property. Such incidents not only affect the viability of endangered species populations but also have a broader impact on ecosystems and biodiversity.

Human-wildlife conflict poses a threat to human health and safety as well. Nuisance encounters with small animals and physical injury or even death caused by large predator attacks have high costs for individuals and communities. The destruction of crops, damage to infrastructure and property, and the loss of livestock all put a financial burden on communities. In the case of attacks on humans, medical expenses and days lost from work or school are a concern, creating fear among communities and giving rise to resentment and retaliatory attacks on animals perceived to be a threat.

Exposure to zoonotic diseases is another danger, particularly in the wake of the Covid-19 pandemic, widely understood to have been the result of the virus jumping from animals to humans.

Such broad impacts require governments, wildlife managers, scientists and local communities to work together to develop measures that prevent death and suffering of people as well as wildlife.

Management actions: Reducing human-wildlife conflict

Minimise the adverse impact of human-wildlife conflict in partnership with local communities to reduce hardship to people and prevent the loss of vulnerable wildlife species

Action	Lead actor(s)	Timeline	Indicators of success
Provide financial compensation to area residents suffering losses as a result of animal encounters to address hardship, reduce resentment and prevent retaliatory attacks	Park authorities, with supported from conservation organisations, NGOs	Start in 2022, and then continuous	• System of compensation payments in place • Number of local residents receiving compensation
Educate area residents on humane methods to protect crops and livestock from predators	Park authorities, in partnership with community leaders	Start in 2022, and then continuous	• Reduction in incidents of human-wildlife conflict (survey) • Number of serious incidents avoided (case studies)
Establish community-based committees to manage human-wildlife conflict and liaise between park authorities and local residents	Park authorities, in partnership with community leaders	Start in 2022, and then continuous	• Committees established • Number of serious incidents avoided (case studies)
Conduct education campaigns (schools, mosques, community gatherings) to raise awareness about public safety and humane methods to address such incidents	Park authorities, in partnership with community leaders, supported by conservation organisations, NGOs	Start in 2023	• Number of awareness events held • Number of participants • Information materials developed and disseminated
Develop an action plan to mitigate human-wildlife conflict and ensure implementation in all affected areas	Park authorities, wildlife experts, in consultation with local communities	By 2023	• Action plan developed and implemented
Introduce group insurance schemes, with contributions from the government, to address financial hardship as a result of crop or livestock losses	Park authorities, supported by government, conservation organisations, NGOs	By 2023	• Group insurance scheme set up • Number of households covered • Number of households receiving insurance pay-out

Action	Lead actor(s)	Timeline	Indicators of success
Explore additional options to finance compensation schemes, such as the establishment of a fund, with a percentage of all revenues raised from park activities paid into the fund (e.g., franchise fees, tourism revenues, fishing licences)	Park authorities, supported by government, conservation organisations, NGOs	By 2024	• Fund established and adequately resourced

5.6 DEVELOPING A KNOWLEDGE BASE

Conservation actions cannot be properly targeted without data. Information is available on the species found in the park and on ecological systems of the type found in the area but this information is not specific to MKKS and most is out of date. While many of the threats that ecosystems and species face are similar, effective planning, management and monitoring require local level data that is regularly updated.

There is insufficient data on the MKKS forest landscape to develop detailed wildlife conservation or habitat management plans at this stage, other than the broad management actions outlined above. Over time, with more accurate data and new knowledge, a clearer picture will emerge of specific actions that are required. Since this management plan will be reviewed periodically, its recommendations will be strengthened and updated as more data becomes available.

The first step in building a knowledge base is to establish a baseline with data on the number of wildlife species found in the MKKS area, their relative abundance and population size, major habitat types and locations, and the impact of human activities (habitat destruction, hunting, fishing, poaching, human-wildlife conflict, illegal resource extraction, etc.) on each species. Larger system-wide threats to the MKKS ecosystem also need to be documented, such as the impacts of infrastructure development, environmental pollution and climate change.

A consolidated data collection plan should be developed for the entire MKKS area, with survey methods set out, data collection protocols standardised and study areas accurately mapped using GPS. The plan should include a schedule for periodic follow-up surveys so that implementation of the management plan can be monitored and course correction carried out if required.

The data should be publicly available, preferably online, so that it can be accessed by researchers, conservation experts, park managers, policy makers, government officials, international donors and all others with an interest in the park.

Research. Although research exists on many of the species found in the park and on the ecological systems in and around the MKKS area, this information is not specific to the MKKS context. Context-specific research can provide new insights on and solutions for conservation issues or concerns, such as the condition of habitats, tolerance of or sensitivity to disturbances of a particular species, area-specific threats and other local-level challenges that need to be addressed.

A strategic plan should be developed for research, focusing on issues of the highest priority but also taking feasibility into consideration (see Box 5). Research questions should be designed to provide answers that can be used to directly inform park management decisions, take new conservation actions or develop new interventions. Academic institutions and research organisations, both within and outside Pakistan, along with international conservation groups and donor agencies can be approached for financial and technical support.

Monitoring. It goes without saying that accurate and timely data collection is also essential for

monitoring the impact of conservation actions, thus allowing the success of the management plan to be assessed and revisions made if required.

A monitoring framework for the MKKS National Park Management Plan will need to be developed, setting out targets not only for administrative and operational activities but also for on-ground conservation. Baseline data used for the monitoring plan can be provisional, pending updated information to be gathered through systematic field surveys. (Administrative arrangements for monitoring and oversight are discussed in section 8.2 below.)

Box 5: Supporting knowledge creation for management and conservation of the MKKS forest landscape

It is important to create an environment that is conducive to data collection and research. Knowledge creation is not merely an activity of academic interest, but has real-world payoffs in many areas including park management, monitoring effectiveness of conservation efforts and public communications.

This management plan takes a strategic approach to knowledge creation and management, which includes the following measures:

- Adopt a coordinated and collaborative approach, involving park staff and local communities, as well as local and international scientists, researchers, academic institutions, development partners, donors and funding agencies.
- Identify knowledge gaps specifically related to the MKKS forest landscape, including threats to species, habitats and ecosystems, and the impacts of climate change, to develop a list of data collection and research priorities.
- Prioritise applied research projects that directly address park information or management needs.
- Facilitate national and international scientists, including by expediting research permits and other requirements.
- Develop mechanisms for the exchange of information and feedback between park management and researchers to strengthen management and inform targeted research.

Management actions: Developing a knowledge base

Develop and regularly update a knowledge base on ecosystem integrity, wildlife populations and biodiversity in the MKKS area to more effectively plan and monitor conservation efforts

Action	Lead actor(s)	Timeline	Indicators of success
Design and implement an integrated monitoring system for the ecology of the park area (climate, rainfall, vegetation, ecological threats), wildlife and biodiversity, using modern methods and technology	Park authorities, in partnership with research institutions, ecology and wildlife experts, with support from conservation organisations, NGOs	By mid-2023	• Monitoring framework in place
Compile a list of priority research areas relevant to the park	Park authorities, in partnership with research institutions, ecology and wildlife experts	By end 2023	• Research priorities list developed and disseminated • Number of research proposals received
Train staff and implementing partners in the use of the monitoring system and begin data collection; make data publicly available	Park authorities, in partnership with research institutions, ecology and wildlife experts, supported by conservation organisations, NGOs	By 2024	• Staff trained • Monitoring reports available
Promote independent research (national, international) and make the necessary permits and facilities available	Park authorities, government	Start in 2024, and then continuous	• Number of priority research projects being undertaken • Number of peer reviewed publications

5.7 SPECIES OF CONSERVATION IMPORTANCE

This section provides a brief description of key species in the park area that are vulnerable or threatened with extinction, outlining key actions that are required for their protection. As noted in section 5.6 above, there is not enough data available on the MKKS forest landscape and the status of individual species in the area to develop comprehensive conservation and protection plans at this stage.

The species discussed in this section, and others that are reported in the park area and are vulnerable or threatened with extinction according to the IUCN Red List, should be the focus of data collection and research as a matter of priority. Once data is collected, detailed species-specific management and conservation plans will be developed, and pilot conservation projects launched as appropriate. (For a list of species recorded during research conducted for the development of this management plan and their IUCN conservation status, see Annex 3.)

5.5.1 COMMON LEOPARD

The common leopard is the largest predator in the area and plays an important role in maintaining the health of the ecosystem. It helps to control herbivore populations and eliminate weak or unhealthy animals. A balanced population of wild herbivores is critical to the health of forest systems to prevent overgrazing, which disrupts the natural cycle of forest regeneration and growth. Predation of weak animals also keeps diseases from spreading and maintains a population of healthy wild animals.

Common leopard
Scientific name: *Panthera pardus*
Local name: Seenh
Conservation status: Vulnerable Critically endangered in Pakistan
Key threats: • Habitat destruction • Illegal hunting • Decline in prey species • Human-wildlife conflict
Status under Punjab law: Protected

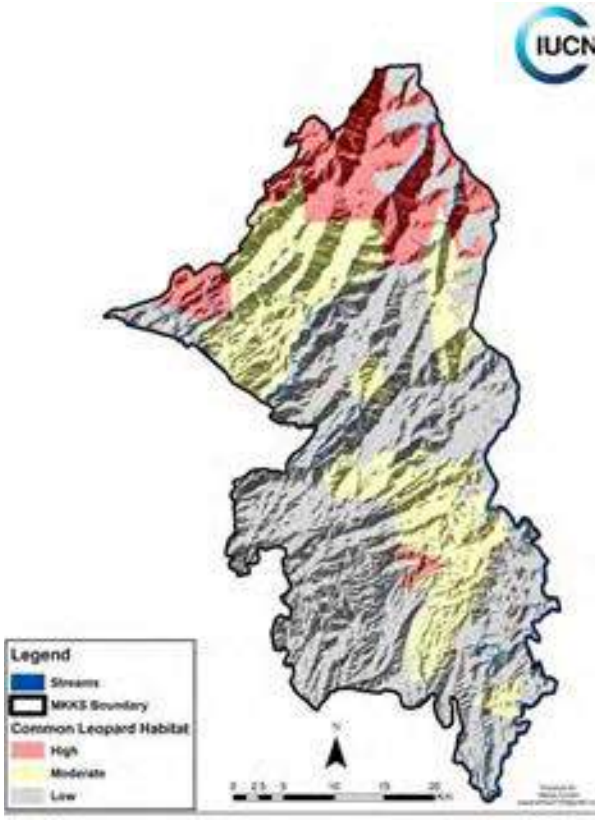
- **Distribution**

Leopards were once found across the country in a variety of habitats in every province and territory (Roberts 1997). But population numbers have declined dramatically and today the leopard is classified as critically endangered in Pakistan (Dar 2005).

- **Threats**

The main reason for the decline in leopard numbers is habitat loss as a result of widespread deforestation. Today, only about 2.5% of the country's original forests remain, with forest cover continuing to decline at an annual rate of 2.1%

Figure 9: Common Leopard habitat locations



(FAO 2007). Human population pressures further encroach on wildlife habitats, with residential settlements expanding and communities increasingly relying on forest resources for their subsistence. As habitats are destroyed or degraded, prey species numbers decline, pushing predators like the leopard into smaller and smaller ranges, and in many cases causing local predator populations to disappear altogether.

Human encroachment also leads to an increase in human-wildlife conflict. Communities depending on livestock rearing see the leopard as a threat to their livelihoods. There is no system of financial compensation for owners who lose livestock to predator attacks. This undermines leopard conservation efforts and causes local communities to resent the animal.

Leopard attacks on humans occur occasionally and several leopards are poisoned or shot annually in reprisal (Lodhi 2007). Six leopard deaths were reported in Ayubia National Park and the surrounding forest in just one year, between November 2011 and December 2012, after two children were attacked and killed. There have been fewer reports more recently, partly because leopard numbers have declined significantly over the last decade.

Other threats to leopards include poaching, trapping cubs for animal dealers, and the trade of body parts and skins. Skin, claws, and teeth are available for sale in markets in northern Pakistan.

Leopards are protected under the law but rules and regulations are poorly implemented. Key issues include lack of resources and the limited management capacity of local wildlife offices.

- **Key conservation action: reduce human-wildlife conflict**

Active engagement with communities is essential to ensure that effective mechanisms are in place to minimise incidents of conflict. It is important to be responsive to the concerns of communities experiencing animal attacks, and to provide fair and equitable compensation for losses incurred.

5.7.2 BARKING DEER

The barking deer gets its name from its distinctive call, similar to a dog bark, which it gives when it senses a predator or other threat. It is omnivorous, feeding on grasses, prickly bushes, low growing leaves, bark, twigs, herbs, fruit, sprouts, seeds, tender shoots, bird eggs and small mammals. The animal is typically found feeding at the edge of the forest or in abandoned clearings.

Although globally the barking deer is listed as a species of least concern in the IUCN Red List, it is endangered in Pakistan (Sheikh and Molur 2004). Barking deer numbers in the country are in steep decline. According to a survey being conducted by the Ministry of Climate Change, only 300 to 400 animals have been spotted in various ranges and national parks across the country (The News 2022).

Barking deer

Scientific name: *Muntiacus vaginalis*

Local name: Kakar

Conservation status: Least concern
Endangered in Pakistan

Key threats:
- Illegal hunting
- Habitat destruction

Status under Punjab law: Protected

- **Distribution**

The barking deer is restricted to a narrow range in Pakistan, found in hilly country with dense scrub. It prefers the southern hillslopes, which carry relatively denser vegetation, and comes to the edge of the woods in the mornings and evenings to forage.

Isolated populations of barking deer are reported in the Margalla Hills National Park (Islamabad Capital Territory), the Khanpur Range (Khyber Pakhtunkhwa province) and Lehtrar (Punjab). Other small populations are reported across AJK in the Pir Lasura National Park and the districts of Bhimber, Kotli and Mirpur (Zulfiqar et al. 2011). A map of barking deer habitat locations in the MKKS area is shown in Figure 9.

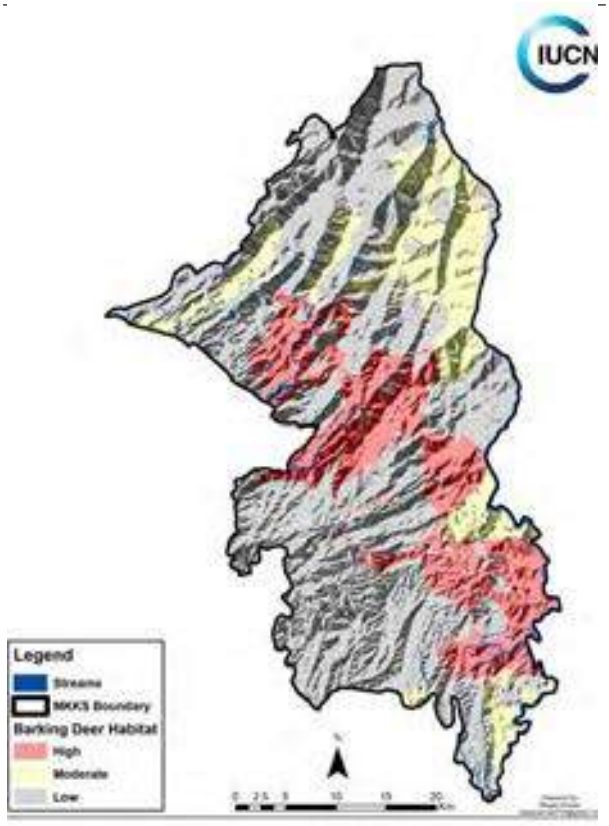
- **Threats**

The decline in barking deer populations in Pakistan is mainly the result of illegal hunting and widespread habitat destruction. Forest damage, the pollution of water sources and overgrazing by livestock are the major cause of habitat destruction (Zulfiqar et al. 2011). Poaching is a serious threat (The News 2022).

- **Key conservation actions: protect habitat and combat illegal hunting**

It is essential to ensure the involvement of local communities in actions to protect the species and its habitat. This includes strictly enforcing wildlife laws and minimising human intervention in core areas.

Figure 10: Barking deer habitat locations



It is also important to monitor species numbers through annual wildlife surveys. Once these basic systems are in place and populations rebound, longer term measures can be considered, such as the introduction of trophy hunting with the proceeds to be distributed equitably among local communities.

5.7.3 INDIAN PANGOLIN

The Indian pangolin is a type of anteater, subsisting on ants, termites and beetles. It is a unique species that plays a critical role in maintaining ecosystem health by consuming insects and serving as natural form of pest control. It also helps improve soil quality by mixing and aerating soils as it forages.

The pangolin can be found in tropical forests as well as open land, grassland and degraded habitat, including in close proximity to human settlements.

- **Distribution**

In Pakistan, the pangolin is reported in all four provinces. It can be found in and around the districts of Gujrat, Jhelum and Sialkot (northwest Punjab), and across the Salt Range into the districts of Attock, Kohat, Mardan and Peshawar (Khyber Pakhtunkhwa). It is reported in Dadu and Larkana districts (Sindh), and the districts of Lasbela and Makran (Balochistan). Some districts in AJK also report populations (Roberts 1997).

Indian pangolin
Scientific name: *Manis crassicaudata*
Local name: Sala
Conservation status: Endangered
Key threats: • Illegal hunting and trade • Habitat destruction • Low conservation priority
Status under Punjab law: Protected

- **Threats**

Major threats to the pangolin are illegal hunting and the illegal international trade in wildlife. The animal's scales are used in traditional Chinese medicine. It is also often killed simply out of fear, owing to its unusual appearance, even though it is harmless to humans. Superstition and misinformation about the animal also lead to its killing when it is spotted near human settlements, as many believe, wrongly, that it excavates graves and feeds on human remains (The Third Pole 2019).

- **Key conservation action: combat illegal hunting and killing**

Work with local communities to create awareness about this unique and benign animal, and to dispel myths surrounding its behaviour. At the same time, it is essential to tackle poaching for the illegal international trade, which should be addressed through strict enforcement of wildlife laws as well as the creation of alternate income generating opportunities for local communities.

5.7.4 KALIJ PHEASANT

The Kalij pheasant lives in dense undergrowth, usually near hill streams, concealing its nest under bushes or overhanging roots. It prefers to hide in tall grass but flies short distances in search of food. It is omnivorous, feeding on insects, larvae, worms and small lizards as well as seeds, berries, grasses, shrubs, roots and seeds. It is active mainly in the evening and early morning, and is highly noisy and vocal early in the morning.

Although listed as a species of least concern in the IUCN Red List (IUCN 2022b), populations globally are declining (BirdLife International 2022). In Pakistan as well, this once common bird is now rare and found in only a few areas.

- **Distribution**

Once occurring in good numbers across the northern parts of the country, the main surviving population ranges from the Margalla Hills to Lehtrar, and around the towns of Ghora Gali, Kahuta and Panjar (Punjab). It is also reported in the lower reaches of the Machiara and Neelum valleys and on the Jhelum River at Pir Chinasi (AJK).

- **Threats**

The major threat to the species comes from habitat loss, resulting in declining populations. Illegal hunting is also a problem. Most pheasant species are hunted for food and some are hunted or trapped for trade in flesh, plumage or as live birds.

Kalij Pheasant
Scientific name: *Lophura leucomelanos*
Local name: Ban kukar
Conservation status: Least concern Rare in Pakistan
Key threats: • Habitat destruction • Illegal hunting
Status under Punjab law: Protected

- **Key conservation actions: protect habitat and combat illegal hunting**

Ensure the involvement of local communities for the protection of the species and its habitat. This includes strictly enforcing wildlife laws and minimising human intervention in core areas.

Although the Kalij pheasant is a species of least concern globally (IUCN 2022b), it is designated as rare in Pakistan and protected under Punjab law. Annual surveys are required to monitor species numbers. Once basic protection and monitoring systems are in place, and if populations rebound, the feasibility of introducing a sustainable harvesting programme can be considered, allowing strictly monitored and locally franchised hunting with proceeds to be shared equitably among local communities.

5.7.5 MAHSEER

The mahseer is the national fish of Pakistan. Its name is derived from two Persian words, 'mahi' (fish) and 'seer' (tiger, pronounced sher). It is robust and full of strength and energy, considered a tiger among fish owing to its personality which is described by anglers as reckless and impetuous. Records exist of specimens up to 9 feet in length and over 50 kg in weight but today the fish caught are much smaller (Dawn 2010).

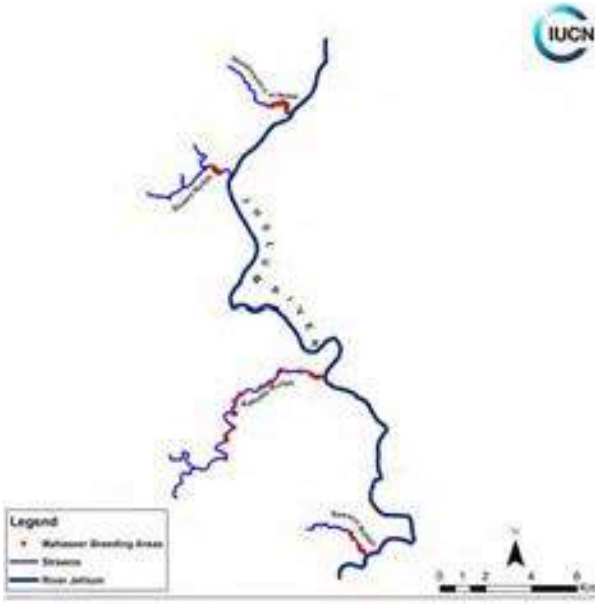
It is a commercially important game species as well as an esteemed food fish. Although once abundant in rivers and lakes across Asia, today it is categorised as endangered in the IUCN Red List (IUCN 2022b).

- **Distribution**

The mahseer inhabits streams and rivers in montane and sub-montane regions. Until the 1970s, it was abundant in the rivers of AJK, Balochistan and Khyber Pakhtunkhwa. But numbers have plummeted and today the mahseer is scarce in most parts or the country. The only sizeable and stable population that remains is found in the Poonch River in AJK (Dawn 2010).

Mahseer
Scientific name: *Tor putitora*
Local name: Mahasher
Conservation status: Endangered Critically endangered in Pakistan
Key threats: • Illegal fishing, overfishing • Habitat destruction • Climate change
Status under Punjab law: Not fully protected

Figure 11: Breeding Areas of Mahseer in Tributaries of River Jhelum



- **Threats**

The main threats to the species come from habitat loss, including the destruction of spawning grounds and nurseries. Overfishing is also a serious problem, with numerous incidents of illegal fishing reported in the MKKS area.

The ESIA of the Karot project states that based on current trends, and with the construction of more hydropower projects, the population may decline by up to 80%. The ESIA also states that the species is in need of urgent conservation efforts to prevent it from facing extinction in Pakistan (Hagler Bailly Pakistan 2017).

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6. Tourism

Objective 2: Development and promotion of community-based sustainable tourism

The MKKS National Park is an area of outstanding natural beauty. Developing tourism in the park will not only allow the public to enjoy this landscape and its rich wildlife, but will also help to generate much needed income.

Funds generated can be used for park management, to support the livelihoods of local communities, and to top up financing for various schemes and initiatives related to the conservation and protection of park resources. Tourism will also generate jobs in the area, open up business opportunities and attract investment.

Another important benefit of promoting tourism in the park is that it will strengthen the resolve of local communities to participate in efforts to protect the area and conserve its resources. Raising the profile of the MKKS National Park will also build political will to support conservation actions, and help to draw funding from conservation organisations and donors.

There are no official statistics on tourist activity in the park but anecdotal reports suggest that current visitor numbers are low and most visitors are local. Visitors use their own transport and there are few accommodation facilities.

While tourism in the park needs to be developed, it is essential that encouraging visitors and building facilities does not damage the land, pollute the water, or create a threat or disturbance to wildlife (see Box 6). Sites for infrastructure and facilities must be carefully selected to ensure that they cause the least amount of environmental damage. Under no circumstances should wilderness areas, critical habitats, core zones or wildlife corridors be encroached upon or interfered with. Facilities will also be required to handle solid waste, which is increasingly a serious problem in tourist sites across the country.

At the same time, measures will be required to minimise the negative impact on the environment. Particularly in Pakistan, natural areas with heavy tourist traffic are badly degraded and public awareness is poor. It is critically important that tourism development plans include campaigns and other measures to educate visitors about the environment, and to control plastic pollution and the indiscriminate dumping of garbage in the landscape.

Box 6: Sustainable tourism

Ensuring sustainability requires taking into consideration the environmental, socio-cultural and economic aspects of tourism development, seeking to find a balance between these three dimensions.

The World Tourism Organization defines sustainable tourism as “tourism that takes full account of the current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities” (UNWTO n.d.).

Sustainable tourism is also included in the United Nations Sustainable Development Goals (SDGs). SDG Target 8.9 aims to “by 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products” (SDSN n.d.). SDG Target 12.b which aims to “develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products” (SDSN n.d.).

Management actions: Sustainable tourism			
Develop sustainable tourism and identify ecotourism sites to promote activities that generate revenue without harming the environment, damaging habitat or threatening wildlife			
Action	**Lead actor(s)**	**Timeline**	**Indicators of success**
Identify sites suitable for ecotourism in and around the park area	Park authorities, in partnership with tourism department, with support from conservation organisations, NGOs	By end 2023	• Sites identified and mapped
Develop an ecotourism strategy, creating jobs and ensuring sustainable livelihood opportunities for area residents and local communities	Park authorities, in partnership with tourism department, supported by conservation organisations, NGOs	By mid 2024	• Implementation plan developed

6.1 RECREATIONAL AND ADVENTURE TOURISM

There are a number of places of interest in and around the MKKS National Park. Some of these sites are suitable for all visitors while others are more difficult to access but ideal for adventure tourism and activities such as mountain climbing, hiking and camping. Key locations for tourist activities are listed below, with a brief description of challenges and recommendations to address them.

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6.1.1 GEDAR PURA FOREST TRACK

This track starts 27 km from Kahuta. About 2.5 km can be covered by jeep or on foot. The track passes through dense mixed chir and broadleaf forest, and opens onto a view of the Karot Dam reservoir, Rajjgarh Valley and the Jhelum River at the foothills of the forest.

- **Activities:** Jeep trekking, hiking, camping, wildlife watching, horse riding, local honey, traditional food.
- **Challenges:** The jeep trek is difficult, best navigated by expert local drivers. There is no natural gas or LPG and fuelwood is used for cooking. There are no shops or hotels in the area, and no accommodation available for visitors.
- **Recommendations:** Improve jeep and hiking tracks; provide local guide services; raise environmental awareness to prevent pollution and littering.

6.1.2 RAJJGARH DAM RESERVIOR AND CHIR FOREST TRACK

The track starts 29 km from Kahuta and passes through mixed chir and broadleaf forest. About 4 km of the track can be covered by jeep. It offers views of the Karot Dam reservoir and the Jhelum River at the foothills of the forest.

- **Activities:** Jeep trekking, camping, boating, fishing, wildlife watching, local honey, traditional food.
- **Challenges:** The jeep trek is difficult, best navigated by expert local drivers. There is no natural gas or LPG and fuelwood is used for cooking. There are no shops or hotels in the area, and no accommodation available for visitors.
- **Recommendations:** Improve jeep and hiking tracks; provide local guide services; raise environmental awareness to prevent pollution and littering.

6.1.3 GOON FOREST JEEP TRACK

This track starts 34 km from Kahuta, 3 km of which is jeep track. It passes through subtropical broadleaf forest and enters chir forest. The end point offers scenic views of the Jhelum River.

- **Activities:** Jeep trekking, hiking, camping, wildlife watching.
- **Challenges:** There is no accommodation in the area.
- **Recommendations:** Improve jeep and hiking tracks; provide local guide services; raise environmental awareness to prevent pollution and littering; promote nature-based activities for students and children; develop adventure tourism.

6.1.4 CHANNI FOREST TRACK

Starting 37 km from Kahuta, this track passes through subtropical broadleaf forest, ending in a scenic view of the Jhelum. About 2 km can be covered by jeep and 2.5 km is suitable for hiking.

- **Activities:** Jeep trekking, hiking, camping, wildlife watching.
- **Challenges:** There is no accommodation in the area.
- **Recommendations:** Improve jeep and hiking tracks; provide local guide services; raise environmental awareness to prevent pollution and littering; promote nature-based activities for students and children; develop adventure tourism.

6.2 RELIGIOUS TOURISM

Religious tourism is a thriving industry across the country though only a few large shrines and other places of religious significance see large numbers of visitors. There are many smaller sites that are yet to be properly developed to attract visitors, a few of which are dotted around the MKKS area.

6.2.1 HAZRAT MAI BEGUM SAHIBA'S SHRINE, CHATRANA

The shrine of Hazrat Mai Begum Sahiba is in the small village of Chatrana, in the Beor union council near Kahuta. The shrine is 3 km from the main chowk (square) in Beor and 31 km from Kahuta on main Kahuta—Kotli road.

Devotees of Hazrat Mai Begum visit the shrine throughout the year but great numbers arrive during the annual Urs (festival) which starts on the first Thursday of June.

Besides offering fatiha (prayers) at the shrine, there are other events to attend during the festival, including volleyball and kabaddi matches, qawwali recitals, and a temporary bazar outside the shrine area set up by local residents. Langar (free food) is also provided to visitors.

- **Challenges:** Crowd management, plastic pollution.
- **Recommendations:** Provide local guide services; raise environmental awareness to prevent pollution and littering.

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7. Resource Use

Objective 3: Sustainable use of natural resources with equitable benefit sharing among all stakeholders

Over-exploitation of natural resources in the MKKS area has led to the degradation of the landscape and habitats, affecting wildlife populations and the overall health of the forest ecosystem. Steps are required to curb the unchecked extraction of resources so that forest cover and wildlife numbers can rebound and the ecosystem can recover.

At the same time, it is important to acknowledge that communities residing in the vicinity of the park rely on its resources for their subsistence. Allowing some form of sustainable use is essential, not least because without reasonable access rights it will be difficult if not impossible to create ownership of the park among area residents and build momentum for and interest in protecting its resources with a view to the long term (see Box 7).

Box 7: Sustainable use of park resources and the rights of local communities

There should always be parts of a protected area that are set aside as hunting-free sanctuaries (i.e., core zones) to serve as reservoirs for threatened species. But completely denying harvesting rights to local people who have traditionally enjoyed these rights is counterproductive. Regulations will be ignored, leading to competition between hunters over dwindling resources. This is the 'tragedy of the commons' that often results in the depletion or exhaustion of natural resources in the face of increasing and unregulated human exploitation (Hardin 1968).

An effective way to address this problem is to give local communities greater control over how natural resources in their areas are accessed and used. This is more likely to deliver a sustainable solution that strengthens protection of threatened or vulnerable species while also securing the livelihoods of resource dependent communities.

In setting up protected area management arrangements, it should be a priority to recruit staff from the immediate surrounds of the park. Local residents have a vested interest in protecting their area from over-exploitation since these resources provide them with sustenance. They are also uniquely qualified to police the area as they can recognise outsiders and non-rightsholders who may enter the park. An added incentive is the prospect of permanent employment, and thereby a regular income, as park staff.

In the buffer zone, the feasibility of sustainable harvesting programmes should be explored for species that are not threatened or vulnerable. Allowing strictly monitored and locally franchised hunting in areas badly affected by illegal hunting can allow the overall level of harvesting to be more effectively controlled.

No matter what schemes are introduced, it is essential to include local communities in the planning process. Widespread consultations should be held, involving area residents as well as subject experts along with representatives of government departments and conservation organisations or NGOs.

Introducing new schemes for community-led sustainable resource use may require laws to be amended or new legal instruments to be enacted. In such cases lobbying with the relevant authorities will be needed.

It makes intuitive sense that hunting will reduce populations in the wild and this is certainly the case for endangered species. But for species that are not vulnerable or threatened, hunting poses a significant threat only when large numbers of animals are taken, when pregnant or lactating females are hunted, or when very young animals are captured or killed. Under certain conditions, it may also be necessary to cull animals in order to avoid a catastrophic population collapse, as in cases when the land or wilderness area does not have the capacity to support a wildlife population beyond a certain limit.

Counterintuitively, in some instances conservation efforts can be supported through strictly regulated hunting because the economic benefits provide an incentive for habitat improvement and other activities that increase wildlife populations. This is the so-called 'paradox of wise use' (Aebischer 1997).

Regardless of the measures adopted, they are destined to fail if local communities are excluded from a role in decision making and from an equitable share in the economic benefits.

According to the Punjab Protected Areas Act 2020, resource extraction within a national park is strictly regulated (see Box 8). Forest management and the extraction of forest produce are permitted as long as such activities do not "impair the object of the establishment of the park" (Section 7(5)). With this is mind, regulations for the MKKS National Park will take into account the subsistence and livelihood needs of local communities in finalising rules for resource extraction.

The construction of commercial buildings and public amenities is also permitted as long as such activities do not "impair the object of the establishment of the park" (Section 7(5)). It is important, however, that any such activities that are authorised should ensure that revenues generated are shared equitably among all stakeholders. Local residents should be given preference in the issuing of permits for such activities and in employment opportunities that may be generated. Such measures are not only in the interest of equity but will also strengthen ownership and impetus for protection and conservation among area residents.

Box 8: Punjab Protected Areas Act 2020

7. National Park. (1) The Government may, by notification in the official Gazette, declare a land owned by the Government as a national park.

(2) A notification issued under subsection (1) may only be altered or revoked by a resolution in this behalf passed by Provincial Assembly of the Punjab.

(3) The purpose of notifying a national park may be to protect an area of national or international biodiversity importance, or which contains viable samples of natural systems and scenic areas, or which is required to be protected due to the ecological integrity of one or more ecosystems.

(4) A national park shall be accessible to public for recreation, education and research subject to such restrictions as the Board may impose.

(5) The provision for access roads to and construction of rest houses, hostels, hotels and other buildings in the national park along with amenities for public may be so made and the forest therein shall be so managed, and forest produce so obtained so as not to impair the object of the establishment of the national park.

(6) The following acts shall be prohibited in a national park:
   (a) hunting of any wild animal;
   (b firing any firearm or doing any other act which may disturb any wildlife or doing any act which interferes with the breeding places;
   (c) felling, tapping, burning or in any way damaging or destroying, taking, collecting or removing any plant or tree therefrom;
   (d) clearing or breaking up any land for cultivation, mining or for any other purpose; and
   (e) polluting water flowing in and through the national park.

provided that the Government may, for specific purposes, relating to wildlife protection, authorize the doing of the acts mentioned above except clause (e).

7.1 HUNTING

Under Punjab law, hunting is prohibited in a national park (Section 7(6)(a)). Discharging a firearm is also prohibited (Section 7(6)(b)). As such, no hunting activities can be carried out within the MKKS National Park.

7.2 FISHING

In Punjab, fishing is not prohibited in a national park. The activity itself is governed by the Punjab Fisheries Ordinance 1961, as amended, which prohibits the taking of fish by destructive and dangerous methods such as the use of explosives (Section 6) or poisoning the water (Section 7). The law provides limited protections to six fish species, specifying the minimum size of specimens that may be caught during specific seasons (Section 8 and First Schedule). It is worth noting that the mahseer is listed in this schedule, even though it is classified as critically endangered in the IUCN Red List (see Box 9).

If properly regulated, fishing has the potential to generate significant revenues for the park. It can also serve as a means to boost the income of local residents and support livelihoods in the area. Certain measures will be required to ensure that this activity and the potential increase in visitor numbers do not damage habitats or cause other disturbances in the park. These include the following:

- Legal framework. Rules and regulations governing fisheries need to be updated to reflect the international conservation status of species such as the mahseer and also to strengthen enforcement mechanisms. Updated rules should include consideration of international best practices related to fishing techniques and equipment.
- Park regulations. For the MKKS National Park in particular, the park regulations that are to be drafted in the near future should take into account the ecology of the area and the status of various fish species found within the park.
- Fishing area. Fishing will only be permitted in designated areas, to be selected through consensus between park authorities, the fisheries department, fisheries experts and local communities.
- Fishing season. An open season for fishing will be decided and strictly enforced to allow fish stocks to regenerate and ensure sustainability.
- Licencing. Fishing licenses will be issued to regulate the activity and fishing without a licence will be prohibited.
- Monitoring fish stocks. Species numbers will be monitored regularly and procedures put in place to prevent overfishing.

Box 9: Punjab Fisheries Ordinance 1961

6. **Destruction of fish by explosives.** No person shall use any dynamite or other explosive substance in any water with intent thereby to catch or destroy any of the fish that may be therein.

7. **Destruction of fish by poisoning water.** No person shall put any poison, lime or noxious material into any water with intent thereby to catch or destroy any fish that may be therein.

8. **Fish that shall not be taken.** No person shall kill, capture, or possess any species of fish specified in the second column of the First Schedule, of a size less than that specified in the third column of the said Schedule against such species.

FIRST SCHEDULE (Section 8)
SPECIES OF FISH AND PROHIBITIONS

S. No	Species of fish	Size (inches)	Period during which taking of the fish by any net, cage, trap or fixed engine is prohibited
1.	Trout	9	October 10 to March 09
2.	Mahseer	12	June 01 to August 31
3.	Rahu	12	June 02 to August 31
4.	Mori	12	June 01 to August 31
5.	Thaila	12	June 01 to August 31
6.	Kalbans	12	June 01 to August 31

7.3 LOGGING

Removing timber from a national park is prohibited under the law. This includes "felling, tapping, burning or in any way damaging or destroying, taking, collecting or removing any plant or tree" (Section 7(6)(c)). This prohibition will be strictly enforced to ensure that the forest landscape and the habitats it contains are not further degraded, and to allow tree and plant species to regenerate. species to regenerate.

7.4 EXTRACTION OF SAND AND GRAVEL

The lack of a clear regulatory framework has aggravated the environmental problems caused by river sand mining and gravel extraction. In addition, sand prices have increased several times over in recent years and this has driven such activities into remote locations and fragile ecosystems.

The extraction of sand and gravel is not explicitly prohibited in a national park. However, "clearing or breaking up" land for any purpose, including mining, is prohibited (Section 7(6)(d)). This gap will be addressed in the park regulations, to be drafted in the near future.

7.5 COLLECTING NON-TIMBER FOREST PRODUCTS

Many rural communities rely on non-timber forest products to support their livelihoods. This includes foraging for food or forest products, collecting fodder and taking livestock into forested areas for grazing. Excessive extraction of forest products, and especially overgrazing, can damage or destroy ecosystems and habitats. But harvesting can be managed so as to be sustainable, without harming ecosystems and habitats while also allowing communities to supplement their household income and subsistence.

The law forbids the "taking, collecting or removing" of plants and trees from within a national park (Section 7(6)(c)). Within the buffer zone, however, such activities are not expressly prohibited (see Box 10). For the MKKS National Park, the regulations will set out the manner in which non-timber forest products may be extracted from the buffer zone, specifying the type of produce, the quantities that may be removed and the parties who are permitted to carry out such activities.

Box 10: Punjab Protected Areas Act 2020

11. Buffer zone. (1) The Government may by notification in the official Gazette declare an area adjacent to a protected area mentioned in clauses (a), (b), (c) and (g) of section 3 as a buffer zone with a specific name.

(2) The purposes of notifying a buffer zone shall be to:
- (a) regulate an area as a buffer zone for conservation and protection of a protected area;
- (b) regulate development and economic activities in the area;
- (c) protect a specific ecosystem outside of a protected area;
- (d) control change in land use in the area;
- (e) control access to the protected area; and
- (f) prepare an area for inclusion in a national park, wilderness area or any other protected area.

(3) The buffer zone shall be:
- (a) assessable to the public for watching biodiversity;
- (b) available for research and training;
- (c) available for eco-tourism; and
- (d) subject to co-management.

(4) The following acts shall be prohibited in a buffer zone:
- (a) hunting of any wild animal
- (b) using any firearm;
- (c) introducing any exotic species of animal or plant; and
- (d) polluting any water.

Management actions: Sustainable resource use

Develop policies and regulations for the sustainable use of natural resources, ensuring that local communities receive an equitable share of the benefits

Action	Lead actor(s)	Timeline	Indicators of success
Develop regulations for sport and subsistence fishing, ensuring that licencing fees and other revenues are shared equitably with local communities	Park authorities, in partnership with fisheries department	By end 2023	• Regulations developed • Number of visitors/licences issued • Benefits to local communities (case studies)
Develop a policy for the sustainable harvesting of non-timber forest products, ensuring the rights of local communities	Park authorities, in partnership with forest department	By 2025	• Policy developed • Regeneration of plants and vegetation (survey) • Benefits to local communities (case studies)

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PART III: MANAGEMENT ARRANGEMENTS

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8. Institutional Strengthening

While national park management falls under the mandate of the wildlife department, the custodian of park land is the forest department. Fisheries resources, meanwhile, are managed by the fisheries department. Since different government departments are involved, the park will be managed jointly by the three departments under co-management arrangements. This approach allows for collaborative management of all natural resources within the park, with the responsibilities of each department clearly assigned.

Co-management arrangements will need to be worked out through consultative sessions with all stakeholders. This section discusses other steps that are required to strengthen management structures. These include staff requirements for the MKKS National Park, oversight mechanisms and the preparation of regulations to govern park management. Broader measures are also required to effectively manage the park, such as working with local communities and creating awareness about conservation issues.

8.1 CLARIFYING STAFF STRUCTURE

In Punjab, national parks are managed under the supervision of the Director General of the Punjab Wildlife and Parks Department, along with two directors, three deputy directors, district wildlife officers and support staff. There are no permanent staff positions assigned to the MKKS National Park and no management plan was in place until now. There is also no budget allocated for park management so far, which will be made available in the near future.

Dedicated staff is required for the management of the park, as shown in the table below, which sets out the minimum number of staff positions necessary for effective management and the proposed government pay scale for each position. A budget will need to be set aside for staff salaries and other benefits, which should be included in the overall budget for the park.

8.2 MONITORING AND OVERSIGHT

Three separate bodies will be established to monitor and oversee park management. This includes a committee to manage day-to-day operations, a higher-level forum where strategic decisions are taken and a consultative forum bringing together all stakeholders in an advisory capacity as and when their input is required.

Proposed staff structure for park management

Post	Grade (BPS)	Number of positions required
Park Director	19	1
Park Manager	18	1
Wildlife Manager	17	1
Range Management Officer	16	3
Fisheries Officer	17	1
Tourism Officer	17	1
Education Officer	17	3
Wildlife Supervisor	16	3
Range Forest Officer	16	1
Park Inspector	11	2
Game Watcher	3	20
Office Assistant	11	2
Senior Clerk	7	2
Junior Clerk	5	2
Driver	4	2
Naib qasid (office assistant)	2	4
Chowkidar (guard)	1	3

8.2.1 MANAGEMENT COMMITTEE

The Management Committee is responsible for operational decision making. It will consist of senior officials from the relevant government departments (forest, wildlife, fisheries, agriculture, education, local government, rural development, etc.), who will jointly take decisions about the park. The committee will include representatives from law enforcement agencies, as well as scientists and technical experts.

The committee will meet every three months to ensure effective coordination and timely decision making. The chairperson will rotate annually between representatives from each department, with that department serving as the secretariat for the duration. Minutes of all meetings will be shared with the Strategic Forum and Consultative Forum (discussed sections 8.2.2 and 8.2.3 below).

The Management Committee should strive to achieve an integrated management approach, avoiding inter-departmental competition and turf wars, and instead embracing the true spirit of co-management.

8.2.2 STRATEGIC FORUM

The role of the Strategic Forum is to review the annual work plan and budget, and proposed amendments to the management plan, as submitted by the Management Committee. The Strategic Forum may approve, reject or call for amendments to these submissions. It will meet once a year.

The forum will consist of representatives from all relevant government departments, along with representatives from the development and private sectors. The development sector representatives will have expertise in ecosystems, biodiversity, conservation and socio-economic issues related to park management. The private sector representative will be an expert on tourism and business issues. The Management Committee will serve as the secretariat of the Strategic Forum.

8.2.3 CONSULTATIVE FORUM

The Consultative Forum will play an advisory role. It will serve as the formal mechanism for consulting with key stakeholders and will foster a participatory approach to park management. This will be an inclusive forum, welcoming all those who have insights and solutions to offer.

The forum will meet at least once a year but may be convened as and when required. The main purpose of Consultative Forum meetings is to assess progress towards achieving management objectives, solve problems, mobilise the skills and expertise of stakeholders and partners, and capitalise on opportunities that may arise to build partnerships or seek support for the park. It will also act as a brain trust for the Management Committee, which will draw on the knowledge and expertise of forum members and carefully consider any advice or guidance offered. The Management Committee will serve as the secretariat of the Consultative Forum.

Management actions: Monitoring and oversight

Strengthen institutional arrangements for effective management, oversight and strategic planning

Action	Timeline	Record of progress
Establish Management Committee and agree on TOR	Mid 2023	• Management Committee operational
Establish Strategic Forum and agree on TOR	Mid 2023	• Strategic Forum operational
Establish Consultative Form and agree on TOR	Mid 2023	• Consultative Forum operational
Prioritise areas requiring co-management (issues, species, resources) and agree on co-management arrangements	End 2023	• Co-management agreements signed
Establish practical and efficient operating procedures for collaboration, communication and reporting	Mid 2024	• Reporting documents developed and disseminated

8.3 PARTNERSHIPS WITH LOCAL COMMUNITIES

It is essential that local communities are involved and engaged in the management of the park. Without community participation, it will be difficult if not impossible to ensure the long-term success of the management systems put in place. Community engagement is also a matter of equity, since area residents have long held traditional rights to enter the park area and extract resources for their subsistence.

The planning of income generating activities must also include the maximum possible opportunities for area residents and local communities. This includes issuing licences and franchises for commercial activities as well as hiring staff for these operations.

To begin with, engagement efforts should include the communities living around the core zones of the MKKS National Park, in the villages of Gedar Pura, Goon, Rajjgarh, Salgran and Sawerhi.

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Management actions: Partnerships with local communities

Develop partnerships with area residents to build ownership of conservation efforts, seek community feedback and strengthen participatory management

Action	Lead actor(s)	Timeline	Indicators of success
Reach out to local communities and develop participatory management agreements	Park authorities, in collaboration with community leaders, with support from NGOs	Start in 2023, and then continuous	• Number of partnership agreements signed • Number of communities participating in conservation activities

8.4 CREATING AWARENESS ABOUT THE PARK

Park boundaries have not been properly demarcated and few area residents are aware that they live in the vicinity of a protected area. Awareness needs to be created about the status of the land, about rules that apply to its use and about activities that are prohibited. This applies not only to the communities residing in the immediate environs of the park, including in the buffer zone, but also to the wider community of citizens in the towns and villages around the MKKS area.

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Management actions: Creating awareness about the park

Conduct campaigns to inform area residents and tourists about the existence of the park and the rules that apply within its boundaries, and to improve public awareness about the importance of conservation

Action	Lead actor(s)	Timeline	Indicators of success
Launch information and awareness campaigns on various aspects of conservation and park management	Park authorities, with support from conservation organisations, NGOs	Start in 2022, and then continuous	• Knowledge about the status of the area improves (survey) • Interest in conservation increased (survey, case studies)

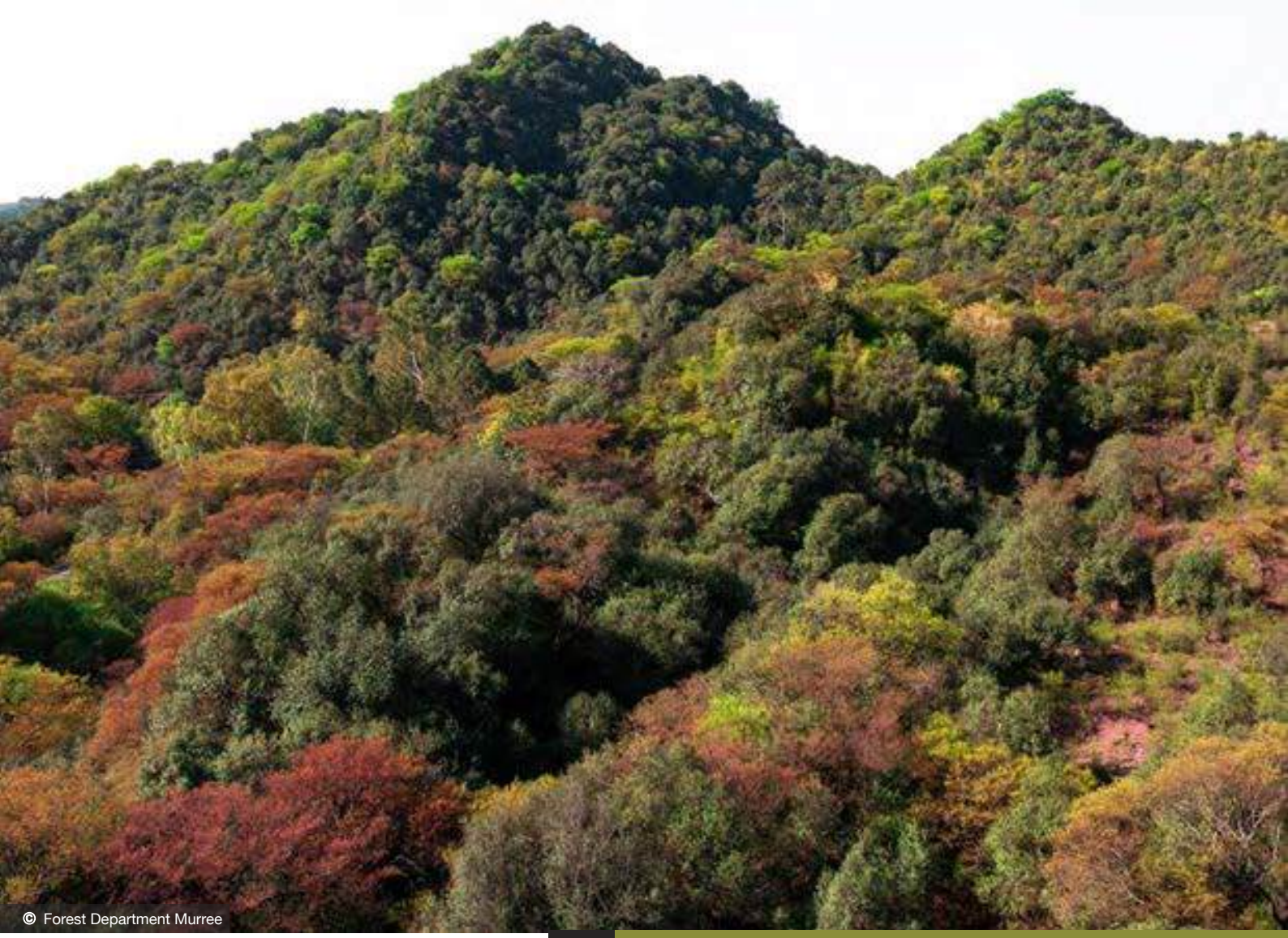
8.5 DEVELOPING PARK REGULATIONS

As noted above, regulations for the MKKS National Park will be drafted in the near future. These regulations will be developed keeping in mind provincial protected areas laws, as well as legislation governing wildlife, fisheries, forests and other relevant legal instruments, while setting out rules that take into consideration specific requirements for the effective restoration, management and conservation of the MKKS forest landscape and the wildlife species found within it.

Management actions: Developing park-specific regulations

Develop regulations to protect biodiversity in the MKKS National Park and to regulate access to and use of park resources

Action	Lead actor(s)	Timeline	Indicators of success
Conduct stakeholder consultations for the development of park regulations	Park authorities, in consultation with stakeholders, with support from conservation organisations	Start in 2023	• Consultative sessions held
Draft park regulations and circulate for comments and stakeholder feedback	Park authorities, wildlife and forest departments	By 2025	• Draft developed and circulated
Finalise draft regulations and have them notified	Park authorities, wildlife and forest departments	By 2026	• Regulations notified



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Glossary of Key Terms

Biodiversity	Biological diversity; refers to the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; includes diversity within species, between species and of ecosystems
Biodiversity law	Legal instruments and mechanisms regulating certain behaviour, providing incentives to achieve conservation objectives and providing for the establishment of institutions to respond to conservation needs; includes laws, rules, regulations and byelaws
Biological resources	Refers to genetic resources, organisms or parts thereof, populations or any other biotic component of ecosystems with actual or potential use or value for humanity
Biotechnology	Any technological application that uses biological systems, living organisms or derivatives thereof to make or modify products or processes for specific use
Decision	Formal expression of the will of the governing body of an international organisation or international agreement. Decisions are generally binding but may occasionally be ‘soft law’
Ecosystem	A dynamic complex of plant, animal and microorganism communities and their non-living environment, interacting as a functional unit
Ecosystem services	Benefits that people obtain from the ecosystem; includes provisioning services, such as food, water, timber and fibre; regulating services that affect climate, floods, disease, waste and water quality; cultural services that provide recreational, aesthetic and spiritual benefits; and supporting services, such as soil formation, photosynthesis and nutrient cycling

Ecotourism	Responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education
Ex-situ conservation	Conservation of components of biological diversity outside their natural habitats
Genetic resource	All living organisms (plants, animals, microbes) carrying genetic material that could potentially be of use to humans
In-situ conservation	Conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties
Legal	Biodiversity processes that conform to the law, are done according to law, are required or permitted by law, are not forbidden by law, or are good and effectual in law
Measure	The rule by which biodiversity processes are governed, adjusted or proportioned
Multilateral environmental agreement	Treaties, conventions, protocols and other binding instruments related to the environment.
Policy	General principles by which a government is guided in the management of public affairs, the application of laws, and the implementation of measures
Policy instrument	Interventions made by a government or public authority at the local or national level with the aim to achieve outcomes that conform to national objectives related to biodiversity
Protected area	Geographically defined area that is designated or regulated and managed in such a way as to achieve specific conservation objectives
Sustainable use	The use of components of biological diversity in a way and at a rate that does not lead to a long-term decline in biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations

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Annexes

ANNEX 1: STAKEHOLDER MEETINGS AND CONSULTATIONS

As the implementing organisation for the Karot Hydropower Project biodiversity management plan, IUCN has conducted extensive consultations with a wide range of stakeholders over a period of two years. Key meetings and consultative workshops held specifically for the purpose of developing the management plans are shown in the table.

Meetings and consultations for the development of the management plans	
Date	**Consultations**
June 16, 2021	Member Environment, Planning and Development Board, Punjab Secretary Forest, Wildlife and Fisheries Department, Punjab
June 17, 2021	Secretary, Environment Protection Department, Punjab Director General, World Wide Fund for Nature, Pakistan
June 18, 2021	Additional Chief Secretary (General), AJK Secretary Forest, Wildlife and Fisheries Department, AJK Secretary Agriculture, AJK
November 29, 2021	Consultative workshop with stakeholders
November 10-11, 2021	Two training workshops on human-wildlife conflict data collection
August 12, 2021	Secretary Forest, Wildlife and Fisheries Department, AJK
September 09, 2021	Director General Punjab Wildlife and Parks Department
October 01, 2021	Conservator Forest, Poonch Circle, AJK
October 04, 2021	Director Wildlife and Fisheries, AJK
October 07, 2021	Deputy Director Punjab Wildlife and Parks Department, Rawalpindi Division
October 07, 2021	Conservator Forest, Rawalpindi North Circle, Punjab
October 27, 2021	Stakeholder consultation on preparation of management plans
November 25, 2021	Divisional Forest Officer, Palandri, AJK
December 03, 2021	Director Wildlife and Fisheries, AJK
December 03, 2021	Land Use Planning Department, AJK
December 20, 2021	Sub-Divisional Forest Officer, Murree Forest Division, Punjab
December 20, 2021	Assistant Director Punjab Wildlife and Parks Department, Murree
December 22, 2021	Divisional Forest Officer, Sehnsa, AJK
December 30, 2021	Director Wildlife and Fisheries Department, AJK
December 31, 2021	GIS Expert, Land Use Planning Department, AJK
February 12-13, 2022	Wildlife survey assessment training
February 14-25, 2022	Wildlife surveys in MKKS and Azad Pattan

ANNEX 2: POLICY FRAMEWORK

International conventions and agreements
Ramsar Convention on Wetlands of International Importance (1971)
Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973)
Convention on the Conservation of Migratory Species of Wild Animals (1983)
Convention on Biological Diversity (1992)
United Nations Convention to Combat Desertification (1994)
United Nation Framework Convention on Climate Change (1994)
Kyoto Protocol to the United Nations Framework Convention on Climate Change (1997)
Beijing Declaration and Platform for Action (1998)
United Nations Millennium Development Goals (2000)
Paris Agreement to the United Nations Framework Convention on Climate Change (2015)
United Nations Sustainable Development Goals (2016)

National policies on sustainable development and environmental protection
National Conservation Strategy (1992)
Biodiversity Action Plan (2000)
National Environment Policy (2005)
Integrated Coastal Zone Management Plan for Pakistan (2011)
National Sustainable Development Strategy (2012)
National Forest Policy (2015)
National Biodiversity Strategy and Action Plan (2017)
Sustainable Development Goals (SDGs) National Framework (2018)
National Fisheries and Aquaculture Development Policy and Plan of Action (Draft 2020)
National Climate Change Policy (2021)
Updated Nationally Determined Contributions (2021)

ANNEX 3: SPECIES RECORDED

During the preparation of this management plan, field surveys were conducted in February and March 2022 to record wildlife species occurring in the park area. Line transects were used to record species. Survey teams consisted of IUCN staff, wildlife department staff and university students. In total, 47 species of birds and 17 mammals were recorded. A survey of fish species was not carried out during this exercise.

Species recorded during the field survey are shown in the tables that follow, along with their conservation status according to the IUCN Red List (IUCN 2022b). It should be noted that while many species are not threatened globally, their conservation status in Pakistan is threatened. An explanation of IUCN conservation categories is provided in Box A.

Box A: IUCN Red List conservation categories

Species are classified by the IUCN Red List into nine groups, based on criteria such as rate of decline, population size, area of geographic distribution, and degree of population and distribution fragmentation, as follows:

- Extinct (EX) – beyond reasonable doubt that the species is no longer extant
- Extinct in the wild (EW) – survives only in captivity, cultivation and/or outside native range
- Critically endangered (CR) – in a particularly and extremely critical state
- Endangered (EN) – very high risk of extinction in the wild
- Vulnerable (VU) – meets one of the 5 red list criteria and thus considered to be at high risk of unnatural (human-caused) extinction without further human intervention
- Near threatened (NT) – close to being endangered in the near future
- Least concern (LC) – unlikely to become endangered or extinct in the near future
- Data deficient (DD)
- Not evaluated (NE)

In the IUCN Red List, the term 'threatened' covers the categories of critically endangered, endangered and vulnerable.

Birds recorded (IUCN field survey)

Common name	Scientific name	Conservation status (global)
Shikra	*Accipiter badius*	LC
Common myna	*Acridotheres tristis*	LC
Black-throated bushtit	*Aegithalos concinnus*	LC
Long-billed pipit	*Anthus similis*	LC
Brown rock chat	*Cercomela fusca*	LC
White-capped redstart	*Chaimarrornis leucocephalus*	LC
Large-billed crow	*Corvus macrorhynchos*	LC
House crow	*Corvus splendens*	LC
Common quail	*Coturnix coturnix*	LC
Grey-headed canary-flycatcher	*Culicicapa ceylonensis*	LC
Rufous treepie	*Dendrocitta vagabunda*	LC

Common name	Scientific name	Conservation status (global)
Grey-capped pygmy woodpecker	*Dendrocopos canicapillus*	LC
Fulvous-breasted woodpecker	*Dendrocopos macei*	LC
Black-rumped flameback	*Dinopium benghalense*	LC
Rock bunting	*Emberiza cia*	LC
Reed bunting	*Emberiza schoeniclus*	LC
Asian koel	*Eudynamys scolopaceus*	LC
Red-throated flycatcher	*Ficedula albicilla*	LC
Asian barred owlet	*Glaucidium cuculoides*	LC
Himalayan griffon vulture	*Gyps himalayensis*	NT
Barn swallow	*Hirundo rustica*	LC
Brown-fronted woodpecker	*Leiopicus auriceps*	LC
Red-billed leiothrix	*Leiothrix lutea*	LC
Kalij pheasant	*Lophura leucomelanos*	LC
Great barbet	*Megalaima virens*	LC
Black partridge	*Melanoperdix niger*	VU
White wagtail	*Motacilla alba*	LC
Rufous-bellied niltava	*Niltava sundara*	LC
Variable wheatear	*Oenanthe picata*	LC
Common tailorbird	*Orthotomus sutorius*	LC
House sparrow	*Passer domesticus*	LC
Indian peafowl	*Pavo cristatus*	LC
Grey partridge	*Perdix perdix*	LC
Long-tailed minivet	*Pericrocotus ethologus*	LC
Blue-throated barbet	*Psilopogon asiaticus*	LC
Grey-hooded warbler	*Phylloscopus xanthoschistos*	LC
Rusty-cheeked scimitar babbler	*Pomatorhinus erythrogenys*	LC
Black-throated accentor	*Prunella atrogularis*	LC
Slaty-headed parakeet	*Psittacula himalayana*	LC
Red-vented bulbul	*Pycnonotus cafer*	LC
Himalayan bulbul	*Pycnonotus leucogenys*	LC
White-throated fantail	*Rhipidura albicollis*	LC

Common name	Scientific name	Conservation status (global)
Grey bush chat	*Saxicola ferreus*	LC
Indian robin	*Saxicoloides fulicatus*	LC
Brahminy starling	*Sturnia pagodarum*	LC
Jungle babbler	*Turdoides striata*	LC
Eurasian hoopoe	*Upupa epops*	LC

Mammals recorded (IUCN field survey)		
Common name	**Scientific name**	**Conservation status (global)**
Golden jackal	*Canis aureus*	LC
Kashmir flying squirrel	*Eoglaucomys fimbriatus*	LC
Jungle cat	*Felis chaus*	LC
Northern palm squirrel	*Funambulus pennantii*	LC
Indian crested porcupine	*Hystrix indica*	LC
Indian hare	*Lepus nigricollis*	LC
Rhesus macaque	*Macaca mulatta*	LC
Indian pangolin	*Manis crassicaudata*	EN
Yellow-throated marten	*Martes flavigula*	LC
Barking deer	*Muntiacus muntjac*	LC
Masked palm civet	*Paguma larvata*	LC
Common leopard	*Panthera pardus*	VU
Brandt's hedgehog	*Paraechinus hypomelas*	LC
Indian flying fox	*Pteropus giganteus*	LC
Wild boar	*Sus scrofa*	LC
Small Indian civet	*Viverricula indica*	LC
Red fox	*Vulpes vulpes*	LC

Fish species recorded during initial surveys for the preparation of the Karot Hydropower Project Biodiversity Management Plan are shown in the table below.

Fish recorded (Biodiversity Management Plan)		
Common name	**Scientific name**	**Conservation status (global)**
Twin-banded loach	*Botia rostrata*	VU
Pakistani bariil	*Barilius pakistanicus*	LC
Vagra bariil	*Barilius vagra*	LC
Indian loach	*Botia lohachata*	LC
Kashmir latia	*Crossocheilus diplochilus*	LC
Clown catfish	*Gagata cenia*	LC
Suckerhead	*Garra gotyla*	LC
Naziri catfish	*Glyptothorax naziri*	NT
Bhed catfish	*Glyptothorax stocki*	EN
Rohu	*Labeo rohita*	LC
Marbled spiny eel	*Mastacembelus armatus*	LC
Rosy barb	*Puntius conchonius*	LC
Pool barb	*Puntius sophore*	LC
Ticto barb	*Puntius ticto*	LC
Flathead catfish	*Pylodictis olivaris*	LC
Stone loach	*Schistura alepidota*	LC
Nalbant's loach	*Schistura nalbanti*	NE
Hillstream loach	*Schistura punjabensis*	NE
Alwan snow trout	*Schizothorax richardsonii*	VU
Mahseer	*Tor putitora*	EN

Source: Hagler Bailly Pakistan 2017.

Endorsement/Approval

Management Plan of Murree Kahuta Kotli Sattian National Park

Prepared by IUCN as the Implementation Organization of

Karot Biodiversity Management Plan

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