

**ISLAMIC REPUBLIC OF PAKISTAN
NATIONAL HIGHWAY AUTHORITY**



ASIAN INFRASTRUCTURE INVESTMENT BANK (AIIB)

**Reconstruction of National Highway N-5 under
Pakistan's Resilient Recovery,
Rehabilitation and Reconstruction Framework
Project**

Phase I-A (141 KM)

Section-7: Rawalpindi-Hassanabdal Road (40 KM)

**National Highway Authority
(IOCT/N-5/PHASE I-A/Section-7)**

TENDER DOCUMENT

JANUARY 2026

(Volume-I)

PROCUREMENT OF WORKS

Single Stage-Two Envelope Tendering Procedure

PROCUREMENT OF WORKS

Tender Document for Procurement of

IOCT/N-5/PHASE I-A/Section-7:

Reconstruction of National Highway N-5 under Pakistan's Resilient Recovery, Rehabilitation and Reconstruction Framework Project, Phase I-A (141 KM)

➤ **Section-7: Rawalpindi-Hassanabdal Road (40 KM)**

Issued on:

**Invitation for Tenders
No.:**

IOCT/N-5/PHASE I-A/Section-7

IOCT No.:

IOCT/N-5/PHASE I-A/Section-7

Employer:

National Highway Authority

Country:

Pakistan

Preface

This Tender Document for Procurement of Works has been prepared by National Highway Authority and is based on the Standard Procurement Document (SPD) of the Asian Infrastructure Investment Bank (AIIB or the Bank) for the procurement of works through International Open Competitive Tendering procedures (two-envelope tendering process without prequalification) in compliance with the Bank's Directive on Procurement Instructions for Recipients, for projects that are financed in whole or in part by the Bank.

Table of Contents

PART I Tendering Procedures

Section 1 – Instructions to Tenderers (ITT)	1
Section 2 – Tender Data Sheet (TDS)	41
Section 3 – Evaluation and Qualification Criteria (EQC)	50
Section 4 – Tender Forms (TDF)	67
Section 5 – Eligible Countries (ELC)	150
Section 6 – Prohibited Practices.....	151

PART II Requirements

Section 7 – Works’ Requirements (WRQ)	153
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PART III Conditions of Contract and Contract Forms

Section 8 – General Conditions of Contract (GCC)	345
Section 9 – Particular Conditions of Contract (PCC)	346
Section 10 – Contract Forms (COF)	389

Section 1: Instructions to Tenderers

Table of Contents

A. General	3
1. Scope of Tender	3
2. Source of Funds	3
3. Prohibited Practices.....	4
4. Eligible Tenderers.....	4
5. Eligible Materials, Equipment and Services	8
B. Contents of Tender Document	8
6. Sections of Tender Document	8
7. Clarification of Tender Document, Site Visit, Pre-Tender Meeting	9
8. Amendment of Tender Document.....	11
C. Preparation of Tenders	11
9. Cost of Tendering	11
10. Language of Tender	12
11. Documents Comprising the Tender	12
12. Letter of Tender and Schedules.....	13
13. Alternative Tenders	14
14. Tender Prices and Discounts.....	14
15. Currencies of Tender and Payment	16
16. Documents Comprising the Technical Proposal	16
17. Documents Establishing the Eligibility and Qualifications of the Tenderer	16
18. Period of Validity of Tenders.....	17
19. Tender Security	17
20. Format and Signing of Tender	19
D. Submission of Tenders	24
21. Sealing and Marking of Tenders	20
22. Deadline for Submission of Tenders	21
23. Late Tenders	21
24. Withdrawal, Substitution and Modification of Tenders.....	22

E. Public Opening of Technical Parts of Tenders	23
25. Technical Part Opening	23
F. Evaluation of Tenders – General Provisions	25
26. Confidentiality	25
27. Clarification of Tenders.....	25
28. Deviations, Reservations and Omissions.....	26
29. Nonmaterial Nonconformities.....	26
G. Evaluation of Technical Parts of Tenders.....	27
30. Evaluation of Technical Parts	27
31. Determination of Responsiveness	27
32. Qualification of the Tenderers.....	28
33. Subcontractors	29
H. Public Opening of Financial Parts of Tenders.....	29
34. Public Opening of Financial Parts.....	29
I. Evaluation of Financial Parts of Tenders	32
35. Evaluation of Financial Parts	32
36. Correction of Arithmetical Errors.....	33
37. Conversion to Single Currency	33
38. Provision for Development of Domestic Industry.....	33
39. Comparison of Tenders	33
40. Abnormally Low-Priced Tenders.....	34
41. Unbalanced or Front-Loaded Tenders.....	35
42. Most Advantageous Tender.....	36
43. Employer’s Right to Accept Any Tender, and to Reject Any or All Tenders.....	36
44. Standstill Period.....	36
45. Notification of Intention to Award	36
J. Award of Contract.....	37
46. Award Criteria.....	37
47. Notification of Award.....	37
48. Debriefing by the Employer	38
49. Signing of Contract.....	39
50. Performance Security	39
51. Procurement-Related Complaint.....	40

A. General

1. Scope of Tender

1.1 In connection with the Specific Procurement Notice (SPN) indicated **in the Tender Data Sheet (TDS)**, the Employer, as **specified in the TDS**, issues this Tender Document for the provision of Works as specified in Section VII, Works' Requirements. The name, identification and number of lots (contracts) of this tender are **specified in the TDS**.

1.2 Throughout this Tender Document:

- (a) The term "in writing" means communicated in written form (e.g., by mail, e-mail, fax, including, if specified in the **TDS**, distributed or received through electronic procurement system used by the Employer) with proof of receipt.
- (b) If the context so requires, "singular" means "plural" and vice versa.
- (c) "Day" means calendar day, unless otherwise specified as a "Business Day." A Business Day is any day that is a working day of the Recipient. It excludes the Recipient's official public holidays.
- (d) "ESHS" means environmental, social, health and safety.
- (e) The word "tender" is synonymous with "bid" and "tenderer" with "bidder", and the words "tender documents" with "bidding documents".

2. Source of Funds

2.1 The Recipient **specified in the TDS** has received or has applied for financing (hereinafter called "funds") from the Asian Infrastructure Investment Bank (hereinafter called ("AIIB" or "the Bank") in an amount specified in the **TDS**, toward the project named in the **TDS**. The Recipient intends to apply a portion of the funds to eligible payments under the contract(s) for which this Tender Document is issued.

2.2 Payment by the Bank will be made only at the request of the Recipient and upon approval by the Bank, and will be subject, in all respects, to the terms and conditions of the Loan (or other financing) Agreement. The Loan (or other financing) Agreement prohibits a withdrawal from the loan account for the purpose of any payment to persons or entities, or for any import of goods, equipment, plant or materials, if such payment or import is prohibited by a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations. No party other than the Recipient shall derive any rights from the Loan (or other financing) Agreement or have any claim to the proceeds of the Loan (or other financing).

3. Prohibited Practices

3.1 The Bank requires compliance with the Bank's Policy on Prohibited Practices as set forth in Section VI.

3.2 In further pursuance of this policy, Tenderers shall permit and shall cause their agents (whether declared or not), subcontractors, subconsultants, service providers, suppliers and their personnel, to permit the Bank to inspect all accounts, records and other documents relating to any prequalification process, tender submission, proposal submission and contract performance (in the case of award), and to have them audited by auditors appointed by the Bank.

4. Eligible Tenderers

4.1 A Tenderer may be a firm that is a private entity, a state-owned enterprise or institution subject to ITT 4.6 or any combination of such entities in the form of a Joint Venture (JV) under an existing agreement or with the intent to enter into such an agreement supported by a letter of intent. In the case of a joint venture, all members shall be jointly and severally liable for the execution of the entire Contract in accordance with the Contract terms. The JV shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the members of the JV during the Tendering process and, in the event the JV is awarded the Contract, during contract

execution. Unless specified in the **TDS**, there is no limit on the number of members in a JV.

4.2 A Tenderer shall not have a conflict of interest. Any Tenderer found to have a conflict of interest shall be disqualified. A Tenderer may be considered to have a conflict of interest for the purpose of this Tendering process, if the Tenderer:

- (a) directly or indirectly controls, is controlled by or is under common control with another Tenderer; or
- (b) receives or has received any direct or indirect subsidy from another Tenderer; or
- (c) has the same legal representative as another Tenderer; or
- (d) has a relationship with another Tenderer, directly or through common third parties, that puts it in a position to influence the Tender of another Tenderer, or influence the decisions of the Employer regarding this Tendering process; or
- (e) or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the Works that are the subject of the Tender; or
- (f) or any of its affiliates has been hired (or is proposed to be hired) by the Employer or Recipient as Engineer for the Contract implementation; or
- (g) would be providing goods, works or non-consulting services resulting from or directly related to consulting services for the preparation or implementation of the project specified in the TDS ITT 2.1 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
- (h) has a close business or family relationship with a professional staff of the Recipient (or of the Employer, or of any other beneficiary

of the Bank's financing, or of any other party representing or acting on behalf of the Recipient) who: (i) are directly or indirectly involved in the preparation of the Tender Document or specification of the Contract, and/or the Tender 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 Bank throughout the Tendering process and execution of the Contract; or

- (i) is an affiliate of the Recipient, or of a procurement agent engaged by the Recipient, unless the Recipient demonstrates to the satisfaction of the Bank that there is no significant degree of common ownership, influence or control between the Recipient and/or the Recipient's procurement agent on one hand and the affiliate on the other.

4.3 A firm that is a Tenderer (either individually or as a JV member) shall not participate in more than one Tender, except for permitted alternative Tenders. Such participation shall result in the disqualification of all Tenders in which the firm is involved. However, this does not limit: (a) the inclusion of the same Subcontractor in more than one Tender for the same contract; or (b) the ability of one Tenderer to be a Subcontractor in another Tender for the same contract, if permitted in the **TDS**.

4.4 A Tenderer may have the nationality of any country, subject to the restrictions pursuant to ITT 4.8. A Tenderer shall be deemed to have the nationality of a country if the Tenderer is constituted, incorporated or registered in and operates in conformity with the provisions of the laws of that country, as evidenced by its articles of incorporation (or equivalent documents of constitution or association) and its registration documents, as the case may be. This criterion

also shall apply to the determination of the nationality of proposed subcontractors or subconsultants for any part of the Contract including related Services.

- 4.5 A Tenderer that has been declared, and remains, as at the relevant date, ineligible pursuant to the Bank's Policy on Prohibited Practices as described in Section VI, shall be ineligible to be prequalified for, tender for, propose for, or be awarded a Bank-financed contract or benefit from a Bank-financed contract, financially or otherwise, during such period of time as the Bank shall have determined. The list of debarred firms and individuals is available at the electronic address specified in the **TDS**.
- 4.6 Tenderers that are state-owned enterprises or institutions in the Employer's Country may be eligible to compete and be awarded a Contract(s) only if they can establish, in a manner acceptable to the Bank, that they (i) are carrying out or are established for a business purpose, and are operating on a commercial basis; (ii) are financially and managerially autonomous; (iii) are not controlled by the government on day-to-day management; and (iv) are not under the supervision of the Employer or its procuring agency.
- 4.7 A Tenderer shall not be under suspension from Tendering by the Employer as the result of the operation of a Tender-Securing or Proposal-Securing Declaration.
- 4.8 Firms and individuals may be ineligible if so indicated in Section V and (a) as a matter of law or official regulations, the Recipient's country prohibits commercial relations with the firm or individual's country, provided that the Bank is satisfied that such exclusion does not preclude effective competition for the supply of goods or the contracting of works or services required; or (b) 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 Recipient's country prohibits any import of

goods or contracting of works or services from the firm or individual's country, or any payments to any country, person or entity in that country. When the Works are implemented across jurisdictional boundaries (and more than one country is a Recipient, and is involved in the procurement), then exclusion of a firm or individual on the basis of ITT 4.8 (a) above by any country may be applied to that procurement across other countries involved, if the Bank and the Recipients involved in the procurement agree.

4.9 A Tenderer shall provide such documentary evidence of eligibility satisfactory to the Employer, as the Employer shall reasonably request.

4.10 A firm that is under a sanction of debarment by the Recipient from being awarded a contract is eligible to participate in this procurement, unless the Bank, at the Recipient's request, is satisfied that the debarment (a) relates to fraud or corruption or other prohibited practices, and (b) followed a judicial or administrative proceeding that afforded the firm adequate due process.

5. Eligible Materials, Equipment and Services

5.1 The materials, equipment and services to be supplied under the Contract and financed by the Bank may have their origin in any country subject to the restrictions specified in Section V, Eligible Countries, and all expenditures under the Contract will not contravene such restrictions. At the Employer's request, Tenderers may be required to provide evidence of the origin of materials, equipment and services.

B. Contents of Tender Document

6. Sections of Tender Document

6.1 The Tender Document consists of Parts 1, 2 and 3, includes all the sections specified below, and should be read in conjunction with any Addenda issued in accordance with ITT 8.

PART 1 Tendering Procedures

- Section I - Instructions to Tenderers (ITT)
- Section II - Tender Data Sheet (TDS)

- Section III - Evaluation and Qualification Criteria
- Section IV - Tender Forms
- Section V - Eligible Countries
- Section VI - Prohibited Practices

PART 2 Works Requirements

- Section VII - Works' Requirements

PART 3 Conditions of Contract and Contract Forms

- Section VIII - General Conditions of Contract (GCC)
- Section IX - Particular Conditions of Contract (PCC)
- Section X - Contract Forms

6.2 The Specific Procurement Notice issued by the Employer is not part of the Tender Document.

6.3 Unless obtained directly from the Employer, the Employer is not responsible for the completeness of the Tender Document, responses to requests for clarification, the minutes of the pre-Tender meeting (if any), or Addenda to the Tender Document in accordance with ITT 8. In case of any contradiction, documents obtained directly from the Employer shall prevail.

6.4 The Tenderer is expected to examine all instructions, forms, terms and specifications in the Tender Document and to furnish with its Tender all information and documentation as is required by the Tender Document.

7. Clarification of Tender Document, Site Visit, Pre-Tender Meeting

7.1 A Tenderer requiring any clarification of the Tender Document shall contact the Employer in writing at the Employer's address **specified in the TDS** or raise its enquiries during the pre-Tender meeting if provided for in accordance with ITT 7.4. The Employer will respond in writing to any request for clarification, provided that such request is received no later than fourteen (14) days prior to the deadline for submission of

Tenders. The Employer shall forward copies of its response to all Tenderers who have acquired the Tender Document in accordance with ITT 6.3, including a description of the inquiry but without identifying its source. If so specified in the **TDS**, the Employer shall also promptly publish its response at the web page identified in the **TDS**. Should the clarification result in changes to the essential elements of the Tender Document, the Employer shall amend the Tender Document following the procedure under ITT 8 and ITT 22.2.

- 7.2 The Tenderer is advised to visit and examine the Site of Works and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the Tender and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Tenderer's own expense.
- 7.3 The Tenderer and any of its personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the Tenderer, its personnel and agents will release and indemnify the Employer and its 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 the inspection.
- 7.4 If so specified in the **TDS**, the Tenderer's designated representative is invited to attend a pre-Tender meeting and/or a Site of Works visit. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.
- 7.5 The Tenderer is requested to submit any questions in writing, to reach the Employer not later than one week before the meeting.

7.6 Minutes of the pre-Tender meeting, if applicable, including the text of the questions asked by Tenderers, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Tenderers who have acquired the Tender Document in accordance with ITT 6.3. If so specified in the **TDS**, the Employer shall also promptly publish the Minutes of the pre-Tender meeting at the web page identified in the **TDS**. Any modification to the Tender Document that may become necessary as a result of the pre-Tender meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to ITT 8 and not through the minutes of the pre-Tender meeting. Nonattendance at the pre-Tender meeting will not be a cause for disqualification of a Tenderer.

8. Amendment of Tender Document

- 8.1 At any time prior to the deadline for submission of Tenders, the Employer may amend the Tender Document by issuing addenda.
- 8.2 Any addendum issued shall be part of the Tender Document and shall be communicated in writing to all who have obtained the Tender Document from the Employer in accordance with ITT 6.3. The Employer shall also promptly publish the addendum on the Employer's web page in accordance with ITT 7.1.
- 8.3 To give Tenderers reasonable time in which to take an addendum into account in preparing their Tenders, the Employer may, at its discretion, extend the deadline for the submission of Tenders, pursuant to ITT 22.2.

C. Preparation of Tenders

9. Cost of Tendering

- 9.1 The Tenderer shall bear all costs associated with the preparation and submission of its Tender, and the Employer shall not be responsible or liable for those costs, regardless of the conduct or outcome of the Tendering process.

10. Language of Tender

10.1 The Tender, as well as all correspondence and documents relating to the Tender exchanged by the Tenderer and the Employer, shall be written in the language specified in the **TDS**. Supporting documents and printed literature that are part of the Tender may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language specified in the **TDS**, in which case, for purposes of interpretation of the Tender, such translation shall govern.

11. Documents Comprising the Tender

11.1 The Tender shall comprise two Parts, namely the Technical Part and the Financial Part. These two Parts shall be submitted simultaneously in two separate sealed envelopes (two-envelope tendering process). One envelope shall contain only information relating to the Technical Part, and the other only information relating to the Financial Part. These two envelopes shall be enclosed in a separate sealed outer envelope marked "ORIGINAL TENDER."

11.2 The Technical Part shall contain the following:

- (a) **Letter of Tender – Technical Part:** prepared in accordance with ITT 12.
- (b) **Tender Security or Tender-Securing Declaration:** in accordance with ITT 19.1.
- (c) **Alternative Tender – Technical Part:** if permissible, in accordance with ITT 13.
- (d) **Authorization:** written confirmation authorizing the signatory of the Tender to commit the Tenderer, in accordance with ITT 20.3.
- (e) **Eligibility:** documentary evidence in accordance with ITT 17.1 establishing the Tenderer's eligibility to tender.
- (f) **Qualifications:** documentary evidence in accordance with ITT 17.2 establishing the Tenderer's qualifications to perform the Contract if its Tender is accepted.

(g) **Conformity:** a technical proposal in accordance with ITT 16.

(h) Any other document required in the **TDS**.

11.3 The Financial Part shall contain the following:

(a) **Letter of Tender – Financial Part:** prepared in accordance with ITT 12 and ITT 14.

(b) **Bill of Quantities:** completed in accordance with ITT 12 and ITT 14.

(c) **Alternative Tender - Financial Part:** if permissible in accordance with ITT 13; and

(d) Any other document required in the **TDS**.

11.4 The Technical Part shall not include any information related to the Tender price. Where material financial information related to the Tender price is contained in the Technical Part, the Tender shall be declared nonresponsive.

11.5 In addition to the requirements under ITT 11.2, Tenders submitted by a JV shall include a copy of the Joint Venture Agreement entered into by all members. Alternatively, a letter of intent to execute a Joint Venture Agreement in the event of a successful Tender shall be signed by all members and submitted with the Tender, together with a copy of the proposed Agreement.

11.6 The Tenderer shall furnish in the Letter of Tender – Financial Part information on commissions and gratuities, if any, paid or to be paid to agents or any other party relating to this Tender.

12. Letter of Tender and Schedules

12.1 The Letter of Tender – Technical Part, the Letter of Tender – Financial Part and Schedules, including the Bill of Quantities, shall be prepared using the relevant forms furnished in Section IV, Tender Forms. The forms must be completed without any alterations to the text, and no substitutes shall be accepted except as

provided under ITT 20.3. All blank spaces shall be filled in with the information requested.

13. Alternative Tenders

- 13.1 Unless otherwise specified in the **TDS**, alternative Tenders shall not be considered.
- 13.2 When alternative times for completion are explicitly invited, a statement to that effect will be included in the **TDS**, and the method of evaluating different alternative times for completion will be described in Section III, Evaluation and Qualification Criteria.
- 13.3 Except as provided under ITT 13.4 below, Tenderers wishing to offer technical alternatives to the requirements of the Tender Document must first price the Employer's design as described in the Tender Document and shall further provide all information necessary for a complete evaluation of the alternative by the Employer, including drawings, design calculations, technical specifications, breakdown of prices and proposed construction methodology and other relevant details. Only the technical alternatives, if any, of the Tenderer with the Most Advantageous Tender conforming to the basic technical requirements shall be considered by the Employer.
- 13.4 When specified in the **TDS**, Tenderers are permitted to submit alternative technical solutions for specified parts of the Works. Such parts will be identified in the **TDS** and described in Section VII, Works' Requirements. The method for their evaluation will be stipulated in Section III, Evaluation and Qualification Criteria.

14. Tender Prices and Discounts

- 14.1 The prices and discounts (including any price reduction) quoted by the Tenderer in the Letter of Tender and in the Bill of Quantities shall conform to the requirements specified below.
- 14.2 The Tenderer 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 the Tenderer shall be deemed covered by the rates for other items in the Bill of

Quantities and will not be paid for separately by the Employer.

- 14.3 The price to be quoted in the Letter of Tender – Financial Part, in accordance with ITT 12.1, shall be the total price of the Tender, excluding any discounts offered.
- 14.4 The Tenderer shall quote any discounts and the methodology for their application in the Letter of Tender – Financial Part, in accordance with ITT 12.1.
- 14.5 Unless otherwise specified in the **TDS** and the Conditions of Contract, the rates and prices quoted by the Tenderer are subject to adjustment during the performance of the Contract in accordance with the provisions of the Conditions of Contract. In such a case, the Tenderer shall furnish the indices and weightings for the price adjustment formula in the Table of Adjustment Data in Section IV, Tender Forms, and the Employer may require the Tenderer to justify its proposed indices and weightings.
- 14.6 If so specified in ITT 1.1, Tenders are being invited for individual lots (contracts) or for any combination of lots (packages). Tenderers wishing to offer discounts for the award of more than one Contract shall specify in their Tender the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Discounts shall be submitted in accordance with ITT 14.4, provided the Tenders for all lots (contracts) are opened at the same time. If, however, rated criteria are used in accordance with ITT 30.2, discounts on condition of award of more than one Contract shall not be used for Tender evaluation purpose.
- 14.7 All duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause, as of the date twenty-eight (28) days prior to the deadline for submission of Tenders,

shall be included in the rates and prices and the total Tender Price submitted by the Tenderer.

15. Currencies of Tender and Payment

15.1 The currency (ies) of the Tender and the currency (ies) of payments shall be the same and shall be as specified in the **TDS**.

15.2 Tenderers may be required by the Employer to justify, to the Employer's satisfaction, their local and foreign currency requirements, and to substantiate that the amounts included in the unit rates and prices and shown in the Table of Adjustment Data in the Appendix to Tender in Section IV, Tender Forms, are reasonable, in which case a detailed breakdown of the foreign currency requirements shall be provided by Tenderers.

16. Documents Comprising the Technical Proposal

16.1 The Tenderer shall furnish a technical proposal in the Technical Part of the Tender including a statement of work methods, equipment, personnel, schedules and any other information as stipulated in Section IV, Tender Forms, in sufficient detail to demonstrate the adequacy of the Tenderer's proposal to meet the works' requirements and the completion time.

17. Documents Establishing the Eligibility and Qualifications of the Tenderer

17.1 To establish Tenderer's eligibility in accordance with ITT 4, Tenderers shall complete the Letter of Tender – Technical Part, included in Section IV, Tender Forms.

17.2 In accordance with Section III, Evaluation and Qualification Criteria, to establish its qualifications to perform the Contract, the Tenderer shall provide the information requested in the corresponding information sheets included in Section IV, Tender Forms.

17.3 If provisions for development of domestic industry (such as a margin of domestic preference) apply as specified in accordance with ITT 38.1, domestic Tenderers, individually or in joint ventures, applying for eligibility for domestic preference shall supply all information required to satisfy the criteria for eligibility specified in accordance with ITT 38.1.

18. Period of Validity of Tenders

- 18.1. Tenders shall remain valid for the Tender Validity period specified in the **TDS**. The Tender Validity period starts from the date fixed for the Tender submission deadline (as prescribed by the Employer in accordance with ITT 22). A Tender valid for a shorter period shall be rejected by the Employer as nonresponsive.
- 18.2. In exceptional circumstances, prior to the expiration of the Tender validity period, the Employer may request Tenderers to extend the period of validity of their Tenders. The request and the responses shall be made in writing. If a Tender Security is requested in accordance with ITT 19, it shall also be extended for a corresponding period. A Tenderer may refuse the request without forfeiting its Tender security. A Tenderer granting the request shall not be required or permitted to modify its Tender, except as provided in ITT 18.3.
- 18.3. If the award is delayed by a period exceeding fifty-six (56) days beyond the expiry of the initial Tender validity period, the Contract price shall be determined as follows:
 - (a) in the case of fixed price contracts, the Contract price shall be the Tender price adjusted by the factor specified in the **TDS**;
 - (b) in the case of adjustable price contracts, no adjustment shall be made; or
 - (c) in any case, Tender evaluation shall be based on the Tender price without taking into consideration the applicable correction from those indicated above.

19. Tender Security

- 19.1 The Tenderer shall furnish as part of the Technical Part of its Tender, either a Tender Security or a Tender-Securing Declaration, as specified in the **TDS**, in original form and, in the case of a Tender Security, in the amount and currency, or in the case of a Tender-Securing Declaration, for the period of ineligibility, as **specified in the TDS**.

- 19.2 A Tender-Securing Declaration shall use the form included in Section IV, Tender Forms.
- 19.3 If a Tender Security is specified pursuant to ITT 19.1, the Tender Security shall be a demand guarantee in any of the following forms at the Tenderer's option:
- (a) an unconditional guarantee issued by a bank,
 - (b) an irrevocable letter of credit,
 - (c) a cashier's or certified check or
 - (d) another security specified in the **TDS**,
- from a reputable source from an eligible country. In the case of a bank guarantee, the Tender Security shall be submitted either using the Tender Security Form included in Section IV, Tender Forms, or in another substantially similar format approved by the Employer prior to Tender submission. The Tender Security shall be valid for twenty-eight (28) days beyond the original validity period of the Tender, or beyond any period of extension if requested under ITT 18.2.
- 19.4 If a Tender Security or Tender-Securing Declaration is specified pursuant to ITT 19.1, any Tender not accompanied by a substantially responsive Tender Security or Tender-Securing Declaration shall be rejected by the Employer as nonresponsive.
- 19.5 If a Tender Security is specified pursuant to ITT 19.1, the Tender Security of unsuccessful Tenderers shall be returned as promptly as possible upon the successful Tenderer's signing the Contract and furnishing the Performance Security pursuant to ITT 49.
- 19.6 The Tender Security of the successful Tenderer shall be returned as promptly as possible once the successful Tenderer has signed the Contract and furnished the required Performance Security.

19.7 The Tender Security may be forfeited, or the Tender-Securing Declaration executed:

(a) if a Tenderer withdraws its Tender during the period of Tender validity specified by the Tenderer on the Letter of Tender, or any extension thereto provided by the Tenderer; or

(b) if the successful Tenderer fails to:

(i) sign the Contract in accordance with ITT 48; or

(ii) furnish a Performance Security in accordance with ITT 49.

19.8 The Tender Security or the Tender-Securing Declaration of a JV shall be in the name of the JV that submits the Tender. If the JV has not been legally constituted into a legally enforceable JV at the time of Tendering, the Tender Security or the Tender-Securing Declaration shall be in the names of all future members as named in the letter of intent referred to in ITT 4.1 and ITT 11.5.

20. Format and Signing of Tender

20.1 The Tenderer shall prepare one original set of the Technical Part of the Tender and one original set of the Financial Part of the Tender as described in ITT 11 and ITT 21, and clearly mark them "ORIGINAL." Alternative Tenders, if permitted in accordance with ITT 13, shall be clearly marked "ALTERNATIVE." In addition, the Tenderer shall submit copies of the Tender, in the number **specified in the TDS** and clearly mark them "COPY." In the event of any discrepancy between the original and the copies, the original shall prevail.

20.2 Tenderers shall mark as "CONFIDENTIAL" all information in their Tenders which is confidential to their business. This may include proprietary information, trade secrets or commercial or financially sensitive information.

20.3 The original and all copies of the Tender shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Tenderer. This authorization shall

consist of a written confirmation as specified in the **TDS** and shall be attached to the Tender. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Tender where entries or amendments have been made shall be signed or initialed by the person signing the Tender.

- 20.4 In case the Tenderer is a JV, the Tender shall be signed by an authorized representative of the JV on behalf of the JV, and so as to be legally binding on all the members as evidenced by a power of attorney signed by their legally authorized representatives.
- 20.5 Any amendments such as interlineation, erasures or overwriting shall be valid only if they are signed or initialed by the person signing the Tender.

D. Submission of Tenders

21. Sealing and Marking of Tenders

- 21.1 Tenderers may submit their Tenders by mail or by hand. If so specified in the **TDS**, Tenderers shall have the option of submitting their Tenders electronically. Procedures for submission, sealing and marking are as follows:
- 21.2 Tenderers submitting Tenders by mail or by hand shall enclose the original Technical Part of the Tender, the original Financial Part of the Tender and the respective copies of the Tender, including Alternative Tenders if permitted in accordance with ITT 13, in separate sealed envelopes. The envelopes shall be duly marked as "ORIGINAL-TECHNICAL PART," "ORIGINAL-FINANCIAL PART," "COPY-TECHNICAL PART," "COPY-FINANCIAL PART," "ALTERNATIVE-ORIGINAL-TECHNICAL PART," "ALTERNATIVE-ORIGINAL-FINANCIAL PART," "ALTERNATIVE-COPY-TECHNICAL PART" and "ALTERNATIVE-COPY-FINANCIAL PART". These envelopes shall then be enclosed in one single package. The rest of the procedure

shall be in accordance with ITT 21.2 through ITT 21.5.

21.3 Tenderers submitting Tenders electronically shall follow the electronic tender submission procedures specified in the **TDS**.

21.4 The inner and outer envelopes shall:

- (a) bear the name and address of the Tenderer;
- (b) be addressed to the Employer in accordance with ITT 22.1; and
- (c) bear the specific identification of this Tendering process specified in accordance with TDS ITT 1.1.

21.5 The outer envelopes and the inner envelopes containing the Technical Part of Tender shall bear a warning not to open before the time and date for the opening of Technical Part of Tender, in accordance with ITT 25.1.

21.6 The inner envelopes containing the Financial Part of Tender shall bear a warning not to open until advised by the Employer in accordance with ITT 34.

21.7 If all envelopes are not sealed and marked as required, the *Employer* will assume no responsibility for the misplacement or premature opening of the Tender.

22. Deadline for Submission of Tenders

22.1 Tenders must be received by the Employer at the address and no later than the date and time **specified in the TDS**.

22.2 The Employer may, at its discretion, extend the deadline for the submission of Tenders by amending the Tender Document in accordance with ITT 8, in which case all rights and obligations of the Employer and Tenderers previously subject to the deadline shall thereafter be subject to the deadline as extended.

23. Late Tenders

23.1 The Employer shall not consider any Tender that arrives after the deadline for submission of Tenders, in accordance with ITT 22. Any Tender

received by the Employer after the deadline for submission of Tenders shall be declared late, rejected, and returned unopened to the Tenderer.

24. Withdrawal, Substitution and Modification of Tenders

24.1 A Tenderer may withdraw, substitute or modify its Tender after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITT 20.3 (except that withdrawal notices do not require copies). The corresponding substitution or modification of the Tender must accompany the respective written notice. All notices must be:

- (a) prepared and submitted in accordance with ITT 20 and ITT 21 (except that withdrawals notices do not require copies), and in addition, the respective envelopes shall be clearly marked "WITHDRAWAL," "SUBSTITUTION" and "MODIFICATION," and
- (b) received by the Employer prior to the deadline prescribed for submission of Tenders, in accordance with ITT 22.

24.2 Tenders requested to be withdrawn in accordance with ITT 24.1 shall be returned unopened to the Tenderers.

24.3 No Tender may be withdrawn, substituted or modified in the interval between the deadline for submission of Tenders and the expiration of the period of Tender validity specified by the Tenderer on the Letter of Tender or any extension thereof.

E. Public Opening of Technical Parts of Tenders

25. Technical Part Opening

- 25.1 Except in the cases specified in ITT 23 and ITT 24.2, the Employer shall publicly open and read out in accordance with this ITT all Tenders received by the deadline, at the date, time and place specified in the **TDS**, in the presence of Tenderers' designated representatives and anyone who chooses to attend. Any specific electronic Tender opening procedures required if electronic Tendering is permitted in accordance with ITT 21.1, shall be as specified in the **TDS**.
- 25.2 First, envelopes marked "WITHDRAWAL" shall be opened and read out and the envelope with the corresponding Tender shall not be opened, but returned to the Tenderer. No Tender withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at Tender opening.
- 25.3 Next, envelopes marked "SUBSTITUTION" shall be opened and read out and exchanged with the corresponding Tender being substituted, and the substituted Tender shall not be opened, but returned to the Tenderer. No Tender substitution shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out at Tender opening.
- 25.4 Next, envelopes marked "MODIFICATION" shall be opened and read out with the corresponding Tender. No Tender modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at Tender opening.
- 25.5 Next, all remaining envelopes marked "TECHNICAL PART" shall be opened one at a time. All envelopes marked "FINANCIAL PART" shall remain sealed and kept by the Employer in

safe custody until they are opened, at a later public opening, following the evaluation of the Technical Part of the Tenders. On opening the envelopes marked “TECHNICAL PART” the Employer shall read out: the name of the Tender, the presence or the absence of a Tender Security or Tender-Securing Declaration, if required, and whether there is a modification; and Alternative Tender - Technical Part; and any other details as the Employer may consider appropriate.

- 25.6 Only Technical Parts of Tenders and Technical Parts of Alternative Tenders that are opened and read out at Tender opening shall be considered further for evaluation. The Letter of Tender – Technical Part and the separate sealed envelopes marked “FINANCIAL PART” are to be initialed by representatives of the Employer attending Tender opening in the manner specified in the **TDS**.
- 25.7 At the tender opening the Employer shall neither discuss the merits of any Tender nor reject any Tender (except for late Tenders, in accordance with ITT 23.1).
- 25.8 The Employer shall prepare a record of the Technical Part of Tender opening that shall include, as a minimum:
- (a) the name of the Tenderer and whether there is a withdrawal, substitution or modification;
 - (b) the receipt of envelopes marked “FINANCIAL PART”;
 - (c) the presence or absence of a Tender Security or Tender-Securing Declaration, if one was required any alternative Tenders; and
 - (d) if applicable, any Alternative Tender – Technical Part.
- 25.9 The Tenderers’ representatives who are present shall be requested to sign the record. The omission of a Tenderer’s signature on the record

shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Tenderers who submitted Tenders in time, and posted online when electronic Tendering is permitted.

F. Evaluation of Tenders – General Provisions

26. Confidentiality

- 26.1 Information relating to the evaluation of Tenders and recommendation of contract award shall not be disclosed to Tenderers or any other persons not officially concerned with the Tendering process until information on Intention to Award the Contract is transmitted to all Tenderers in accordance with ITT 45.
- 26.2 Any attempt by a Tenderer to influence the Employer in the evaluation of the Tenders or Contract award decisions may result in the rejection of its Tender.
- 26.3 Notwithstanding ITT 26.2, from the time of Tender opening to the time of Contract award, if a Tenderer wishes to contact the Employer on any matter related to the Tendering process, it shall do so in writing.

27. Clarification of Tenders

- 27.1 To assist in the examination, evaluation and comparison of the Tenders, and qualification of the Tenderers, the Employer may, at its discretion, ask any Tenderer for a clarification of its Tender, allowing a reasonable time for response. Any clarification submitted by a Tenderer that is not in response to a request by the Employer shall not be considered. The Employer's request for clarification and the response shall be in writing. No change, including any voluntary increase or decrease, in the prices or substance of the Tender shall be sought, offered or permitted, except to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Tenders, in accordance with ITT 36.

28. Deviations, Reservations and Omissions

27.2 If a Tenderer does not provide clarifications of its Tender by the date and time set in the Employer's request for clarification, its Tender may be rejected.

28.1 During the evaluation of Tenders, the following definitions apply:

(a) "Deviation" is a departure from the requirements specified in the Tender Document.

(b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Tender Document.

(c) "Omission" is the failure to submit part or all of the information or documentation required in the Tender Document.

29. Nonmaterial Nonconformities

29.1 Provided that a Tender is substantially responsive, the Employer may waive any nonconformities in the Tender.

29.2 Provided that a Tender is substantially responsive, the Employer may request that the Tenderer submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities or omissions in the Tender related to documentation requirements. Requesting information or documentation on such nonconformities or omissions shall not be related to any aspect of the price of the Tender. Failure of the Tenderer to comply with the request may result in the rejection of its Tender.

29.3 Provided that a Tender is substantially responsive, the Employer shall rectify quantifiable nonmaterial nonconformities related to the Tender Price. To this effect, the Tender Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or nonconforming item or component in the manner specified in the **TDS**.

G. Evaluation of Technical Parts of Tenders

30. Evaluation of Technical Parts

30.1 In evaluating the Technical Parts of each Tender, the Employer shall use the criteria and methodologies listed in this ITT and Section III, Evaluation and Qualification Criteria. No other evaluation criteria or methodologies shall be permitted.

30.2 If specified in the **TDS**, the Employer's evaluation will be carried out by applying rated criteria that take into account technical factors, in addition to cost factors. An Evaluated Tender Score will be calculated for each responsive Tender using the formula specified in Section III, Evaluation and Qualification Criteria. The scores to be given to technical factors and sub-factors are specified in the **TDS**. The weights to be given to the cost and the total technical score are specified in the **TDS**.

31. Determination of Responsiveness

31.1 The Employer's determination of a Tender's responsiveness is to be based on the contents of the Tender itself, as defined in ITT 11.

31.2 A substantially responsive Tender is one that meets the requirements of the Tender Document without material deviation, reservation or omission. A material deviation, reservation or omission is one that:

(a) if accepted, would:

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

(ii) limit in any substantial way, inconsistent with the Tender Document, the Employer's rights or the Tenderer's

obligations under the proposed Contract;
or

(b) if rectified, would unfairly affect the competitive position of other Tenderers presenting substantially responsive Tenders.

31.3 The Employer shall examine the technical aspects of the Tender submitted in accordance with ITT 16, in particular, to confirm that all requirements of Section VII, Works' Requirements have been met without any material deviation, reservation or omission.

31.4 If a Tender is not substantially responsive to the requirements of the Tender Document, it shall be rejected by the *Employer* and may not subsequently be made responsive by correction of the material deviation, reservation or omission.

32. Qualification of the Tenderers

32.1 The Employer shall determine to its satisfaction whether the eligible Tenderers that have submitted substantially responsive Tender - Technical Parts meet the qualifying criteria specified in Section III, Evaluation and Qualification Criteria.

32.2 The determination shall be based upon an examination of the documentary evidence of the Tenderer's qualifications submitted by the Tenderer, pursuant to ITT 17. The determination shall not take into consideration the qualifications of other firms such as the Tenderer's subsidiaries, parent entities, affiliates, subcontractors (other than Specialized Subcontractors if permitted in ITT 33.3) or any other firm(s) different from the Tenderer.

32.3 If a Tenderer does not meet the qualifying criteria specified in Section III, Evaluation and Qualification Criteria, its Tender shall be rejected by the Employer and may not subsequently be made responsive by correction of the material deviation, reservation or omission.

32.4 Only Tenders that are both substantially responsive to the Tender Document and meet all Qualification Criteria shall have their envelopes marked “FINANCIAL PART” opened at the second public opening.

33. Subcontractors

33.1 Unless otherwise stated in the **TDS**, the Employer does not intend to execute any specific elements of the Works by subcontractors selected in advance by the Employer.

33.2 Tenderers may propose subcontracting up to the percentage of total value of contracts or the volume of works as specified in the **TDS**. Subcontractors proposed by the Tenderer shall be fully qualified for their parts of the Works.

33.3 The subcontractor’s qualifications shall not be used by the Tenderer to qualify for the Works unless their specialized parts of the Works were previously designated by the Employer in the **TDS** as can be met by subcontractors referred to hereafter as ‘Specialized Subcontractors,’ in which case, the qualifications of the Specialized Subcontractors proposed by the Tenderer may be added to the qualifications of the Tenderer.

H. Public Opening of Financial Parts of Tenders

34. Public Opening of Financial Parts

34.1 Following the completion of the evaluation of the Technical Parts of the Tenders, and the Bank has issued its no objection (if applicable), the Employer shall notify in writing those Tenderers whose Tenders were considered nonresponsive to the Tender Document or failed to meet the Qualification Criteria, advising them of the following information:

(a) the grounds on which their Technical Part of Tender failed to meet the requirements of the Tender Document;

(b) their envelopes marked “FINANCIAL PART” will be returned to them unopened after the

completion of the selection process and the signing of the Contract; and

(c) notify them of the date, time and location of the public opening of the envelopes marked "FINANCIAL PART."

34.2 The Employer shall, simultaneously, notify in writing those Tenderers whose Tenders - Technical Parts have been evaluated as substantially responsive to the Tender Document and met all Qualifying Criteria, advising them of the following information:

(a) the name of each Tenderer whose Tender has been evaluated as substantially responsive to the Tender Document and met the Qualification Criteria;

(b) when rated criteria are used, the evaluated technical score of each Tenderer;

(c) their envelope marked "FINANCIAL PART" will be opened at the public opening of the Financial Parts; and

(d) notify them of the date, time and location of the second public opening of the envelopes marked "FINANCIAL PART" as specified in the **TDS**.

34.3 The opening date should allow Tenderers sufficient time to make arrangements for attending the opening. The Financial Part of the Tender shall be opened publicly in the presence of Tenderers' designated representatives and anyone who chooses to attend.

34.4 At this public opening the Financial Parts of the Tenderers who met the Qualification Criteria and whose Technical Parts were evaluated as substantially responsive will be opened by the Employer in the presence of Tenderers, or their designated representatives and anyone else who chooses to attend. When rated criteria are used, the names of the Tenderers and their technical scores shall be read out. Then each of the envelopes marked "FINANCIAL PART" shall

be inspected to confirm that they have remained sealed and unopened. These envelopes shall then be opened by the Employer. The Employer shall read out the names of each Tenderer, and the total Tender prices, per lot (contract) if applicable, including any discounts and Alternative Tender - Financial Part, and any other details as the Employer may consider appropriate.

- 34.5 Only envelopes of Financial Part of Tenders, Financial Parts of Alternative Tenders and discounts that are opened and read out at tender opening shall be considered further for evaluation. The Letter of Tender – Financial Part and the Priced Bill of Quantities are to be initialed by representatives of the Employer attending the tender opening in the manner specified in the **TDS**.
- 34.6 The Employer shall neither discuss the merits of any Tender nor reject any envelopes marked “FINANCIAL PART”.
- 34.7 The Employer shall prepare a record of the Financial Part of the Tender opening that shall include, as a minimum:
 - (a) the name of the Tenderer whose Financial Part was opened;
 - (b) the Tender price, per lot (contract) if applicable, including any discounts; and
 - (c) if applicable, any Alternative Tender – Financial Part.
- 1.8 The Tenderers whose envelopes marked “FINANCIAL PART” have been opened or their representatives who are present shall be requested to sign the record. The omission of a Tenderer’s signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Tenderers.

I. Evaluation of Financial Parts of Tenders

35. Evaluation of Financial Parts

- 35.1 To evaluate the Financial Part, the Employer shall consider the following:
- (a) the Tender price, excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill of Quantities for admeasurement contracts, but including Daywork items, where priced competitively;
 - (b) price adjustment for correction of arithmetic errors in accordance with ITT 36.1;
 - (c) price adjustment due to discounts offered in accordance with ITT 14.4;
 - (d) converting the amount resulting from applying (a) to (c) above, if relevant, to a single currency in accordance with ITT 37;
 - (e) price adjustment due to quantifiable nonmaterial nonconformities in accordance with ITT 29.3; and
 - (f) the additional evaluation factors are specified in the **TDS** and Section III, Evaluation and Qualification Criteria.
- 35.2 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 Tender evaluation.
- 35.3 If this Tender Document allows Tenderers to quote separate prices for different lots (contracts), the methodology to determine the lowest evaluated cost of the contract combinations, including any discounts offered in the Letter of Tender – Financial Part, is specified in Section III, Evaluation and Qualification Criteria. If, however, rated criteria are used in accordance with ITT 30.2, discounts on condition of award of more than one contract shall not be used for Tender evaluation purpose.

36. Correction of Arithmetical Errors

36.1 In evaluating the Financial Part of each Tender, the Employer shall correct arithmetical errors on the following basis:

- (a) if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Employer there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected;
- (b) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail, and the total shall be corrected; and
- (c) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

36.2 Tenderers shall be requested to accept correction of arithmetical errors. Failure to accept the correction in accordance with ITT 36.1, shall result in the rejection of the Tender.

37. Conversion to Single Currency

37.1 For evaluation and comparison purposes, the currency(ies) of the Tender shall be converted into a single currency **as specified in the TDS**.

38. Provision for Development of Domestic Industry

38.1 Unless otherwise specified in the **TDS**, provision for development of domestic industry (such as a margin of preference for domestic Tenderers) shall not apply.

39. Comparison of Tenders

39.1 The Employer shall compare the evaluated costs of all substantially responsive Tenders established in accordance with ITT 35.1 to determine the Tender that has the lowest evaluated cost.

40. Abnormally Low-Priced Tenders

- 39.2 If ITT 30.2 is applicable, the Employer shall evaluate the technical score and financial score of each tender and determine the Tender with the highest combined technical and financial score in accordance with TDS ITT 30.2.
- 40.1 An Abnormally Low-Priced Tender is one where the Tender price, in combination with other elements of the Tender, appears so low that it raises material concerns as to the capability of the Tenderer in regard to the Tenderer's ability to perform the Contract for the offered Tender Price.
- 40.2 In the event of identification of a potentially Abnormally Low-Priced Tender, the Employer shall undertake a three-step review process as follows:
- (a) identify abnormally low costs and unit rates by comparing them with the Engineer's estimates, other substantially responsive Tenders, or recently awarded similar contracts;
 - (b) clarify and analyze the Tenderer's resource inputs and pricing, including overheads, contingencies and profit margins; and
 - (c) decide whether to accept or reject the Tender.
- 40.3 With regard to ITT 40.2 (b) above, the Employer will seek a written clarification from the Tenderer of the reasons for the offered Tender Price, including a detailed analysis of costs and unit prices, by reference to the scope, proposed methodology, schedule, and allocation of risks and responsibilities. This may also include information regarding the economy of the manufacturing process; the services to be provided, or the construction method to be used; the technical solutions to be adopted; and any exceptionally favorable conditions available to the Tenderer for the works, equipment or services proposed.
- 40.4 After examining the clarifications given and the detailed price analyses presented by the Tenderer, the Employer may as appropriate:

- (a) accept the Tender, if the evidence provided satisfactorily accounts for the low tender price, in which case the Tender is not considered abnormally low; or
- (b) accept the Tender, but require that the amount of the Performance Security be increased at the expense of the Tenderer to a level sufficient to protect the Employer against financial loss. The amount of the Performance Security shall generally be not more than 20 percent of the Contract Price. In such a case, the Employer shall seek written confirmation from the Tenderer during Tender evaluation. If the Tenderer does not accept the increase of the amount of the Performance Security, its Tender shall be rejected; or
- (c) reject the Tender, if the evidence provided does not satisfactorily account for the low tender price, and make a similar determination for the next-ranked Tender, if required.

41. Unbalanced or Front-Loaded Tenders

41.1 If the Tender that is evaluated as the Most Advantageous Tender is, in the Employer's opinion, seriously unbalanced or front loaded, the Employer may require the Tenderer to provide written clarifications. Clarifications may include detailed price analyses to demonstrate the consistency of the Tender prices with the scope of works, proposed methodology, schedule and any other requirements of the Tender Document.

41.2 After the evaluation of the information and detailed price analyses presented by the Tenderer, the Employer may as appropriate:

- (a) accept the Tender; or
- (b) accept the Tender, but require that the total amount of the Performance Security be increased at the expense of the Tenderer to a level not exceeding 20 percent of the Contract Price; or
- (c) reject the Tender, and make a similar determination for the next-ranked Tender.

42. Most Advantageous Tender

42.1 The Employer shall determine the Most Advantageous Tender. The Most Advantageous Tender is the Tender of the Tenderer that meets the Qualification Criteria and whose Tender has been determined to be substantially responsive to the Tender Documents and:

(a) when rated criteria are used, is the tender with the highest combined technical and financial score; or

(b) when rated criteria are not used, is the tender with the lowest evaluated cost.

43. Employer's Right to Accept Any Tender, and to Reject Any or All Tenders

43.1 The Employer reserves the right to accept or reject any Tender and to annul the Tendering process and reject all Tenders at any time prior to Contract Award, without thereby incurring any liability to Tenderers. In case of annulment, all Tenders submitted and specifically, Tender securities, shall be promptly returned to the Tenderers.

44. Standstill Period

44.1 The Contract shall not be awarded earlier than the expiry of the Standstill Period. The Standstill Period shall be ten (10) Business Days unless extended in accordance with ITT 48. The Standstill Period commences the day after the date the Employer has transmitted to each Tenderer the Notification of Intention to Award the Contract. Where only one Tender is submitted, or if this contract is in response to an emergency situation recognized by the Bank, the Standstill Period shall not apply.

45. Notification of Intention to Award

45.1 The Employer shall send to each Tenderer the Notification of Intention to Award the Contract to the successful Tenderer. The Notification of Intention to Award shall contain, at a minimum, the following information:

(a) the name and address of the Tenderer submitting the successful Tender;

(b) the Contract price of the successful Tender;

(c) the names of all Tenderers who submitted Tenders, and their Tender prices as

readout, and as evaluated, and when rated criteria are used, the evaluated technical and financial scores, and the combined total scores;

- (d) a statement of the reason(s) the Tender (of the unsuccessful Tenderer to whom the notification is addressed) was unsuccessful, unless the price or score information in (c) above already reveals the reason;
- (e) the expiry date of the Standstill Period; and
- (f) instructions on how to request a debriefing and/or submit a complaint during the Standstill Period.

J. Award of Contract

46. Award Criteria

46.1 Subject to ITT 43, the Employer shall award the Contract to the successful Tenderer. This is the Tenderer whose Tender has been determined to be the Most Advantageous Tender.

47. Notification of Award

47.1 Prior to the expiry of the Tender Validity Period and upon expiry of the Standstill Period specified in ITT 43.1 or any extension thereof, and, upon satisfactorily addressing any complaint that has been filed within the Standstill Period, the Employer shall notify the successful Tenderer, in writing, that its Tender has been accepted. The notification of award (hereinafter and in the Conditions of Contract and Contract Forms called the "Letter of Acceptance") shall specify the sum that the Employer will pay the Contractor in consideration of the execution of the Contract (hereinafter and in the Conditions of Contract and Contract Forms called "the Contract Price").

47.2 Within ten (10) Business Days after the date of transmission of the Letter of Acceptance, the Employer shall publish the Contract Award Notice which shall contain, at a minimum, the following information:

- (a) name and address of the Employer;
- (b) name and reference number of the contract being awarded, and the procurement method used;
- (c) names of all Tenderers that submitted Tenders, and their Tender prices as read out at Tender opening, and as evaluated, and when rated criteria are used, the evaluated tender scores;
- (d) names of all Tenderers whose Tenders were rejected either as nonresponsive or as not meeting qualification criteria, or were not evaluated, with the reasons therefor;
- (e) the name of the successful Tenderer, the final total contract price, the contract duration and a summary of its scope; and
- (f) successful Tenderer's Beneficial Ownership Disclosure Form, if specified in TDS ITT 49.1.

47.3 The Contract Award Notice shall be published on the Employer's website, as indicated in the **TDS**, with free access if available, or in at least one newspaper of national circulation in the Employer's Country, or in the official gazette. The Employer shall also publish the contract award notice in United Nations Development Business online and AIB website.

47.4 Until a formal Contract is prepared and executed, the Letter of Acceptance shall constitute a binding Contract.

48. Debriefing by the Employer

48.1 On receipt of the Employer's Notification of Intention to Award referred to in ITT 44.1, an unsuccessful Tenderer has three (3) Business Days to make a written request to the Employer for a debriefing. The Employer shall provide a debriefing to all unsuccessful Tenderers whose request is received within this deadline.

48.2 Where a request for debriefing is received within the deadline, the Employer shall provide a debriefing within five (5) Business Days, unless

the Employer decides, for justifiable reasons, to provide the debriefing outside this timeframe. In that case, the Standstill Period shall automatically be extended until five (5) Business Days after such debriefing is provided. If more than one debriefing is so delayed, the Standstill Period shall not end earlier than five (5) Business Days after the last debriefing takes place. The Employer shall promptly inform, by the quickest means available, all Tenderers of the extended standstill period.

48.3 Where a request for debriefing is received by the Employer later than the three (3)-Business Day deadline, the Employer should provide the debriefing as soon as practicable, and normally no later than fifteen (15) Business Days from the date of publication of Contract Award Notice. Requests for debriefing received outside the three (3)-day deadline shall not lead to extension of the standstill period.

48.4 Debriefings of unsuccessful Tenderers may be done in writing or verbally. The Tenderer shall bear its own costs of attending such a debriefing meeting.

49. Signing of Contract

49.1 The Employer shall send to the successful Tenderer the Letter of Acceptance including the Contract Agreement, and, if specified in the **TDS**, a request to submit the Beneficial Ownership Disclosure Form providing additional information on its beneficial ownership. The Beneficial Ownership Disclosure Form, if so requested, shall be submitted within eight (8) Business Days of receiving this request.

49.2 The successful Tenderer shall sign, date and return to the Employer, the Contract Agreement within twenty-eight (28) days of its receipt.

50. Performance Security

50.1 Within twenty-eight (28) days of the receipt of the Letter of Acceptance from the Employer, the successful Tenderer shall furnish the Performance Security in accordance with the General Conditions of Contract, subject to ITT 40.4 (b) and ITT 41.2 (b), using for that purpose

the Performance Security Form included in Section X, Contract Forms, or another form acceptable to the Employer.

50.2 Failure of the successful Tenderer to submit the abovementioned Performance Security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Tender Security. In that event, the Employer may award the Contract to the Tenderer offering the next Most Advantageous Tender.

51. Procurement-Related Complaint

51.1 The procedures for making a Procurement-Related Complaint are as specified in the **TDS**.

Section 2: Tender Data Sheet

This section consists of provisions that are specific to each procurement and supplement the information or requirements included in Section 1 (Instructions to Tenderers).

A. General

ITT 1.1	The reference number of the Tenders is: IOCT/N-5/PHASE I-A/Section-7
ITT 1.1	The Employer is: National Highway Authority
ITT 1.1	The name of the open competitive tendering (IOCT) is: Reconstruction of National Highway N-5 under Pakistan’s Resilient Recovery, Rehabilitation and Reconstruction Framework Project – Phase I-A (141 KM) The identification number of the IOCT is: IOCT/N-5/PHASE I-A/Section-7 The number and identification of section comprising this IOCT is: Section-7: Rawalpindi-Hassanabdal Road (40 KM)
ITT 2.1	The Recipient is: Islamic Republic of Pakistan
ITT 2.1	The Bank Loan Amount: USD 320.16 million (for Phase I-A) Bank Name: Asian Infrastructure Investment Bank (AIIB)
ITT 2.1	The name of the Project is: Reconstruction of National Highway N-5 under Pakistan’s Resilient Recovery, Rehabilitation and Reconstruction Framework Project – Phase I-A (141 KM), Section-7: Rawalpindi-Hassanabdal Road (40 KM)
ITT 4.1	Maximum number of members in the JV shall be: three (3)
ITT 4.3	One Tenderer is not permitted to be a Subcontractor in another Tender for the same contract.
ITT 4.5	A list of debarred firms and individuals is available on the Bank’s website: https://www.aiib.org/debarment

B. Contents of Tender Document

ITT 7.1	For <u>clarification purposes</u> only, the Employer’s address is:						
	<table border="1" style="width: 100%;"> <tr> <td style="width: 25%;">Attention:</td> <td>General Manager (P&CA)</td> </tr> <tr> <td>Street address:</td> <td>National Highway Authority 28-Mauve Area, Sector: G-9/1 Islamabad, Pakistan</td> </tr> <tr> <td>Floor / Room number:</td> <td>Committee Room, 2nd Floor, Room No. 223</td> </tr> </table>	Attention:	General Manager (P&CA)	Street address:	National Highway Authority 28-Mauve Area, Sector: G-9/1 Islamabad, Pakistan	Floor / Room number:	Committee Room, 2nd Floor, Room No. 223
Attention:	General Manager (P&CA)						
Street address:	National Highway Authority 28-Mauve Area, Sector: G-9/1 Islamabad, Pakistan						
Floor / Room number:	Committee Room, 2nd Floor, Room No. 223						

	City:	Islamabad
	ZIP code:	44000
	Country:	Islamic Republic of Pakistan
	Telephone:	+92-51-9032727
	Fax No.	+92-51-9260419
	E-mail address:	gmpca.nha@gmail.com & <u>gmpca@nha.gov.pk</u>
ITT 7.4	A Pre-Tender meeting shall take place.	
	Date:	12th March 2026
	Time:	1100 hrs
	Place:	Auditorium, 2nd Floor, <u>Address:</u> National Highway Authority 28-Mauve Area, Sector: G-9/1 Islamabad, Pakistan
	City:	Islamabad
	Country:	Islamic Republic of Pakistan
	A site visit conducted by the Employer will not be organized.	
ITT 7.6	Pre tender Minutes will be uploaded on NHA website i.e. <u>www.nha.gov.pk</u>	

C. Preparation of Tenders

ITT 10.1	<p>The language of the Tender is: English. All correspondence exchange shall be in English language. The same language in which the Documents are written i.e. English, should be used for preparation of Application/ Proposal, however if an applicant provides any supporting documents in language(s) other than English, in such case the accurate and authenticated translation of the documents in English language shall be considered in submitted in the following manner:</p> <ol style="list-style-type: none"> a. Notary certificates (original) as per the law of their country have been provided for each such translated documents. b. Where the Successful Tenderer is either a Foreign Entity or one of the Joint Venture Member is a Foreign Entity, such foreign entity shall be required to submit before signing the Contract. <ol style="list-style-type: none"> i. The translated documents have been duly verified [signed and stamped (in original) and with the written statement of the attester (the authorized officer of the Embassy) that this is a true copy of the documents translated in English duly notarized and is authentic] from the embassy of the Applicant's country of constitution in Pakistan – or – the translated and duly notarized document shall be attested by the Ministry of
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	<p>Foreign Affairs of the country of the Applicant / Documents duly endorsed by Counsellor of the Embassy of Pakistan in that country.</p> <p>ii. Even English language documents related to foreign country have been attested by Embassy/ Foreign office as per procedure given in (i) above.</p> <p>iii. Foreign public documents authenticated by “Apostille Certificates” issued by the designated authority of the member State of “Apostille Convention” will be acceptable without any other requirement of attestation as mentioned in (i) above.</p>
<p>ITT 11.2(h)</p>	<p>The Tenderer shall submit the following additional documents in its technical part of the tender.</p> <p>Valid ISO as well as other relevant ESHS Certifications as part of the tender not limited to.</p> <ul style="list-style-type: none"> • Quality Management Certificate ISO 9001:2015 • Environmental Management Certificate ISO 14001.2015. • Occupational Health and Safety Management Certificate ISO 45001:2018. <p>Code of Conduct for Contractor’s Personnel</p> <p>The Tenderer shall submit its Code of Conduct that will apply to Contractor’s Personnel (as defined in Sub-clause 1.1.17 of the GCC), to include management of and restrictions on personnel’s behavior with respect to host communities, and ensure compliance with its Environmental, Social, Health and Safety (ESHS) obligations under the contract. The Tenderer shall use for this purpose the Code of Conduct form provided in Section IV. No substantial modifications shall be made to this form, except that the Tenderer may introduce additional requirements, including as necessary to take into account specific Contract issues/risks in accordance with Section 7-Works’ Requirements, e.g., risks associated with: labor and working conditions, occupational health and safety, labor influx, spread of communicable diseases, community safety, including use of security personnel, sexual harassment, gender-based violence, sexual exploitation and abuse, illicit behavior and crime and maintaining a safe environment, stakeholder engagement etc.</p> <p>In addition, the Tenderer shall detail how this Code of Conduct will be implemented. This will include: how it will be introduced into conditions of employment/engagement, what training will be provided, how it will be monitored and how the Contractor proposes to deal with any breaches.</p> <p>The Contractor shall be required to implement the agreed Code of Conduct.</p>

	<p>Management Strategies and Implementation Plans (MSIP) to manage the ESHS risks</p> <p>The Tenderer shall submit its Management Strategies and Implementation Plans (MSIP) in line with the requirements of the Project’s environmental and social instruments (namely, the <u>Environmental and Social Impact Assessment Including the Environmental and Social Management Plan, Resettlement Action Plan, Labor Management Plan, Stakeholder Engagement Plan, Gender Action Plan Framework, Environmental and Social Action Plan</u>) to manage the following key Environmental, Social, Health and Safety (ESHS) risks.</p> <ul style="list-style-type: none"> • Labor and working conditions • Occupational health safety • Community safety management plan • Traffic Management Plan to ensure safety of local communities from construction traffic; • Water Resource Protection Plan to prevent contamination of drinking water; • Waste Management (including spoil, asphalt, construction and demolition, etc.); • Impact on flora and fauna (including tree cutting or site clearance as per the provision define in ESIA/ESMP); • Gender-Based Violence (GBV) and Sexual Exploitation and Abuse (SEA) prevention and response action plan, and • Other impacts as identified in ESIA / ESMP and other E&S documents. <p>The Contractor shall be required to submit for approval and subsequently implement, the Contractor’s Environment and Social Management Plan (C-ESMP), Occupational and Community Health and Safety Management Plan (OCHSMP) and other associated plans as recommended in ESIA/ESMP, in accordance with the Particular Conditions of Contract (Part B) Sub-Clause 4.1, that includes the agreed Management Strategies and Implementation Plans described here as well as in approved final ESIA/ESMP, other E&S documents (LMP, SEP, ESAP, RAP, etc.) as well as in NOC/environmental approval issued by the Environmental Protection and Climate Change Department (EP&CCD).</p> <p>A Labor Management Plan (LMP) shall be prepared by the Tenderer to include general as well as specific terms and conditions of employment, regulation of working hours, payment modalities, living conditions of the workers and a Grievance Redress Mechanism for resolution of labor-related conflicts. This LMP shall be in accordance with the approved project LMP as well as other E&S instruments.</p>
<p>ITT 11.3 (d)</p>	<p>The Tenderer shall submit with its Price Bid the following additional documents:</p>

	<ul style="list-style-type: none"> • Unit price analysis for major items of works.
ITT 11.5	<p>The Joint Venture Agreement or a Letter of Intent to execute a Joint Venture Agreement in the event of the successful Tender, shall include the following:</p> <p>(a) All partners shall be jointly and severally liable.</p> <p>(b) The lead partner shall be clearly identified, nominated and designated as the Representative of the Joint Venture.</p> <p>(c) The financial share of each partner shall be clearly stated.</p> <p>(d) Corresponding to the financial share of each Partner, the roles and responsibilities of each partner, including the separate scope or part of the Works (if any) to be carried out by each partner, shall also be specified; and</p> <p>(e) Any other requirements as per the applicable law.</p> <p>In case a Letter of Intent to execute a Joint Venture Agreement is submitted by the successful Tenderer at the time of submission of the Tender, the Tenderer shall be bound to submit a duly executed Joint Venture Agreement to the Employer immediately after the issuance of Letter of Acceptance but not later than 28 days after the issuance of the same. Such Joint Venture Agreement, thus submitted by the successful Tenderer must contain the information postulated above. Failure to comply with this condition may lead to the annulment of the award and forfeiture of the Tender Security. In that event, the Employer may award the Contract to the next lowest evaluated Tenderer whose offer is substantially responsive and is determined by the Employer to be qualified to perform the Contract satisfactorily.</p>
ITT 13.1	Alternative Tenders shall not be permitted.
ITT 13.2	Alternative times for completion shall not be permitted.
ITT 13.4	Alternative technical solutions shall be permitted for the following parts of the Works: Not Applicable
ITT 14.5	The prices quoted by the Tenderer shall be subject to adjustment.
ITT 15.1	a) The unit rates and the prices shall be quoted by the Tenderer in the Bill of Quantities, entirely in Pakistani Rupees, and further referred to as “the local currency.”, which must not be less than 90 % (ninety percent) of the total Tender Price. A Tenderer 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 in the Appendix to Tender - Table C, the percentage(s) of the Tender Price (excluding Provisional Sums), needed by the Tenderer for the payment of

	<p>such foreign currency requirements, limited to USD (United State Dollar) only.</p> <p>b) The rates of exchange to be used by the Tenderer shall be the exchange rate as specified in ITT 37.1, that shall be 28 days prior to the deadline for submission of Tenders, in arriving at the local currency equivalent and the percentage(s) mentioned in (a) above shall be specified by the Tenderer in the Appendix to Tender – Table C, and shall apply for all payments under the Contract so that no exchange risk will be borne by the successful Tenderer.</p>
ITT 18.1	The tender validity period shall be one hundred and eighty-Two (182) days.
ITT 18.3(a)	The Tender price shall be adjusted by the following factor(s): Not Applicable
ITT 19.1	<p>The Tenderer shall furnish a tender security of Rs. 534.9 million or US\$ 1.91 Million equivalents in form of unconditional Bank Guarantee.</p> <p>Any tender not accompanied by an irrevocable and callable Tender-Security shall be rejected by the Employer as nonresponsive. Similarly, If a Tenderer submits a Tender-Security that (i) deviates in form, amount, and/or period of validity or (ii) does not provide sufficient identification of the Bidder (including, without limitation, failure to indicate the name of the Joint Venture or, where the Joint Venture has not yet been constituted, the names of all future Joint Venture Partners), shall cause the rejection of the Tender.</p>
ITT 19.3(d)	<p>Add the following:</p> <p>"In case of Foreign Bank, the guarantee should be counter guaranteed by a scheduled Bank in Pakistan. "</p>
ITT 20.1	<p>In addition to the original Tender, the number of copies is: Two (02).</p> <p>To facilitate evaluation, tenderers are encouraged to submit soft copies (Flash drive/ USB) one each in PDF format with its Technical Bid and Price Bid. The soft copy (Flash drive/ USB) of the Technical Bid shall be enclosed in the envelope containing the hard copy of the Tenderer's Original Technical Bid, and the soft copy (Flash drive/ USB) of the Price Bid shall be enclosed in the envelope containing the hard copy of the Bidder's Original Price Bid. If there is any discrepancy between the data/information in the soft copy (Flash drive/ USB) of the Tenderer's Technical Bid and the hard copy of the Tenderer's Technical Bid and between the price indicated in the hard copy of the Tenderer's Original Price Bid, and in the soft copy (Flash drive/ USB) of the Tenderer's Price Bid, the data and information indicated in the hard copy of the Original Technical Bid and the Original Price Bid shall prevail.</p> <p>In addition to above, soft copy of Financial Bid in "Excel format" shall also be enclosed in the envelope containing the hard copy of the Tenderer's Original Price Bid, to facilitate review and evaluation process.</p>

	Note: Submission of the (Flash drive/ USB) is only for reference and shall not constitute electronic bid submission as stipulated in ITT 25.1 .
ITT 20.3	<p>The written confirmation of authorization to sign on behalf of the Tenderer shall consist of a board resolution or its equivalent, or power of attorney, which should either be:</p> <p>a) notarized, or</p> <p>b) attested to by an appropriate forum (authority) in the Tenderer’s home country, specifying the representative’s authority to sign the Tender on behalf of the Tenderer.</p> <p>If the Tenderer is an intended or existing joint venture, such authorization should be signed by all parties and specify the representative’s authority to sign the Tender on behalf of the intended or existing joint venture.</p> <p>If the joint venture has not yet been formed, such authorization also includes written evidence from all proposed partners of joint venture of their intent to enter into a joint venture in the event of a contract award.</p>

D. Submission of Tenders

ITT 21.1	Tenderers shall not have the option of submitting their Tenders electronically.																
ITT 22.1	<p>For <u>Tender submission purposes</u> only, the Employer’s address is:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Attention:</td> <td>General Manager (P&CA)</td> </tr> <tr> <td>Street address:</td> <td>National Highway Authority 28-Mauve Area, Sector: G-9/1 Islamabad, Pakistan</td> </tr> <tr> <td>Floor / Room number:</td> <td>Auditorium, 2nd Floor</td> </tr> <tr> <td>City:</td> <td>Islamabad</td> </tr> <tr> <td>ZIP code:</td> <td>44000</td> </tr> <tr> <td>Country:</td> <td>Islamic Republic of Pakistan</td> </tr> </table> <p>The deadline for tender submission is:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Date:</td> <td>7th April 2026</td> </tr> <tr> <td>Time:</td> <td>1100 hrs</td> </tr> </table>	Attention:	General Manager (P&CA)	Street address:	National Highway Authority 28-Mauve Area, Sector: G-9/1 Islamabad, Pakistan	Floor / Room number:	Auditorium, 2nd Floor	City:	Islamabad	ZIP code:	44000	Country:	Islamic Republic of Pakistan	Date:	7th April 2026	Time:	1100 hrs
Attention:	General Manager (P&CA)																
Street address:	National Highway Authority 28-Mauve Area, Sector: G-9/1 Islamabad, Pakistan																
Floor / Room number:	Auditorium, 2nd Floor																
City:	Islamabad																
ZIP code:	44000																
Country:	Islamic Republic of Pakistan																
Date:	7th April 2026																
Time:	1100 hrs																

E. Public Opening of Technical Parts of Tenders

ITT 25.1	The opening of the Technical Parts of Tenders shall take place at:	
	Street address:	National Highway Authority 28-Mauve Area, Sector: G-9/1 Islamabad, Pakistan
	Floor / Room number:	Auditorium, 2nd Floor
	City:	Islamabad
	ZIP code:	44000
	Country:	Islamic Republic of Pakistan
	Date:	7th April 2026
	Time:	1130 hrs
ITT 25.1	Electronic tender opening procedure shall be as follows: Not Applicable	
ITT 25.6	All pages of the Letter of Tender – Technical Part and the sealed envelope(s) marked “FINANCIAL PART” shall be initialled by at least three (03) representatives of the Employer conducting Tender opening.	

F. Evaluation of Tenders – General Provisions

ITT 29.3	An item not listed in the priced Bill of Quantities shall be assumed to be not included in the Tender and price adjustment shall be applied. The adjustment shall be based on the average price of the item or component as quoted in other substantially responsive Tenders. If the price of the item or component cannot be derived from the price of other substantially responsive Tenders, the Employer shall use its best estimate.
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G. Evaluation of Technical Parts of Tenders

ITT 30.2	ITT 30.2 Not Applicable.
ITT 33.1	At this time, the Employer does not intend for the contractor to execute any specific elements of the Works by subcontractors selected in advance.
ITT 33.2	Contractor’s proposed subcontracting: Maximum %age of Subcontracting Permitted: Fifteen Percent (15%) of Total Contract Amount. Tenderers planning to subcontract more than 10 percent of total volume of works shall specify, in the Letter of Tender, the activity(ies) or parts of the Works to be subcontracted along with complete details of the subcontractors and their qualification and experience.
ITT 33.3	Not Applicable.

H. Public Opening of Financial Parts of Tenders

ITT 34.2(c)	Following the completion of the evaluation of the Technical Parts of the Tenders, the Employer will notify all Tenderers of the location, date and time of the public opening of Financial Parts.
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	The Employer shall publish a notice of the public opening of the Financial Parts on its website.
ITT 34.5	The Letter of Price Tender and Bill of Quantities shall be initialled by at least three (03) representatives of the Employer attending Tender opening.

H. Evaluation of Financial Parts of Tenders

ITT 35.1(f)	Not Applicable.
ITT 37.1	The currency that shall be used for Tender evaluation and comparison purposes to convert all Tender prices expressed in various currencies into a single currency is: Pak Rupees (PKR) The source of the selling exchange rate shall be: State Bank of Pakistan The date for the selling exchange rate shall be: 28 days prior to the deadline for submission of Tenders.
ITT 38.1	Domestic preference shall not apply.

J. Award of Contract

ITT 47.3	The template for publication of contract award is available on the Bank's website: https://www.aiib.org/en/opportunities/business/project-procurement/download/Template_Contract-Award-Notice_Goods-Works-Non-Consulting-Services.pdf
ITT 49.1	The successful Tenderer shall submit the Beneficial Ownership Disclosure Form
ITT 51.1	The procedures for making a Procurement-Related Complaint are detailed in the Bank's <u>DIRECTIVE on Procurement Instructions for Recipients</u> dated July 26, 2024. If a Tenderer wishes to make a Procurement-Related Complaint, the Tenderer shall submit its complaint following these procedures, in Writing (by the quickest means available, such as by email or fax), to: For the attention: Grievance Redressal Committee Chairman Title / Position: General Manager (Planning) Employer: National Highway Authority 28 Mauve Area, G-9/1, Islamabad, Pakistan Project: IOCT/N-5/PHASE I-A Project Email address: gmplanningnha@gmail.com Fax number: +92-51-9260346

Section 3 - Evaluation and Qualification Criteria

Phase 1-A consists of the following three Sections

- Section-2: Ranipur-Sukkur Road (70KM)
- Section-7: Rawalpindi-Hassanabdal Road (40KM)
- Section-8: Nowshera-Peshawar Road (31KM)

The Employer may initiate the procurement process for the Works for all of the above Sections either in parallel or in a staggered manner. In such cases, any Tenderer who intends to submit Tenders for more than one Section shall be required to collectively satisfy the requirements of Clause 3.3.1 (Financial Capabilities) for two or three Sections, as applicable.

Likewise, a Tenderer participating in more than one Section tender process shall demonstrate that it possesses, or has firm commitments for, the requisite Key Personnel and Equipment on a cumulative basis, sufficient to meet the requirements of two or three Sections, as applicable. The same Key Personnel or Equipment shall not be proposed for more than one Section.

This section contains all the criteria that the Employer shall use to evaluate Tenders and qualify Tenderers. No other factors, methods or criteria shall be used other than specified in this Tender Document. The Tenderer shall provide all the information requested in the forms included in Section 4, Tender Forms.

Wherever a Tenderer is required to state a monetary amount, Tenderers should indicate the USD equivalent using the rate of exchange determined as follows:

- For construction turnover or financial data required for each year - Exchange rate prevailing on the last day of the respective calendar year (in which the amounts for that year are to be converted) was originally established.
- Value of single contract - Exchange rate prevailing on the date of the contract.

Exchange rates shall be taken from the publicly available source identified in the ITT 37.1. Any error in determining the exchange rates in the Tender may be corrected by the Employer.

Contents

1. Evaluation - Technical Part
2. Qualification Evaluation for Multiple Contracts
3. Qualification Criteria
4. Contractor's Representative and Key Personnel
5. Equipment Requirements
6. Evaluation - Financial Part
7. Combined Evaluation.

1. Evaluation – Technical Part

1.1 Assessment of adequacy of Technical Proposal with Requirements

Evaluation of the Tenderer's Technical Proposal will include an assessment of the Tenderer's technical capacity to mobilize key equipment and personnel for the contract consistent with its proposal regarding work methods, scheduling and material sourcing in sufficient detail and fully in accordance with the requirements stipulated in Section 7, Works' Requirements.

Noncompliance with equipment and key personnel requirements described in this Section shall not normally be a ground for tender rejection, and such noncompliance will be subject to clarification during tender evaluation and rectification prior to contract award.

1.2 Alternative Completion Times

If permitted under ITT 13.2, will be evaluated as follows: **Not Applicable**

1.3 Alternative Technical Solutions for Specified Parts of Works

If permitted under ITT 13.4, will be evaluated as follows: **Not Applicable**

1.4 Sustainable Procurement

The Tenderer shall adopt sustainable procurement practices, including selection of suppliers and materials that minimize environmental and social impact, comply with national/provincial labor and environmental laws (as mentioned in E&S instruments), and support resource efficiency. Preference shall be given to locally available, recycled, and low-carbon materials where technically and economically feasible. Tenderer shall ensure E&S due diligence for all activities which might have significant E&S impacts on environment.

1.5 Technical Proposal Scoring Methodology

If ITT 30.2 applies, the technical factors, and sub-factors if any, to be evaluated and the scores to be given to each technical factor and sub-factors are specified in **TDS ITT 30.2. Not Applicable.**

2. Qualification Evaluation for Multiple Contracts

Not Applicable.

3. Qualification Criteria

Pursuant to ITT32.1, the Employer shall assess each Tender against the following Qualification Criteria. Requirements not included in the text below shall not be used in the evaluation of the Tenderer's qualifications.

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
3.1 Eligibility							
3.1.1	Nationality	Nationality in accordance with ITT 4.4.	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Forms ELI – 1.1 and 1.2, with attachments
3.1.2	Conflict of Interest	No conflicts of interest in accordance with ITT 4.2.	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Letter of Tender
3.1.3	Bank Eligibility	Not having been declared ineligible by the Bank, as described in ITT 4.5.	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Letter of Tender
3.1.4	State-Owned Enterprise or Institution of the Recipient country	Meets conditions of ITT 4.6.	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Forms ELI – 1.1 and 1.2, with attachments
3.1.5	United Nations resolution or	Not having been excluded as a result of prohibition in the Recipient's country laws or official regulations against commercial	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Forms ELI – 1.1 and 1.2, with attachments

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
	Recipient's country law	relations with the Tenderer's country, or by an act of compliance with UN Security Council resolution, both in accordance with ITT 4.8 and Section 5.					
3.1.6	Registration with Pakistan Engineering Council (PEC)	Tenderer having origin of Country as Pakistan must have registration with Pakistan Engineering Council under CA category with specialized code Specialization in CE-01 & CE-02 before signing the Contract.	Must meet requirement for entity having origin of Country as Pakistan	N/A	Must meet requirement for each partner having origin of Country as Pakistan	N/A	Evidence of valid PEC registration
3.1.7	Registration with tax authorities in Pakistan	Tenderer having origin of Country as Pakistan must have registration with tax authorities in Pakistan.	Must meet requirement for entity having origin of Country as Pakistan	N/A	Must meet requirement for each partner having origin of Country as Pakistan	N/A	Evidence of active registration with tax authorities

3.2 Historical Contract Non-Performance							
3.2.1	History of Nonperforming Contracts	Non-performance of a contract ¹ did not occur as a result of contractor default since 1st January, 2018 .	Must meet requirement	Must meet requirement	Must meet requirement ²	N/A	Form CON-2
3.2.2	Suspension Based on Execution of Tender-Securing Declaration by the Employer	Not under suspension based on-execution of a Tender/Proposal Securing Declaration pursuant to ITT 4.7.	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Letter of Tender
3.2.3	Pending Litigation	Tenderer's financial position and prospective long-term profitability still sound according to criteria established in 3.3.1 below and assuming that all pending litigation will be	Must meet requirement	N/A	Must meet requirement	N/A	Form CON-2

¹ Non-performance, as decided by the Employer, shall include all works contracts where (a) non-performance was not challenged by the contractor, including through referral to the dispute resolution mechanism under the respective contract, and (b) contracts that were so challenged but fully settled against the contractor. Non-performance shall not include contracts where Employers decision was overruled by the dispute resolution mechanism. Non-performance must be based on all information on fully settled disputes or litigation, i.e., dispute or litigation that has been resolved in accordance with the dispute resolution mechanism under the respective contract and where all appeal instances available to the Tenderer have been exhausted.

² This requirement also applies to contracts executed by the Tenderer as JV member.

		resolved against the Tenderer					
3.2.4	Litigation History	No consistent history of court/arbitral award decisions against the Tenderer ³ since January 1 st , 2018	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Form CON-2
3.2.5	Declaration: Environmental, Social, Health and Safety (ESHS) past performance	Declare any civil works contracts that have been suspended or terminated and/or performance security called by an employer for reasons related to the noncompliance of any environmental, or social, or health, or safety requirements or safeguard in the past five years. ⁴	Must make the declaration. Where there are Specialized Subcontractor/s, the Specialized Subcontractor/s must also make the declaration.	N/A	Must make the declaration. Where there are Specialized Subcontractor/s, the Specialized Subcontractor/s must also make the declaration.	N/A	Form CON-3 ESHS Performance Declaration
3.3 Financial Situation and Performance							
3.3.1	Financial Capabilities	(i) The Tenderer shall demonstrate that its financial resources as defined in Form FIN-3.3.3, less its financial obligations	Must meet requirement	Must meet requirement	Must meet minimum 25% of the requirement.	Must meet 40% of the requirement.	Forms FIN-3.3.1, FIN-3.3.3, FIN-3.3.4, FIN-3.3.5, with attachments

³ The Tenderer shall provide accurate information on the related Tender Form about any litigation or arbitration resulting from works contracts completed or ongoing under its execution over the last five years. A consistent history of awards against the Tenderer or any member of a joint venture may result in failure of the Tender.

⁴ The Employer may use this information to seek further information or clarifications in carrying out its due diligence.

		<p>for the current contract commitments as defined in Form FIN-3.3.4 meet or exceed the total construction cash flow requirements estimated as follows:</p> <table border="1"> <tr> <td>for Section-7</td> <td>4.4576 billion or US\$ 15.92 million</td> </tr> </table>	for Section-7	4.4576 billion or US\$ 15.92 million					
for Section-7	4.4576 billion or US\$ 15.92 million								
		<p>(ii) Submission of audited financial statements or, if not required by the law of the Tenderer's country, other financial statements acceptable to the Employer, for the last (03) years i.e. Financial Year 2022-23, 2023-24 & 2024-25 of the Tenderers which close their accounts on June 30th every year OR Calendar Year 2022, 2023 & 2024 of the Tenderers which close their accounts on 31st December every year or for the latest three years, applicable to demonstrate the current soundness of the Tenderer's financial position As a minimum, the Tenderer's net worth for the last year,</p>	Must meet requirement	N/A	Must meet requirement	N/A			

		calculated as the difference between total assets and total liabilities should be positive .					
3.3.2	Average Annual Construction Turnover	Minimum average annual construction turnover calculated as total certified payments received for contracts in progress or completed, within the last three (03) years . for Section-7 PKR 20.059 billion or US\$ 71.64 million equivalent	Must meet requirement	Must meet requirement	Must meet 25% of the requirement	Must meet 40% of the requirement	Form FIN-3.3.2
3.4 Experience							
3.4.1	General Construction Experience	Experience under construction contracts in the role of prime contractor, joint venture member or subcontractor for at least the last ten (10) years, starting January 1, 2016.	Must meet requirement	N/A	Must meet requirement	N/A	Form EXP-3.4.1
3.4.2 (a)	Specific Construction and Contract	Participation as a contractor, Joint Venture partner, or Subcontractor ⁶ , in at least one contract that has been satisfactorily and	Must meet requirement	N/A	N/A	Must meet requirement.	Form EXP-3.4.2(a) For substantial completion copy of the

⁶ For contracts under which the Tenderer participated as a Joint Venture member or Subcontractor, only the Tenderer's share, by value, shall be considered to meet this requirement.

	Management Experience⁵	substantially ⁷ completed within the last seven (07) years and that is similar to the proposed works, where the value of the Tenderer's participation exceeds amounts mentioned below. The similarity of the Tenderer's participation shall be based on: <ol style="list-style-type: none"> 1. the physical size 2. nature of works 3. complexity, methods 4. technology or 5. other characteristics as described in Section 7, Employer's Requirements					relevant Interim Payment Certificates or others may be submitted.		
		<table border="1"> <tr> <td>for Section-7</td> <td>PKR 21.396 billion or US\$ 76.41 million equivalent</td> </tr> </table>	for Section-7	PKR 21.396 billion or US\$ 76.41 million equivalent					
for Section-7	PKR 21.396 billion or US\$ 76.41 million equivalent								
3.4.2 (b)		For the above and other contracts executed during the period indicated in 3.4.2 (a) above, a minimum construction experience is required in the following key	Must meet requirement	N/A	N/A	Must meet requirements	Form EXP-3.4.2(b)		

⁵ In the case of JV, the value of contracts completed by its members shall not be aggregated to determine whether the requirement of the minimum value of a single contract has been met. Instead, each contract performed by each member shall satisfy the minimum value of a single contract as required for single entity. In determining whether the JV meets the requirement of total number of contracts, only the number of contracts completed by all members each of value equal or more than the minimum value required shall be aggregated.

⁷ Substantial completion shall be based on 80 percent or more works completed under the contract.

		<p>activities</p> <p>Section 7: Rawalpindi-Hassanabdal Road (40KM)</p> <p>Embankment</p> <p>89,708 Cu.m/ in any one year</p> <p>Base / Sub-Base</p> <p>196,267 Cu.m/ in any one year</p> <p>Asphaltic Concrete Pavement</p> <p>116,306 Cu.m/ in any one year</p> <p>Concrete (for major and minor roads structures)</p> <p>37,423 Cu.m/ in any one year</p>					
3.4.2 (c)	Specific Experience in managing ESHS Aspects	For the contracts in 3.4.2 (a) above and/or any other contracts [substantially completed and under implementation] as prime Contractor, joint venture member, or Subcontractor within the last seven (07) years, experience in managing ESHS risks and	Must meet requirements	N/A	N/A	Lead firm Must meet requirement	Form EXP – 3.4.2 (c)

		<p>impacts in the following aspects:</p> <ul style="list-style-type: none"> • Details of safety records / statistics in terms of lost time incident frequency and any deaths • ESHS compliance aligned with national and international standards. • Requirement to submit an ESHS Management Plan as part of the bid. • Commitment to appoint qualified ESHS staff on-site (e.g., ESHS Manager, Safety Officer, etc.). • Project ESHS Plan used (including Key Performance Indicators and ESHS reporting to Employer) • Organization / Institutional chart and responsibilities for the project with reference to the ESHS aspects • Experience of implementing Construction Environmental and Social Management Plans including Site 					
--	--	--	--	--	--	--	--

		<p>Restoration Plan, Waste Management Plan, Hazardous Waste Management Plan, Traffic Management Plan, Labor Management Plan, Community H&S plan, Chance find plan, Grievance Record and response procedures, Gender Action Plan, Construction Camp Management Plan, Site Specific Health and Safety Management Plans, ESHS Control Plan for Subcontractors, Risk assessment/mitigation plan, ESHS in-house Audits Plan</p> <ul style="list-style-type: none"> • Strategy for staff and labor recruitment of temporary workforce and local labor, worker grievance mechanism • Strategy for communication and interaction with stakeholders and local communities • Availability of a valid ISO 					
--	--	---	--	--	--	--	--

		<p>Certification as below:</p> <ul style="list-style-type: none"> ○ Quality Management Certificate ISO 9001:2015 ○ Environmental Management Certificate ISO 14001:2015. <p>Occupational Health and Safety Management Certificate ISO 45001:2018.</p>					
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4. Contractor's Representative and Key Personnel

The Tenderer must demonstrate that it will have a suitably qualified Contractor's Representative and suitably qualified (and in adequate numbers) Key Personnel, as described in the table below.

The Tenderer shall provide details of the Contractor's Representative and Key Personnel and such other Key Personnel that the Tenderer considers appropriate to perform the Contract, together with their academic qualifications and work experience. The Tenderer shall complete the relevant Forms PER1 and PER-2 in Section 4, Tender Forms.

The Contractor shall require the Employer's consent to substitute or replace the Contractor's Representative (reference General Conditions of Contract Sub Clause 4.3) and any of the Key Personnel (reference the Particular Conditions of Contract Sub Clause 1.1.2.7).

Contractor's Key Personnel Requirement (Construction Staff)

No	Position	Minimum Qualification	Total Work Experience (years)	Experience in Similar Work (years)	No of Positions Required for Section-7
1	Project Manager	Bachelor's in Engineering (Civil Engineering)	20	10	1
2	Deputy Project Manager	Bachelor's in Engineering (Civil Engineering) or equivalent	10	5	1
3	Construction Manager	Master's in Construction Management	10	5	1
4	Material Engineer	Bachelor's in Engineering (Civil Engineering) / Geological or equivalent	10	5	1
5	Planning Engineer	Bachelor's in Engineering (Civil Engineering)	10	5	1
6	QA/QC Engineer	Bachelor's in Engineering (Civil Engineering)	10	5	1
7	Site Engineers	Bachelor's in Engineering (Civil Engineering) or equivalent Professional qualification	10	5	6
8	Chief Surveyor	Diploma of Associate Engineer (Civil Engineering)	15	10	1
9	Quantity Surveyor	Diploma of Associate Engineer (Civil Engineering)	15	10	2

Contractor's Key Personnel Requirement
(Environmental and Social Staff)

No	Position	Minimum Qualification	Minimum Years of Relevant Work Experience	No. of Positions Required for Section-7
1	Lead EHS	Master Degree in environmental engineering/ environmental sciences, environmental management or related discipline along with NEBOSH	10	1
2	Environmental Specialist	M.Sc environmental engineering/ environmental sciences, environmental management or related discipline	10	1
3	Social Specialist	Master in Social Sciences or equivalent Professional qualification	10	1
4	OHS Specialist	B.Sc. environmental engineering/ environmental management or equivalent Professional qualification along with NEBOSH	5	1
5	Community Liaison/ Communication Officer	Bachelor Degree in Sociology or equivalent Professional qualification with strong grasp of local language(s)	5	1
6	EHS Supervisors	B.Sc. environmental engineering/ environmental management or equivalent Professional qualification along with Safety Certification	5	6
7	Flagmen	Literate with Suitable Certification	2	25
8	Medical Doctors	PMDC Licensed Doctor	5	1
9	Medical Technicians	Diploma in Emergency Medical Technician (EMT) or Diploma in Emergency Medical Response	3	2

5. Equipment Requirement

No	Position/ Specialization	Capacity	Minimum Number Required for Section 7
1.	Bull Dozer	200 HP	11
2.	Motor Grader	140 HP	8
3.	Wheel Loader	110 hp	13
4.	Dump Trucks	12-15 cu.m	40
5.	Excavators	100HP	10
6.	Compressor	400 CFM	4
7.	Tandom Roller	10-12t	15
8.	Combination Roller	10-12t	15
9.	PTR Rollers	15-18t	10
10.	Power Broom	90 HP	5
11.	Bitumen Dist. Tow Type	4000L	1
12.	Chip Spreader		1
13.	Asphalt Plant	170cu.m/hr	1
14.	Asphalt Paver (4 m wide)		1
15.	Aggregate Spreader		1
16.	Concrete Batching Plant	90 cum/hr	1
17.	Concrete Static Mixture	0.5 cum	6
18.	Concrete Transit Mixer	6 cum	16
19.	Piling Rigs		5
20.	Girder Launcher	100 Ton	3
21.	Concrete Pump	60cum/hr	4
22.	Concrete Slip from paver for Barrier, curbs, sidewalk		1
23.	Tractor	75 HP	4
24.	Tractor and Trolley	60 HP	13
25.	Water Bowser	12000 Liter	18
26.	Flat Body Truck	4.5T	5
27.	Road Marking Machine		1
28.	Stressing Machinery		4
29.	Trailer Low Bed		3
30.	Cranes	50T	6
31.	Welding Plants	5	5
32.	Froging/ Shape Machine	4	4
33.	Diesel Generator	160/250 KVA	4

The Tenderer shall provide further details of proposed items of equipment using Form EQU in Section 4, Tender Forms.

6. Evaluation - Financial Part

6.1. Provision for Development of Domestic Industry (ITT 38)

If the Tender Data Sheet so specifies, the Employer will grant the application of provision for development of domestic industry and specify the details below.

Not Applicable

6.2 Alternative Completion Times

Not Applicable

6.3 Alternative Technical Solutions for Specified Parts of Works

Not Applicable

6.4 Sustainable Procurement

The Tenderer shall adopt sustainable procurement practices, including selection of suppliers and materials that minimize environmental and social impact, comply with national/provincial labor and environmental laws (as mentioned in E&S instruments), and support resource efficiency. Preference shall be given to locally available, recycled, and low-carbon materials where technically and economically feasible. Tenderer shall ensure E&S due diligence for all activities which might have significant E&S impacts on environment.

6.5 Other Criteria

The Tenderer shall submit the following valid ISO as well as other relevant ESHS Certifications as part of the tender not limited to.

- Quality Management Certificate ISO 9001:2015
- Environmental Management Certificate ISO 14001.2015.
- Occupational Health and Safety Management Certificate ISO 45001:2018.

7. Combined Evaluation

Not Applicable.

Section 4 - Tender Forms

Forms

Letter of Tender – Technical Part	69
Attachment 1 to Letter of Tender	72
Appendix A to Technical Part: Technical Proposal	75
Site Organization	76
Method Statement	77
Mobilization Schedule.....	78
Construction Schedule.....	79
ESHS Management Strategies and Implementation Plans.....	80
Code of Conduct for Contractor’s Personnel (ESHS)	81
Appendix B to Technical Part: Equipment	85
Form EQU: Equipment	85
Appendix C to Technical Part: Key Personnel	86
Form PER-1.....	86
Form PER-2:.....	88
Appendix D to Technical Part: Tenderer’s Qualification	90
Form ELI-1.1.....	91
Form ELI-1.2.....	92
Form CON-2	93
Form CON-3.....	96
Form FIN-3.3.1	98
Form FIN-3.3.2	100
Form FIN-3.3.3	101
Form FIN-3.3.4	102
Form FIN-3.3.5	103
Form EXP-3.4.1	105
Form EXP-3.4.2(a).....	106

Form EXP-3.4.2(b).....	111
Form EXP-3.4.2(c).....	111
Appendix E to Technical Part: Tender Security	112
Form of Demand Guarantee	112
Form of Tender-Securing Declaration	113
Letter of Tender – Financial Part.....	114
Appendix A to Financial Part.....	116
Schedule of Cost Indexation.....	116
Table of Adjustment Data.....	117
Table A. Local Currency.....	117
Table B. Foreign Currency (FC).....	118
Table C. Summary of Payment Currencies	119
Appendix B to Financial Part: Bill of Quantities	120

Letter of Tender – Technical Part

INSTRUCTIONS TO TENDERERS: DELETE THIS BOX ONCE YOU HAVE COMPLETED THE DOCUMENT

The Tenderer must prepare this Letter of Tender on stationery with its letterhead clearly showing the Tenderer's complete name and business address.

Note: All italicized text is to help Tenderers in preparing this form.

Date of this Tender submission: *[insert date (as day, month and year) of Tender submission]*

Tender No.: *[insert tender reference number]*

Alternative No.: *[insert reference number if this is a Tender for an alternative]*

To: General Manager (P&CA)

National Highway Authority

28-Mauve Area, Sector: G-9/1

2nd Floor, Room No. 223

City: Islamabad

ZIP Code: 44000

Country: Pakistan

Telephone: 00-92-51-9032727

Fax: 00-92-51-9260419

E-mail: gmpca.nha@gmail.com & gmpca@nha.gov.pk

We, the undersigned, hereby submit our Tender, in two parts sealed separately, namely: (a) the Technical Part; and (b) the Financial Part.

In submitting our Tender, we declare that:

- (a) **No Reservations:** We have examined and have no reservations to the Tender Document, including Addenda issued in accordance with ITT 8.
- (b) **Eligibility:** We meet the eligibility requirements and have no conflict of interest in accordance with ITT 4.
- (c) **Tender-Securing Declaration:** We have not been suspended nor declared ineligible by the Employer based on execution of a Tender-Securing or Proposal-Securing Declaration in the Employer's Country in accordance with ITT 4.7.

- (d) **Conformity:** We offer to execute in conformity with the Tender Document and in accordance with the implementation and completion specified in the construction schedule, the following Works:

Reconstruction of National Highway N-5 Under Pakistan Resilient Recovery, Rehabilitation and Reconstruction Framework Project, Phase I-A (141 KM)

➤ **Section-7: Rawalpindi-Hassanabdal Road (40 KM)**

- (e) **Tender Validity Period:** Our Tender shall be valid for the period specified in TDS 18.1 (as amended, if applicable) from the date fixed for the Tender submission deadline specified in TDS 22.1 (as amended, if applicable), and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
- (f) **Performance Security** If our Tender is accepted, we commit to obtain a Performance Security in accordance with the Tender Document.
- (g) **One Tender Per Tenderer:** We are not participating, as a Tenderer, either individually or as a Joint Venture member, in more than one Tender in this tendering process, and meet the requirements of ITT 4.3, other than alternative Tenders submitted in accordance with ITT 13.
- (h) **Suspension and Debarment:** We, along with any of our subcontractors, suppliers, consultants, manufacturers or service providers for any part of the contract, are not subject to, and not controlled by any entity or individual that is subject to, a temporary suspension or a debarment or any ineligibility imposed or recognized by the Bank. Further, we are not ineligible under the Employer's Country laws or official regulations or pursuant to a decision of the United Nations Security Council.
- (i) **State-Owned Enterprise or Institution:** *[select the appropriate option and delete the other] [We are not a state-owned enterprise or institution] / [We are a state-owned enterprise or institution but meet the requirements of ITT 4.6].*
- (j) **Binding Contract:** We understand that this Tender, together with your written acceptance thereof included in your Letter of Acceptance, shall constitute a binding contract between us, until a formal contract is prepared and executed.
- (k) **Employer Not Bound to Accept:** We understand that you are not bound to accept the lowest evaluated cost Tender, the Most Advantageous Tender or any other Tender that you may receive.

- (l) **Prohibited Practice:** We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf engages in any type of Prohibited Practice.
- (m) **Inspection and Audit:** We agree to permit the Bank or its representative to inspect our accounts and records and other documents relating to the tender submission and to have them audited by auditors appointed by the Bank.
- (n) We acknowledge that the Appendix to Tender and Attachment 1 to the Letter of Tender – Covenant of Integrity, form part of this Letter of Tender.

Name of the Tenderer: * *[insert complete name of person signing the Tender]*

Name of the person duly authorized to sign the Tender on behalf of the Tenderer:
***[insert complete name of person duly authorized to sign the Tender]*

Title of the person signing the Tender: *[insert complete title of the person signing the Tender]*

Signature of the person named above: *[insert signature of person whose name and capacity are shown above]*

Date signed *[insert date of signing]* **day of** *[insert month]*, *[insert year]*

*: In the case of the Tender submitted by joint venture specify the name of the Joint Venture as Tenderer

** : Person signing the Tender shall have the power of attorney given by the Tenderer. The power of attorney shall be attached with the Letter of Tender.

Attachment 1 to Letter of Tender

Covenant of Integrity

**To: General Manager (P&CA)
National Highway Authority
28-Mauve Area, Sector: G-9/1
2nd Floor, Room No. 223
City: Islamabad
ZIP Code: 44000
Country: Pakistan
Telephone: 00-92-51-9032727
Fax: 00-92-51-9260419
E-mail: gmpca.nha@gmail.com & gmpca@nha.gov.pk**

We declare and covenant that neither we nor anyone, including any of our subsidiaries and affiliates, and all of our directors, employees, agents or joint venture members, as well as any subcontractors, suppliers, sub-suppliers, concessionaires, consultants or sub-consultants, where these exist, acting on our behalf with due authority or with our knowledge or consent, or facilitated by us, has engaged, or will engage, in any Prohibited Practice (as defined In Section VI – Prohibited Practices) in connection with the procurement process or in the execution or supply of any works, goods or services for *[insert the name of the Contract]* (the “Contract”) and covenant to so inform you if any instance of any such Prohibited Practice shall come to the attention of any person in our organization having responsibility for ensuring compliance with this Covenant.

We declare that we have paid, or will pay, the following commissions, gratuities, or fees with respect to the procurement process or execution of the Contract:

Name of Recipient	Address	Reason(s)	Amount

We declare that no affiliate of the Employer is participating in our submission in any capacity whatsoever.

We shall, for the duration of the procurement process and, if we are successful in our tender, for the duration of the Contract, appoint and maintain in office an officer, who shall be a person reasonably satisfactory to you and to whom you shall have full and immediate access, having the duty, and the necessary powers, to ensure compliance with this Covenant.

We declare and covenant that, except for the matters disclosed in this Covenant of Integrity:

- (i) we, our subsidiaries and affiliates, and all of our directors, employees, agents or joint venture members, where these exist, have not been convicted in any court of any offence involving a Prohibited Practice in connection with any procurement process or provision of works, goods or services during the ten years preceding the date of this Covenant;
- (ii) none of our directors, employees, agents or a representatives of a joint venture member, where these exist, has been dismissed or has resigned from any employment on the grounds of being implicated in any Prohibited Practice during the ten years preceding the date of this Covenant;
- (iii) we, our subsidiaries and affiliates and our directors, employees, agents or joint venture members, where these exist, have not been excluded by any major Multilateral Development Bank or International Financial Institution (including World Bank Group, Asian Infrastructure Investment Bank, Asian Development Bank, African Development Bank Group, European Bank for Reconstruction and Development, European Investment Bank or Inter-American Development Bank) from participation in a procurement procedure or entering into a contract with any of such institutions on the grounds of engaging in a Prohibited Practice;
- (iv) we, our directors, subsidiaries and affiliates, as well as any subcontractors, or suppliers or affiliates of the subcontracts or supplier are not subject to any sanction imposed by resolution of the United Nations Security Council; and
- (v) we further undertake to immediately inform the Employer and the Bank if this situation were to occur at a later stage.

If applicable, full disclosure of any convictions, dismissal, resignations, exclusions or other information relevant to Clause (i), (ii), (iii) or (iv) are provided below:

Name of Entity Required to be Disclosed	Reason for Disclosure is Required ¹

We understand that a misrepresentation in relation to or an omission to provide full disclosure of the information as required by this Covenant may result in the rejection of the tender and it may also lead to actions to be taken as set out in accordance with the Bank’s Policy and the Directive on Prohibited Practices.

At any time following the submission of our tender, we shall permit, and shall cause our JV members, as well as our directors, employees, agents, Subcontractors and any other third parties engaged or involved for any part of the Contract to permit the Bank and/or persons appointed by them, the right to inspect and copy all accounts, books, records,

¹ For each matter disclosed, provide details of the measures that were taken, or shall be taken, to ensure that neither the disclosed entity nor any of its directors, employees or agents commits any prohibited conduct in connection with the procurement process for the Contract.

and other documents (on any media or in any format) relating to the procurement process and execution of the Contract and to have any such accounts, books, records, and documents audited the Bank and by auditors appointed by the Bank. We accept to preserve these records generally in accordance with applicable law but in any case for at least six years from the date of substantial completion of the Contract.

Name:	
In the capacity of:	
Signed:	
Duly authorized to sign for and on behalf of:	
Date:	

Appendix A to Technical Part: Technical Proposal

- **Site Organization**
- **Method Statement**
- **Mobilization Schedule**
- **Construction Schedule**
- **ESHS Management Strategies and Implementation Plans**
- **Code of Conduct for Contractor's Personnel (ESHS)**
- **Others**

Site Organization

[insert Site Organization information]

Method Statement

[insert Method Statement]

Mobilization Schedule

[insert Mobilization Schedule]

Construction Schedule

[insert Construction Schedule]

ESHS Management Strategies and Implementation Plans

(ESHS-MSIP)

The Tenderer shall submit comprehensive and concise Environmental, Social, Health and Safety Management Strategies and Implementation Plans (ESHS-MSIP) as required by ITT 11.2(h) of the Tender Data Sheet. These strategies and plans shall describe in detail the actions, materials, equipment, management processes etc. that will be implemented by the Contractor, and its subcontractors.

In developing these strategies and plans, the Tenderer shall have regard to the ESHS provisions of the contract, ESIA/ESMP along with other E&S documents including those as may be more fully described in the Works' Requirements in Section 7. The submission must include:

- Site Specific risk register for each major work with reference to final ESIA/ESMP.
- Detailed outlines demonstrating the Tenderer's methodology for developing and implementing ESHS plans list in PCC Part B and as per approved final ESIA/ESMP and other E&S instruments (LMP, SEP, GAPF, RAP, ESAP, etc.) including but not limited to C-ESMP, OCHSMP, traffic management plan, waste management plan, construction camp management plan, emergency response plan, etc.
- Monitoring and reporting protocols: a proposed protocol for monthly ESHS reporting including draft template for data collection on incident, inspection, grievance and monitoring as per final approved ESIA/ESMP and other project specific E&S instruments (LMP, SEP, GAP, RAP, ESAP, etc.).
- Demonstrating ESHS team qualification and experience matching or exceeding the requirements listed in Section 3 (Key personnel)

Code of Conduct for Contractor's Personnel (ESHS) Form

CODE OF CONDUCT FOR CONTRACTOR'S PERSONNEL(ESHS)

Note to the Tenderer:

The minimum content of the Code of Conduct form as set out by the Employer shall not be substantially modified. However, the Tenderer may add requirements as appropriate, including to take into account Contract-specific issues/risks.

The Tenderer shall initial and submit the Code of Conduct form as part of its Tender.

We are the Contractor, *[enter name of Contractor]* for the project (enter name of the project) we have signed a contract with *[enter name of Employer]* for *[enter specific description of the Works]*. These Works will be carried out at *[enter the Site and other locations where the Works will be carried out]*. Our contract requires us to implement measures to address environmental and social risks related to the Services and Works, including the risks of misdemeanor in workplace / worker's camps, sexual exploitation, abuse, harassment, and gender-based violence.

This Code of Conduct is part of the measures to deal with environmental and social risks related to the Works. This involves all workers, labor camps and the workplace. It applies to all our staff, laborers and other employees at the Works Site or other places where the Works are being carried out. It also applies to the personnel of each subcontractor and any other personnel assisting us in the execution of the Works. All such persons are referred to as "**Contractor's Personnel**" and are subject to this Code of Conduct.

This Code of Conduct identifies the conduct that is required from all Contractor's Personnel.

In our workplace, unsafe, offensive, abusive, or violent behavior will not be tolerated, and all persons should feel comfortable raising issues or concerns without fear of retaliation. Contractor's Personnel shall:

General Conduct

1. Make earnest efforts to understand his/her responsibilities detailed in this Code of Conduct and any other documents and trainings, as directed by the Employer. Proactively seek clarifications to enable work to be undertaken in strict compliance with this Code of Conduct.
2. Carry out his/her duties competently and diligently.
3. Comply with this Code of Conduct and all applicable laws, regulations, and other requirements, including requirements to protect the health, safety and well-being of other Contractor's Workers, colleagues working under the same contractor and any other person.
4. Maintain a safe working environment by:
 - a. Abiding by safety guidelines to ensure that workplaces, machinery, equipment, and processes under each person's control are safe and without risk to health.
 - b. Using required Personal Protective Equipment.

- c. All works are conducted with safety clearance and under appropriate supervision.
 - d. Using appropriate measures relating to chemical, physical, and biological substances, and agents.
 - e. Following applicable emergency operating procedures.
 - f. Providing separate, safe, and easily accessible working and accommodation facilities for women and men working on the site.
5. Report to the Supervisor about work situations that he/she believes are not safe or healthy and remove himself/herself from a work situation which he/she believes presents an imminent and danger to his/her life or health.
 6. Treat other people with respect, and not discriminate against specific groups such as women, persons with different sexual orientation, people with disabilities, migrant workers, or children.
 7. Not engage in sexual harassment which includes unwelcome sexual advances, requests for sexual favors, and other unwanted verbal or physical conduct of a sexual nature in the workplace or with respect to neighboring communities.
 8. Engage with the community and/or project affected persons with utmost respect. Intimidation, threats, and coercive behavior will not be tolerated.
 9. Not engage in sexual exploitation and abuse, which means any actual or attempted abuse of position of vulnerability, differential power, or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially, or politically from the sexual exploitation of another.
 10. Not engage in sexual assault, which means any form and/or threat of non-consensual sexual contact.
 11. Not engage in any form of sexual activity with individuals under the age of 18.
 12. Not make any inappropriate and unwanted sexual advances to people in the adjoining (host) communities or settlements.
 13. Not work or be present in the worksite(s) under the influence of any intoxicating substances, such as alcohol or drugs.
 14. Not possess alcohol or any other illegal/ intoxicating substances while on duty or in the labor camps.
 15. Return to the labor camp no later than 22:00, unless working on night shift.
 16. Participate and complete relevant training courses that will be provided related to the environmental and social aspects of the Contract, including on health and safety matters, Gender-based violence (GBV), Sexual Exploitation, Abuse and Harassment (SEAH).
 17. Report violations of this Code of Conduct.
 18. Not retaliate against any person who reports violations of this Code of Conduct, whether to AIIB or the Employer, or who makes use of the grievance mechanism for Contractor's Workers or the project's Grievance Redress Mechanism.

RAISING CONCERNS: *An appropriate GRM shall be constituted by the contractor for grievances in the worksite. This shall include an effective mechanism for receiving and promptly addressing allegations of SEA and/or SH from the Contractor's or Employer's Personnel or any other person including third parties.*

If any person observes a behavior that he/she believes may represent a violation of this Code of Conduct, or that otherwise concerns him/her, he/she shall raise the issue promptly. This can be done in either of the following ways:

1. Contact [*enter name of the Contractor's Social Expert*] in writing at this address [X] or by telephone at [X] or in person at [X]; or
2. Call [X] to reach the Contractor's hotline (*if any*) and leave a message.

The Complainant's identity will be kept confidential, unless reporting of allegations is mandated by the country law. Anonymous complaints or allegations may also be submitted and will be given all due and appropriate consideration. We take seriously all reports of possible misconduct and will investigate and take appropriate action. We will provide warm referrals to service providers that may help support the person who experienced the alleged incident, as appropriate.

There will be no retaliation against any person who raises a concern in good faith about any behavior prohibited by this Code of Conduct. Such retaliation would be a violation of this Code of Conduct.

CONSEQUENCES OF VIOLATING THE CODE OF CONDUCT

Any violation of this Code of Conduct by Contractor's Personnel may result in serious consequences, up to and including termination and possible referral to legal authorities.

The information contained in this note will be disseminated to all Contractor's Personnel. At the time of engagement of any worker/ personnel, the above information will be provided verbally, and a copy of the Code of Conduct will be provided signed by the Personnel and countersigned by the Contractor. A prototype is provided below:

FOR CONTRACTOR'S PERSONNEL:

I have received a copy of this Code of Conduct written in [X] language that I understand. I recognize that if I have any questions about this Code of Conduct, I can contact [*enter name of Contractor's contact person with relevant background in handling gender-based violence*] requesting an explanation.

Name of Contractor's Personnel: [insert name]

Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Contractor: [insert name]

Signature: _____

Date: (day month year): _____

ATTACHMENT 1: Behaviors constituting Sexual Exploitation and Abuse (SEA) and behaviors constituting Sexual Harassment (SH)

The following non-exhaustive list is intended to illustrate types of prohibited behaviors:

1. Examples of sexual exploitation and abuse include, but are not limited to:
 - A Worker/Expert tells a member of the community that he/she can get them jobs in the work site (e.g., cooking and cleaning) in exchange for sex.
 - A Worker/Expert that is connecting electricity input to households says that he can connect women headed households to the grid in exchange for sex.
 - A Worker/Expert rapes, or otherwise sexually assaults a member of the community.
 - A Worker/Expert denies a person access to the Site unless he/she performs a sexual favor.
 - A Worker/Expert tells a person applying for employment under the Contract that he/she will only hire him/her if he/she has sex with him/her.
2. Examples of sexual harassment in a work context
 - A Worker/Expert comment on the appearance of another Worker/Expert (either positive or negative) and sexual desirability.
 - When a Worker/Expert complains about comments made by another Worker/Expert on his/her appearance, the other Worker/Expert comment that he/she is “asking for it” because of how he/she dresses.
 - Unwelcome touching of a Worker/Expert or Employer’s Personnel by another Worker/Expert.
 - A Worker/Expert tells another Worker/Expert that he/she will get him/her a salary raise, or promotion if he/she sends him/her naked photographs of himself/herself.

In addition, the Tenderer shall submit an outline of how this Code of Conduct will be implemented. This will include: how it will be introduced into conditions of employment/engagement, what training will be provided, how it will be monitored and how the Contractor proposes to deal with any breaches.

Appendix B to Technical Part: Equipment

Form EQU: Equipment

The Tenderer shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key equipment listed in Section 3, Evaluation and Qualification Criteria. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Tenderer.

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

Omit the following information for equipment owned by the Tenderer.

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

Appendix C to Technical Part: Key Personnel

Form PER-1

Contractor’s Representative and Key Personnel Schedule

Tenderers should provide the names and details of the suitably qualified Contractor’s Representative and Key Personnel to perform the Contract. The data on their experience should be supplied using the Form PER-2 below for each candidate.

Contractor’ Representative and Key Personnel

1.	Title of position: Contractor’s Representative	
	Name of candidate:	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g., attach high-level Gantt chart]</i>
2.	Title of position: <i>[Environmental Specialist]</i>	
	Name of candidate:	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g., attach high-level Gantt chart]</i>

3.	Title of position: <i>[Health and Safety Specialist]</i>	
	Name of candidate:	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g., attach high-level Gantt chart]</i>
4.	Title of position: <i>[Social Specialist]</i>	
	Name of candidate:	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g., attach high-level Gantt chart]</i>
5.	Title of position: <i>[insert title]</i>	
	Name of candidate	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g., attach high-level Gantt chart]</i>

**Form PER-2:
Resume and Declaration
Contractor's Representative and Key Personnel**

Name of Tenderer

Position [#1]: [title of position from Form PER-1]											
Personnel information	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">Name:</td> <td>Date of birth:</td> </tr> <tr> <td>Address:</td> <td>E-mail:</td> </tr> <tr> <td colspan="2">Professional qualifications:</td> </tr> <tr> <td colspan="2">Academic qualifications:</td> </tr> <tr> <td colspan="2">Language proficiency: <i>[language and levels of speaking, reading and writing skills]</i></td> </tr> </table>	Name:	Date of birth:	Address:	E-mail:	Professional qualifications:		Academic qualifications:		Language proficiency: <i>[language and levels of speaking, reading and writing skills]</i>	
Name:	Date of birth:										
Address:	E-mail:										
Professional qualifications:											
Academic qualifications:											
Language proficiency: <i>[language and levels of speaking, reading and writing skills]</i>											
Details	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2">Address of employer:</td> </tr> <tr> <td>Telephone:</td> <td>Contact (manager / personnel officer):</td> </tr> <tr> <td>Fax:</td> <td></td> </tr> <tr> <td>Job title:</td> <td>Years with present employer:</td> </tr> </table>	Address of employer:		Telephone:	Contact (manager / personnel officer):	Fax:		Job title:	Years with present employer:		
Address of employer:											
Telephone:	Contact (manager / personnel officer):										
Fax:											
Job title:	Years with present employer:										

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

Project	Role	Duration of involvement	Relevant experience
<i>[main project details]</i>	<i>[role and responsibilities on the project]</i>	<i>[time in role]</i>	<i>[describe the experience relevant to this position]</i>

Declaration

I, the undersigned [*insert either "Contractor's Representative" or "Key Personnel" as applicable*], certify that to the best of my knowledge and belief, the information contained in this Form PER-2 correctly describes myself, my qualifications and my experience.

I confirm that I am available as certified in the following table and throughout the expected time schedule for this position as provided in the Tender:

Commitment	Details
Commitment to duration of contract:	<i>[insert period (start and end dates) for which this Contractor's Representative or Key Personnel is available to work on this contract]</i>
Time commitment:	<i>[insert period (start and end dates) for which this Contractor's Representative or Key Personnel is available to work on this contract]</i>

I understand that any misrepresentation or omission in this Form may:

- (a) be taken into consideration during Tender evaluation;
- (b) result in my disqualification from participating in the Tender; and
- (c) result in my dismissal from the contract.

Name of Contractor's Representative or Key Personnel: [*insert name*]

Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Tenderer:

Signature: _____

Date: (day month year): _____

Appendix D to Technical Part: Tenderer's Qualification

To establish its qualifications to perform the contract in accordance with Section 3, Evaluation and Qualification Criteria the Tenderer shall provide the information requested in the corresponding Information Sheets included hereunder.

Form ELI-1.1

Tenderer Information Form

Date: _____

Tender No. and title: _____

Page _____ of _____ pages

Tenderer's name
In case of Joint Venture (JV), name of each member:
Tenderer's actual or intended country of registration: <i>[indicate country of Constitution]</i>
Tenderer's actual or intended year of incorporation:
Tenderer's legal address [in country of registration]:
Tenderer's authorized representative information Name: _____ Address: _____ Telephone/Fax numbers: _____ E-mail address: _____
1. Attached are copies of original documents of <input type="checkbox"/> Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of registration of the legal entity named above, in accordance with ITT 4.4 <input type="checkbox"/> In case of JV, letter of intent to form JV or JV agreement, in accordance with ITT 4.1 <input type="checkbox"/> In case of state-owned enterprise or institution, in accordance with ITT 4.6, documents establishing: <ul style="list-style-type: none">• operation on a commercial basis,• financial and managerial autonomy,• day-to-day management not controlled by the government and• not under the supervision of the Employer or its procuring agency.
2. Included are the organizational chart, a list of Board of Directors and the beneficial ownership. <i>[If required under TDS ITT 49.1, the successful Tenderer shall provide additional information on beneficial ownership, using the Beneficial Ownership Disclosure Form.]</i>

Form ELI-1.2

**Tenderer's JV Information Form
(to be completed for each member of Tenderer's JV)**

Date: _____

TENDER No. and title: _____

Page _____ of _____ pages

Tenderer's JV name:
JV member's name:
JV member's country of registration:
JV member's year of constitution:
JV member's legal address in country of constitution:
JV member's authorized representative information Name: _____ Address: _____ Telephone/Fax numbers: _____ E-mail address: _____
1. Attached are copies of original documents of <input type="checkbox"/> Articles of Incorporation (or equivalent documents of constitution or association), and/or registration documents of the legal entity named above, in accordance with ITT 4.4. <input type="checkbox"/> In case of a state-owned enterprise or institution, documents establishing operation on a commercial basis; financial and managerial autonomy; day-to-day management not controlled by the government; and not under the supervision of the Employer or its procuring agency, in accordance with ITT 4.6. 2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership. <i>[If required under TDS ITT 49.1, the successful Tenderer shall provide additional information on beneficial ownership for each JV member using the Beneficial Ownership Disclosure Form.]</i>

Form CON-2

Historical Contract Nonperformance, Pending Litigation and Litigation History

Tenderer's Name: _____

Date: _____

JV Member's Name _____

Tender No. and title: _____

Page _____ of _____ pages

Nonperformed Contracts in accordance with Section 3, Evaluation and Qualification Criteria

- Contract nonperformance did not occur since January 1, *[insert year]* specified in Section 3, Evaluation and Qualification Criteria, Sub-Factor 3.2.1.
- Contract(s) not performed since January 1, *[insert year]* specified in Section 3, Evaluation and Qualification Criteria, requirement 3.2.1

Year	Nonperformed portion of contract	Contract Identification	Total Contract Amount (current value, currency, exchange rate and USD equivalent)
<i>[insert year]</i>	<i>[insert amount and percentage]</i>	Contract Identification: <i>[indicate complete contract name/ number and any other identification]</i> Name of Employer: <i>[insert full name]</i> Address of Employer: <i>[insert street/city/country]</i> Reason(s) for nonperformance: <i>[indicate main reason(s)]</i>	<i>[insert amount]</i>

Pending Litigation, in accordance with Section 3, Evaluation and Qualification Criteria

- No pending litigation in accordance with Section 3, Evaluation and Qualification Criteria, Sub-Factor 3.2.3.
- Pending litigation in accordance with Section 3, Evaluation and Qualification Criteria, Sub-Factor 3.2.3 as indicated below.

Year of dispute	Amount in dispute (currency)	Contract Identification	Total Contract Amount (currency), USD Equivalent (exchange rate)
		Contract Identification: _____ Name of Employer: _____ Address of Employer: _____ Matter in dispute: _____ Party who initiated the dispute: _____ Status of dispute: _____	
		Contract Identification: Name of Employer: Address of Employer: Matter in dispute: Party who initiated the dispute: Status of dispute:	
Litigation History in accordance with Section 3, Evaluation and Qualification Criteria			
<input type="checkbox"/> No Litigation History in accordance with Section 3, Evaluation and Qualification Criteria, Sub-Factor 3.2.4.			
<input type="checkbox"/> Litigation History in accordance with Section 3, Evaluation and Qualification Criteria, Sub-Factor 3.2.4 as indicated below.			
Year of award	Outcome as percentage of Net Worth	Contract Identification	Total Contract Amount (currency), USD Equivalent (exchange rate)

<i>[insert year]</i>	<i>[insert percentage]</i>	Contract Identification: [indicate complete contract name, number and any other identification] Name of Employer: <i>[insert full name]</i> Address of Employer: <i>[insert street/city/country]</i> Matter in dispute: <i>[indicate main issues in dispute]</i> Party who initiated the dispute: <i>[indicate "Employer" or "Contractor"]</i> Reason(s) for Litigation and award decision <i>[indicate main reason(s)]</i>	<i>[insert amount]</i>
----------------------	----------------------------	--	------------------------

Form CON-3

Environmental, Social, Health and Safety Performance Declaration

[The following table shall be filled in for the Tenderer, each member of a Joint Venture and each Specialized Subcontractor]

Tenderer's Name: *[insert full name]*

Date: *[insert day, month, year]*

Joint Venture Member's or Specialized Subcontractor's Name: *[insert full name]*

Tender No. and Title: *[insert Tender number and title]*

Page *[insert page number]* of *[insert total number]* pages

Environmental, Social, Health and Safety Performance Declaration in accordance with Section 3, Qualification Criteria and Requirements			
<input type="checkbox"/> No suspension or termination of contract: An employer has not suspended or terminated a contract and/or called the performance security for a contract for reasons related to Environmental, Social, Health or Safety (ESHS) performance since the date specified in Section 3, Qualification Criteria and Requirements, Sub-Factor 3.2.5.			
<input type="checkbox"/> Declaration of suspension or termination of contract: The following contract(s) has/have been suspended or terminated and/or Performance Security called by an employer(s) for reasons related to Environmental, Social, Health or Safety (ESHS) performance since the date specified in Section 3, Qualification Criteria and Requirements, Sub-Factor 3.2.5. Details are described below:			
Year	Suspended or terminated portion of contract	Contract Identification	Total Contract Amount (current value, currency, exchange rate and USD equivalent)
<i>[insert year]</i>	<i>[insert amount and percentage]</i>	Contract Identification: <i>[indicate complete contract name/ number and any other identification]</i> Name of Employer: <i>[insert full name]</i> Address of Employer: <i>[insert street/city/country]</i> Reason(s) for suspension or termination: <i>[indicate main reason(s)]</i>	<i>[insert amount]</i>

<i>[insert year]</i>	<i>[insert amount and percentage]</i>	Contract Identification: <i>[indicate complete contract name/ number, and any other identification]</i> Name of Employer: <i>[insert full name]</i> Address of Employer: <i>[insert street/city/country]</i> Reason(s) for suspension or termination: <i>[indicate main reason(s)]</i>	<i>[insert amount]</i>
...	...	<i>[list all applicable contracts]</i>	...

Performance Security called by an employer(s) for reasons related to ESHS performance

Year	Contract Identification	Total Contract Amount (current value, currency, exchange rate and USD equivalent)
<i>[insert year]</i>	Contract Identification: <i>[indicate complete contract name/ number, and any other identification]</i> Name of Employer: <i>[insert full name]</i> Address of Employer: <i>[insert street/city/country]</i> Reason(s) for calling of performance security: <i>[indicate main reason(s)]</i>	<i>[insert amount]</i>

Form FIN-3.3.1

Financial Situation and Performance

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

Tenderer's Name: _____

Date: _____

JV Member's Name _____

Tender No. and title: _____

Page _____ of _____ pages

1. Financial Data

Type of Financial information in (currency)	Historic information for previous _____ years, _____				
	(amount in currency, currency, exchange rate*, USD equivalent)				
	Year 1	Year 2	Year 3	Year4	Year 5
Statement of Financial Position (Information from Balance Sheet)					
Total Assets (TA)					
Total Liabilities (TL)					
Total Equity/Net Worth (NW) = TA-TL					
Current Assets (CA)					
Current Liabilities (CL)					
Working Capital (WC) = CA- CL					
Most Recent Working Capital		To be obtained for most recent year and carried forward to FIN - 3.3.3 Line 1; in case of Joint Ventures, to the corresponding Joint Venture Member's FIN -3.3.3.			
Information from Income Statement					

Total Revenue (TR)					
Profits Before Taxes (PBT)					
Cash Flow Information					
Cash Flow from Operating Activities					

*Refer to ITT 15 for the exchange rate

2. Financial Documents

The Tenderer and its parties shall provide copies of financial statements for _____ years pursuant to Section 3, Evaluation and Qualifications Criteria, Sub-factor 3.3.1. The financial statements shall:

- (a) reflect the financial situation of the Tenderer or in case of JV member, and not an affiliated entity (such as parent company or group member);
- (b) be independently audited or certified in accordance with local legislation;
- (c) be complete, including all notes to the financial statements; and
- (d) correspond to accounting periods already completed and audited.

Attached are copies of financial statements² for the _____ years required above; and complying with the requirements

² If the most recent set of financial statements is for a period earlier than 12 months from the date of Tender, the reason for this should be justified.

Form FIN-3.3.2

Average Annual Construction Turnover

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

Tenderer's Name: _____

Date: _____

JV Member's Name _____

Tender No. and title: _____

Page _____ of _____ pages

Annual Turnover Data for the Last ____ Years (Construction Only)			
Year	Amount Currency	Exchange Rate	USD Equivalent
<i>[indicate year]</i>	<i>[insert amount and indicate currency]</i>		
Average Annual Construction Turnover *			

* See Section 3, Evaluation and Qualification Criteria, Sub-Factor 3.3.2.

Form FIN-3.3.3

Financial Resources

Tenderers must demonstrate sufficient financial resources, such as most recent working capital, lines of credit and other financial means (independent of any contractual advance payment), available to meet the Tenderer's financial requirements for (a) its current contract commitments; and (b) the subject contract or contracts as specified in Section 3, Evaluation and Qualification Criteria.

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

Tenderer's Name: _____

Date: _____

JV Member's Name: _____

Tender No. and title: _____

Page _____ of _____ pages

Financial Resources		
No.	Source of financing	Amount (USD equivalent)
1	Most Recent Working Capital (to be taken from FIN – 3.3.1)	
2	Lines of Credit ^a	
3	Other Financial Resources	
Total Available Financial Resources		

^a To be substantiated by a letter from the bank issuing the line of credit.

Form FIN-3.3.4

Current Contract Commitments / Works in Progress

Tenderers and each member to a JV 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 JV, each JV member must fill out this form separately and provide the JV member's name:

Tenderer's Name: _____

Date: _____

JV Member's Name: _____

Tender No. and title: _____

Page _____ of _____ pages

Current Contract Commitments							
No.	Name of Contract	Employer's Contact (Address, Tel, Fax)	Total Contract Value (USD equivalent)	Contract Completion Date	Outstanding Contract Value (USD equivalent) (X) ^a	Remaining Contract Period in Months (Y) ^b	Monthly Financial Resources Requirement (USD equivalent) (X / Y)
1							
2							
3							
4							
5							
Total Monthly Financial Requirement for Current Contract Commitments							

^a Remaining outstanding contract value to be calculated from 28 days prior to the Tender submission deadline (USD equivalent based on the foreign exchange rate as of the same date).

^b Remaining contract period to be calculated from 28 days prior to the Tender submission deadline.

Form FIN-3.3.5

Self-Assessment Tool for Tenderer’s Compliance with Financial Resources (Criterion 3.3.1 of Section 3)

This form requires the same information submitted in Forms FIN-3.3.3 and FIN-3.3.4. All conditions of “Available Financial Resources Net of CCC \geq Requirement for the Subject Contract” must be satisfied to qualify.

Form FIN – 3.3.5A: For Single Entities

For Single Entities: (A)	Total Available Financial Resources from FIN-3.3.3 (B)	Total Monthly Financial Requirement for Current Contract Commitments (CCC) from FIN-3.3.4 (C)	Available Financial Resources Net of CCC $D = (B - C)$	Requirement for the Subject Contract (E)	Results: Yes or No [<i>D must be greater than or equal to E</i>] (F)
_____				
(Name of Tenderer)					

Form FIN – 3.3.5B: For Joint Ventures

For Joint Ventures: (A)	Total Available Financial Resources from FIN-3.3.3 (B)	Total Monthly Financial Requirement for Current Contract Commitments (CCC) from FIN-3.3.4 (C)	Available Financial Resources Net of CCC $D = (B - C)$	Requirement for the Subject Contract (E)	Results: Yes or No [<i>D must be greater than or equal to E</i>] (F)
One Member:					
				

(Name of Member)					
Each Member:					
_____				
(Name of Member 1)					
_____				
(Name of Member 2)					
_____				
(Name of Member 3)					
All members combined	$\sum D =$ Sum of available financial resources net of current contract commitments for all members		$\sum D =$ _____	

Note: Form FIN-3.3.5 is made available for use by the Tenderer as a self-assessment tool, and by the Employer as an evaluation work sheet, to determine compliance with the financial resources requirement as stated in the Criterion 3.3.1. Failure to submit Form FIN-3.3.5 by the Tenderer shall not lead to tender rejection.

Form EXP-3.4.1

General Construction Experience

Tenderer's Name: _____
 Date: _____
 JV Member's Name _____
 Tender No. and title: _____
 Page _____ of _____ pages

Starting Year	Ending Year	Contract Identification	Role of Tenderer
		Contract name: _____ Brief Description of the Works performed by the Tenderer: _____ Amount of contract: _____ Name of Employer: _____ Address: _____	
		Contract name: _____ Brief Description of the Works performed by the Tenderer: _____ Amount of contract: _____ Name of Employer: _____ Address: _____	
		Contract name: _____ Brief Description of the Works performed by the Tenderer: _____ Amount of contract: _____ Name of Employer: _____ Address: _____	

Form EXP-3.4.2(a)

Specific Construction and Contract Management Experience

Tenderer's Name: _____

Date: _____

JV Member's Name _____

Tender No. and title: _____

Page _____ of _____ pages

Similar Contract No.	Information		
Contract Identification			
Award date			
Completion date			
Role in Contract	Prime Contractor <input type="checkbox"/>	Member in JV <input type="checkbox"/>	Subcontractor <input type="checkbox"/>
Total Contract Amount	USD		
If member in a JV or subcontractor, specify participation in total Contract amount			
Employer's Name:			
Address:			
Telephone/fax number			
E-mail:			
Description of the similarity in accordance with Sub-Factor 3.4.2(a) of Section 3:			
1. Amount			
2. Physical size of required works items			
3. Complexity			
4. Methods/Technology			
5. Construction rate for key activities			
6. Other Characteristics			

Form EXP-3.4.2(b)

Construction Experience in Key Activities

Tenderer's Name: _____

Date: _____

Tenderer's JV Member Name: _____

Subcontractor's Name³ (as per ITT 33: _____)

Tender No. and title: _____

Page _____ of _____ pages

All Subcontractors for key activities must complete the information in this form as per ITT 33 and Section 3, Evaluation and Qualification Criteria, Sub-Factor 3.4.2.

1. Key Activity No. One: _____

	Information		
Contract Identification			
Award date			
Completion date			
Role in Contract	Prime Contractor <input type="checkbox"/>	Member in JV <input type="checkbox"/>	Subcontractor <input type="checkbox"/>
Total Contract Amount	USD		
Quantity (Volume, number or rate of production, as applicable) performed under the contract per year or part of the year	Total quantity in the contract (i)	Percentage participation (ii)	Actual Quantity Performed (i) x (ii)
Year 1			
Year 2			
Year 3			
Year 4			

³ If applicable

	Information
Employer's Name:	
Address: Telephone/fax number E-mail:	

	Information
Description of the key activities in accordance with Sub-Factor 3.4.2(b) of Section 3:	

2. Key Activity No. Two _____

3.

Form EXP-3.4.2(c)

Specific Experience in Managing Environmental, Social, Health or Safety (ESHS) Aspects

Availability of a valid ISO Certification as below:

- Quality Management Certificate ISO 9001:2015
- Environmental Management Certificate ISO 14001.2015.
- Occupational Health and Safety Management Certificate ISO 45001:2018.

1. Key Requirement No 1:

Experience in Projects with Significant ESHS Impact

Contract Identification	
Award date	
Completion date	
Role in Contract	
Total Contract Amount	US\$
Details of relevant experience	

2. Key Requirement No 2:

Environmental Management Certificate

Description	Information
Identification of the certificate	
First award date	
Last update of the certificate	
Issuers Name	
Address	
Telephone/fax number	
E-mail	
Compliance with international standards	The certificate is ISO 14001:2015 <input type="checkbox"/> Yes <input type="checkbox"/> No The applicant shall provide a copy of the certificate.
If no, proof of conformity with the international standard by the Applicant	

**3. Key Requirement No 3:
Environmental Management Capacity**

Sr. No.	The Applicant shall demonstrate	Information and Documentation
1	The existence of an Environmental Policy	<i>[Provide relevant details of the Corporate Values or similar policy documents and declarations]</i>
<i>[insert brief description or, if applicable, short abstract of the documentation annexed]</i>		
2	The existence of an Environmental Management System, incl. an adequate organizational set-up for definition, enforcement and monitoring.	<i>[Provide details of the organizational set-up and procedures for relevant issues within your company. If applicable, please specify roles or function in the project team of key ESHS personnel.]</i>
<i>[insert brief description or, if applicable, short abstract of the documentation annexed]</i>		
3	That all members of a JV , suppliers, Subcontractors and temporary workforce a. are aware of and b. comply with the Environmental Management System.	<i>[Provide information on a. how awareness, know how transfer and enforcement is implemented to external partners b. nature, content and frequency of internal trainings to employees.]</i>
<i>[insert brief description or, if applicable, short abstract of the documentation annexed]</i>		

**4. Key Requirement No 4:
Occupational Health and Safety Capacity**

Sr. No.	The Applicant shall demonstrate	Information and Documentation
1	The existence of an Occupational Health & Safety Policy	[
<i>[insert brief description or, if applicable, short abstract of the documentation annexed]</i>		
2	The existence of an H&S management system, incl. an adequate organizational set-up for definition, enforcement and monitoring.	[

Sr. No.	The Applicant shall demonstrate	Information and Documentation
<i>[insert brief description or, if applicable, short abstract of the documentation annexed]</i>		
3	The existence of a training plan that covers relevant H&S requirements.	[
<i>[insert brief description or, if applicable, short abstract of the documentation annexed]</i>		

[Guidance for Form]

For the contracts in 3.4.2(a) above and/or any other contracts [substantially completed and under implementation] as prime Contractor, joint venture member, or Subcontractor, experience in managing ESHS risks and impacts in the following aspects:

- *Details of safety records / statistics in terms of lost time incident frequency and any deaths*
- *Project ESHS Plan used (including Key Performance Indicators and ESHS reporting to Employer)*
- *Organization / Institutional chart and responsibilities for the project with reference to the ESHS aspects*
- *Experience of implementing Site Specific Environmental Management Plans such as:*
 - a. *Site Restoration Plan*
 - b. *Waste Management Plan*
 - c. *Hazardous Waste Management Plan*
 - d. *Traffic Management Plan*
 - e. *Other specific ESHS Plans as per ESIA/ESMP or other E&S instrument*
- *Experience of implementing Site Specific Health and Safety Management Plans*
- *HSE communication tools (the measures taken to spread awareness and communicate hazards & risks at site such as HSE team meetings, safety posters, incident reporting etc.)*
- *ESHS Control Plan for Subcontractors and Suppliers*
- *Emergency Preparedness and Response Plan*
- *Systems for capturing ESHS incidents, accidents and near misses*
- *ESHS Audits Plan*
- *Risk assessment/mitigation plan*
- *Strategy for staff and labor recruitment of temporary workforce and local labor, worker grievance mechanism*
- *Strategy for communication and interaction with stakeholders and local communities*

**Appendix E to Technical Part: Tender Security
Form of Demand Guarantee**

Beneficiary: _____

Tender No: _____

Date: _____

TENDER GUARANTEE No.: _____

Guarantor: _____

We have been informed that _____ (hereinafter called "the Applicant") has submitted or will submit to the Beneficiary its Tender (hereinafter called "the Tender") for the execution of _____ under Tender No. _____.

Furthermore, we understand that, according to the Beneficiary's conditions, Tenders must be supported by a Tender guarantee.

At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ (_____) upon receipt by us of the Beneficiary's complying demand, supported by the Beneficiary's statement, whether in the demand itself or a separate signed document accompanying or identifying the demand, stating that either the Applicant:

- (a) has withdrawn its Tender during the period of Tender validity set forth in the Applicant's Letter of Tender ("the Tender Validity Period"), or any extension thereto provided by the Applicant; or
- (b) having been notified of the acceptance of its Tender by the Beneficiary during the Tender Validity Period or any extension thereto provided by the Applicant, (i) has failed to execute the contract agreement, or (ii) has failed to furnish the Performance Security in accordance with the Instructions to Tenderers ("ITT") of the Beneficiary's Tender Document.

This guarantee will expire: (a) if the Applicant is the successful Tenderer, upon our receipt of copies of the contract agreement signed by the Applicant and the Performance Security issued to the Beneficiary in relation to such contract agreement; or (b) if the Applicant is not the successful Tenderer, upon the earlier of (i) our receipt of a copy of the Beneficiary's notification to the Applicant of the results of the Tendering process; or (ii) twenty-eight days (28) after the end of the Tender Validity Period.

Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758.

[signature(s)]

Form of Tender-Securing Declaration

Date: _____

Tender No.: _____
Alternative No.: _____

To:

We, the undersigned, declare that:

We understand that, according to your conditions, Tenders must be supported by a Tender-Securing Declaration.

We accept that we will automatically be suspended from being eligible for Tendering, or submitting Proposals in any contract with the Employer for the period of time of _____ starting on _____, if we are in breach of our obligation(s) under the Tender conditions, because we:

- (a) have withdrawn our Tender during the period of Tender validity specified in the Letter of Tender; or
- (b) having been notified of the acceptance of our Tender by the Employer during the period of Tender validity, (i) fail or refuse to execute the Contract, if required, or (ii) fail or refuse to furnish the Performance Security in accordance with the instructions to Tenderers ("ITT") of the Employer's Tender documents.

We understand this Tender-Securing Declaration shall expire if we are not the successful Tenderer, upon the earlier of (i) our receipt of your notification to us of the name of the successful Tenderer; or (ii) twenty-eight days (28) after the expiration of our Tender.

Name of the Tenderer* _____

Name of the person duly authorized to sign the Tender on behalf of the Tenderer** _____

Title of the person signing the Tender _____

Signature of the person named above _____

Date signed _____ day of _____,

*: In the case of the Tender submitted by joint venture specify the name of the Joint Venture as Tenderer

** : Person signing the Tender shall have the power of attorney given by the Tenderer attached to the Tender

[Note: In case of a Joint Venture, the Tender-Securing Declaration must be in the name of all members to the Joint Venture that submits the Tender.]

Letter of Tender – Financial Part

INSTRUCTIONS TO TENDERERS: DELETE THIS BOX ONCE YOU HAVE COMPLETED THE DOCUMENT

The Tenderer must prepare this Letter of Tender on stationery with its letterhead clearly showing the Tenderer's complete name and business address.

Note: All italicized text is to help Tenderers in preparing this form.

Date of this Tender submission: *[insert date (as day, month and year) of Tender submission]*

Tender No.: *[insert tender reference number]*

Alternative No.: *[insert reference number if this is a Tender for an alternative]*

To General Manager (P&CA)

National Highway Authority

28-Mauve Area, Sector: G-9/1

2nd Floor, Room No. 223

City: Islamabad

ZIP Code: 44000

Country: Pakistan

Telephone: 00-92-51-9032727

Fax: 00-92-51-9260419

E-mail: gmpca.nha@gmail.com & gmpca@nha.gov.pk

We, the undersigned, hereby submit the second part of our Tender, the Tender Price and Bill of Quantities. This accompanies the Letter of Tender – Technical Part.

In submitting our Tender, we declare that:

- (a) **Tender Validity Period:** Our Tender shall be valid for the period specified in TDS 18.1 (as amended, if applicable) from the date fixed for the Tender submission deadline specified in TDS 22.1 (as amended, if applicable), and it shall remain binding upon us and may be accepted at any time before the expiration of that period
- (b) **Tender Price:** The total price of our Tender, excluding any discounts offered in item (c) below is: *[Insert one of the options below as appropriate]*

Option 1, in case of one lot: Total price is: *[insert the total price of the Tender in words and figures, indicating the various amounts and the respective currencies];*

Or

Option 2, in case of multiple lots: (a) Total price of each lot *[insert the total price of each lot in words and figures, indicating the various amounts and the respective currencies];* and (b) Total price of all lots (sum of all lots) *[insert the*

total price of all lots in words and figures, indicating the various amounts and the respective currencies];

(c) **Discounts:** The discounts offered and the methodology for their application are:

(i) The discounts offered are: *[Specify in detail each discount offered.]*

(ii) The exact method of calculations to determine the net price after application of discounts is shown below: *[Specify in detail the method that shall be used to apply the discounts].*

(d) **Commissions, Gratuities, Fees:** We have paid, or will pay the following commissions, gratuities, or fees with respect to the Tendering process or execution of the Contract: *[insert complete name of each Recipient, its full address, the reason for which each commission or gratuity was paid and the amount and currency of each such commission or gratuity]*

Name of Recipient	Address	Reason	Amount

(If none has been paid or is to be paid, indicate “none.”)

Name of the Tenderer: * *[insert complete name of person signing the Tender]*

Name of the person duly authorized to sign the Tender on behalf of the Tenderer: ***[insert complete name of person duly authorized to sign the Tender]*

Title of the person signing the Tender: *[insert complete title of the person signing the Tender]*

Signature of the person named above: *[insert signature of person whose name and capacity are shown above]*

Date signed *[insert date of signing]* **day of** *[insert month]*, *[insert year]*

*: In the case of the Tender submitted by joint venture specify the name of the Joint Venture as Tenderer

** : Person signing the Tender shall have the power of attorney given by the Tenderer. The power of attorney shall be attached with the Letter of Tender.

Appendix A to Financial Part Schedule of Cost Indexation

The formulae for price adjustment shall be of the following type

$$P_n = a + b \frac{L_n}{L_o} + c \frac{E_n}{E_o} + d \frac{M_n}{M_o} + \dots$$

where:

“P_n” is the adjustment multiplier to be applied to the estimated contract value in the relevant currency of the work carried out in period “n”, this period being a month unless otherwise stated in the Contract Data;

“a” is a fixed coefficient, stated in the relevant table of adjustment data, representing the non-adjustable portion in contractual payments;

“b”, “c”, “d”, ... are coefficients representing the estimated proportion of each cost element related to the execution of the Works as stated in the relevant table of adjustment data; such tabulated cost elements may be indicative of resources such as labor, equipment and materials;

“L_n”, “E_n”, “M_n”, ... are the current cost indices or reference prices for period “n”, expressed in the relevant currency of payment, each of which is applicable to the relevant tabulated cost element on the date forty-nine (49) days prior to the last day of the period (to which the particular Payment Certificate relates); and

“L_o”, “E_o”, “M_o”, ... are the base cost indices or reference prices, expressed in the relevant currency of payment, each of which is applicable to the relevant tabulated cost element on the Base Date.

The cost indices or reference prices stated in the Table of Adjustment Data shall be used. If their source is in doubt, it shall be determined by the Engineer. For this purpose, reference shall be made to the values of the indices at stated dates (quoted in the fourth and fifth columns respectively of the table).

If the currency in which the Contract price is expressed is different from the currency of the country of origin of the indices, a correction factor will be applied to avoid incorrect adjustments of the Contract price. The correction factor shall be: Z_0 / Z_1 , where,

Z_0 = the number of units of currency of the origin of the indices which equal to one unit of the currency of the Contract Price on the Base date, and

Z_1 = the number of units of currency of the origin of the indices which equal to one unit of the currency of the Contract Price on the Date of Adjustment.

Table of Adjustment Data

Table A: Local Currency

WIDENING & IMPROVEMENT OF PRIORITY SECTIONS OF N-5 (PHASE-1), 210 KM SECTION-7
RAWALPINDI - HASSANADAL ROAD 40 KM
SCHEDULE OF SPECIFIED MATERIALS
FOR CONTRACT PRICE ADJUSTMENT
CLAUSE 70-COC (PART-II)
TABLE OF BASIC PRICES

Item No.	Description	Representative Entity of Specified Material	Source of Index	Unit	Value of Factor "C"
1	Fixed Portion				0.530
2	Fuel	High Speed Diesel	Pakistan State Oil / Pakistan Bureau of Statistics	Liter	0.090
3	Labour	Unskilled	Pakistan Bureau of Statistics (District Rawalpindi)	Per Day	0.030
4	Steel	Iron Bar (M.S. Bar) 1/2"	Pakistan Bureau of Statistics (District Rawalpindi)	Metric Ton	0.140
5	Cement	Ordinary Potland Cement	Pakistan Bureau of Statistics (District Rawalpindi)	Per Bag	0.050
6	Bitumen	Grade 60/70 (in Bulk)	Attock Petroleum Limited, (EX- NRL) Karachi	Metric Ton	0.160
					1.00

Note:-

- 1- The Base prices of Specified Materials shall be as of actual prevailing on the date falling on 28 days prior to date of submission of Bids (inclusive all kinds of taxes and duties that can be levied at the source) and shall be obtained from the respective sources, and to be verified and notified by the Engineer after the consent of the Employer.
- 2- The current price are meant to be ex-factory prices (inclusive all kinds of taxes and duties that can be levied at the source) 28 days prior to submitted date of IPC. (Price adjustment shall be processed monthwise).
- 3- Adjustment of increase / decrease shall only be admissible for the materials listed above.
- 4- Value of work done for price adjustment shall be value of permanent works (Excluding Provisional Sums and Bill no 07 ;General Items)
- 5- All amounts in Pak Rupees only.



Table B: Foreign Currency (FC)

Name of Currency: [if the Tenderer is allowed to receive payments in foreign currency (USD) this table shall be used.]

Index Code	Index Description	Source of Index	Base Value and Data	Tenderer's Currency in Type/Amount	Equivalent in FC-1	Tenderer's proposed Weighting
A	Nonadjustable	-	-	-		A. 0.7*
B	Labour (Expatriate)					B. ____* (0.1- 0.15)
C	Miscellaneous Material(imported)					C. ____* (0.05-0.09)
D	Provision & Maintenance of Contractor's Equipment & Plant					D. ____* (0.08-0.1)
				Total		1.00

[* to be entered by the Employer. Whereas "A" should be a fixed percentage, B,C,D and E should specify a range of values and the Tenderer will be required to specify a value within the range such that the total weighting = 1.00]

- i. The bidder shall specify the Name of Index Code, Source of Index and title of publication.
- ii. The base cost indices or prices shall be those for the month falling 28 days prior to the latest day of submission of bids. Current indices or reference prices for period "n", is applicable to the relevant tabulated cost element for the month following 49 days prior to the last day of the period(to which particular Payment Certificate relates).

[Note: If Bidder failed to provide information regarding Weightings, Base Value and Source of Index, then it is deemed that the Contractor has foregone his right to claim price adjustment in Foreign Currency.]

Table C. Summary of Payment Currencies

For [insert name of Section of the Works]

Name of Payment Currency	A	B	C	D
	Amount of Currency	Rate of Exchange (local currency per unit of foreign)	Local Currency Equivalent $C = A \times B$	Percentage of Net Tender Price (NTP) $\frac{100 \times C}{NTP}$
Local currency <u>PKR</u>		1.00		
Foreign Currency <u>USD</u>				
Net Tender Price				100.00
Provisional Sums Expressed in Local Currency	419,220,000		419,220,000	
TOTAL TENDER PRICE (including provisional sums)				

Appendix-B to Financial Part: Bill of Quantities

A. Preamble

1. The Bill of Quantities shall be read in conjunction with the Instructions to Tenderers, General and Particular Condition of Contract, Technical Specification and Drawings.
2. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for tendering. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices Tender in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix within the terms of the Contract.
3. The rates and prices in the priced Bill of Quantities shall, except insofar as it is otherwise provided under the Contract, include all constructional plant, labour, supervision, materials, erection, maintenance, 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 Cost, as on the date 28 days prior deadline for submission of Tenderers, shall be included in the rates and prices and the total tender price submitted by Tenderer
4. A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of Items against which the Contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.
5. The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the priced Bill 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 Work.
6. General directions and descriptions of work and materials are not necessarily repeated nor summarized in the Bill of Quantities. References to the relevant sections of the Contract documentation shall be made before entering prices against each item in the priced Bill of Quantities.
7. Provisional Sums included and so designated in the Bill of Quantities shall be expended in whole or in part at the direction and discretion of the Engineer in accordance with Sub-Clause 13.5 and Clause 13.6 of the General Conditions of Contract.
8. The “Ref Specs” mentioned in the Bill of Quantities indicates the technical Specifications Section number(s) which are to be followed during execution of items of works in accordance with the applicable drawings.

9. Unless Otherwise stated in the text of the priced Bill of Quantities, the quantities have to be measured and paid in accordance with the measurement and Payment Clauses given in the relevant Technical Specifications or in accordance with implied meaning of the specification. Any special method of measurement stated in the text of priced Bill of Quantities is limited to the concerned items only.
10. All rates and amounts are in Pakistani Rupees. For the purpose of clarity, it is elaborated regarding serial no. 03 of Preamble to this Bill of Quantities, the Contractor is expected to consider all applicable, provincial and federal, direct and indirect taxes, Bill of Quantities for example: Provincial Sales Tax, General Sales Tax (GST), Duties, in accordance with the relevant laws of Pakistan, in their rates against each item of the Levies etc.
11. Note: The bid price is inclusive of all Environmental, Health and Safety management and compliance cost.
12. Arithmetic errors will be corrected by the Employer as follows:
 - a) If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Employer there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected.
 - b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail, and the total shall be corrected.
 - c) If there is a discrepancy between the bid price in the Summary of Bill of Quantities and the bid amount in item (c) of the Letter of Bid, the bid price in the Summary of Bill of Quantities will prevail and the bid amount in item (c) of the Letter of Bid will be corrected
 - d) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a), (b), and (c) above.
13. Rock is defined as all materials that, in the opinion of the Engineer, require the use of metal wedges and sledgehammers, or the use of compressed air drilling for their removal, and that cannot be extracted by ripping with a tractor of at least 150 brake horsepower with a single, rear-mounted, heavy-duty ripper.
- 14.- The Contractor shall submit the DAAB members' invoices and satisfactory evidence of having paid 100% of such invoices as part of supporting documents of those Statements submitted under Sub-Clause 14.3 [Application for Interim Payment). No overhead and profit shall be paid to the Contractor in this respect. The Employer's share (50%) in this regard shall be reimbursed to the Contractor

in the interim payment certificate. Alternately, the Employer may decide to include the DAAB member's fees and expenses under Provisional Sums for contingency.

B. Work Items

1. The Bill of Quantities (BOQs) are attached.
2. Tenderers shall price the Bill of Quantities in Pakistani Rupees only.



FRIENDLY HIGHWAYS

**NATIONAL HIGHWAY AUTHORITY
GOVERNMENT OF PAKISTAN**



**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY,
REHABILITATION AND RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)**

PHASE I-A (141KM)

SECTION-7 : RAWALPINDI HASSANABDAL ROAD (40 KM)

BIDDING DOCUMENTS

BILL OF QUANTITIES



NATIONAL ENGINEERING SERVICES PAKISTAN (PVT) LIMITED

NESPAK HOUSE, 1-C, Block N, Model Town Extension, P.O. Box 1351, Lahore – Pakistan

**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY,
REHABILITATION AND RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)
BILL OF QUANTITIES
SUMMARY**

Bill No.	Description	Amount (Rs.)
1	EARTH WORK AND ALLIED ACTIVITIES	
2	SUB BASE & BASE	
3	SURFACE COURSES AND PAVEMENT	
4.1	STRUCTURES (RIGID PAVEMENT)	
4.2	STRUCTURES (BRDIGES)	
4.3	STRUCTURES (CULVERTS)	
4.4	STRUCTURES (PEDESTRIAN BRIDGES)	
4.5	STRUCTURES (RETAINING WALLS)	
4.6	STRUCTURES (FLYOVER)	
5	DRAINAGE AND EROSION WORKS	
6	ANCILLARY WORKS	
7	GENERAL ITEMS	
8	ELECTRICAL WORKS	
9	TOLL PLAZA (P.S)	200,000,000
10	WEIGH STATIONS (P.S)	200,000,000
	Total Construction Cost =	

Rupees _____



**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)**

PHASE I-A (141 KM)

SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)

BILL OF QUANTITIES

BILL NO. 1 : EARTH WORK

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
101	Clearing and Grubbing	S.M	286,450			
102a	Removal of Trees 150-300 mm Girth	Each	400			
102b	Removal of Trees 301-600 mm Girth	Each	300			
102c	Removal of Trees 601mm or over Girth	Each	300			
104	Compaction of Natural Ground	S.M	286,450			
106c	Excavate Surplus Common Material	C.M	46,780			
108a	Formation of Embankment from Roadway Excavation in Common Material	C.M	180,470			
108d	Formation of Embankment from Structural Excavation in Common Material	C.M	43,801			
109a	Subgrade Preparation in Earth Cut	S.M	561,363			
TOTAL FOR BILL NO.1 CARRIED TO SUMMARY						

**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)
BILL OF QUANTITIES**

BILL NO. 2 : SUBBASE & BASE

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
201	Granular Subbase	C.M	118,967			
201b	Reuse of Broken / Salvaged Granular Material from existing road as Sub-base	C.M	132,970			
202i	Aggregate Base Course with Paver (Graded through Pugmill)	C.M	371,701			
203b	Asphaltic Base Course Plant mix (Class B)	C.M	222,144			
209a	Breaking of Existing Road Pavement Structure	C.M	274,205			
209b	Scarification of Existing Road Pavement	S.M	1,100			
SP-210	Preparation of Exposed Aggregate Base Course Surface Layer	C.M	106,364			
TOTAL FOR BILL NO.2 CARRIED TO SUMMARY						



**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)
BILL OF QUANTITIES**

BILL NO. 3 : SURFACE COURSES & PAVEMENT

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
302a	Cut -Back Asphalt for Bituminous Prime Coat	S.M	648,426			
303a	Cut -Back Asphalt for Bituminous Tack Coat	S.M	2,514,207			
304ci	Triple Surface Treatment	S.M	195,630			
305a	Asphaltic Concrete for Wearing Course (Class "A")	C.M	68,620			
TOTAL FOR BILL NO.3 CARRIED TO SUMMARY						



**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)
BILL OF QUANTITIES**

Bill No.4.1 Structure (Rigid Pavement)

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
401a3ii	Concrete Class A3 (4000 PSI)	CM	20,916.00			
401 f	Lean Concrete	CM	5,230.00			
404b	Reinforcement as per AASHTO M-31 Grade 60	Ton	320.00			
406a	Premoulded Joint Filler 12 mm thick with Bitumastic Joint Seal	S.M	310.00			
SP-413	Supplying and laying polythene sheet over D.P.C. under floors and on roofs, etc. ii) 500 gauge (.005" thick)	S.M	52,103.62			
SP-414	Rebar Chemical Anchoring for new and old Structure	Each	1,372.00			
TOTAL FOR BILL NO.4.1 CARRIED TO SUMMARY						



**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)**

PHASE I-A (141 KM)

SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)

BILL OF QUANTITIES

BILL NO. 4.2 : STRUCTURES (BRIDGES)

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
107cii	Structural Excavation In Medium Rock Material	CM	2,126.00			
107e	Common Backfill	CM	299.00			
401a1ii	Concrete Class A1 On Ground (Approach Slab)	CM	140.00			
401a3iii	Concrete Class A3 Elevated (Transom, Deck Slab, Diaphragm , Wing Walls ,Curtain wall , Abutment Cap & NJ Barrier, Piers	CM	1,871.07			
401a3i	Concrete Class A3 (Underground) Piles	CM	3,115.00			
401a3ii	Concrete Class A3 (Onground) Pilecap	CM	1,479.00			
401giv	Precast Concrete Class D1 Precast Girder	CM	385.00			
401f	Lean concrete	CM	112.00			
404b	Reinforcement As Per AASHTO M.31 Grade 60	Tons	1,405.00			
405a	Pre-Stressing Wire Strand 3/8" -1/2" Dia Complete in all Respect	Tons	26.00			
405b	Launching girders	Tons	922.00			
406eii	Elestomeric Bearing Pad According to size and thickness Imported (Europen / USA MAKE)	Cu.cm	460,944.00			



**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)
BILL OF QUANTITIES**

BILL NO. 4.2 : STRUCTURES (BRIDGES)

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
406cii	Expansion Joint with Two Extruded Aluminium Alloy Section for 50mm Movement (USA/EU MAKE)	LM	135.00			
407 diii	Cast in place Piles > 0.8 m upto 1 m dia in Normal Soil (Boring only)	LM	2,775.00			
407div	Cast in place Piles > 0.8 m upto 1 m dia in Gravel Strata (Boring only)	LM	1,190.00			
509 d	Grouted Riprap Class "A"	CM	640.00			
407t	Pile Load Test Upto 800 Ton	Each	5.00			
SP-415	Sonic Integrity Tests (SIT) on all Piles	Each	120.00			
SP-416	GI Drain Pipe Dia 100 mm	LM	65.00			
510	Dismantling of Structures and Obstructions	CM	106.00			
SP-414	Rebar Chemical Anchoring for new and old Structure	Each	699.00			
SP-418	Removal of rust from exposed steel bars, application of protective coating and pressurized epoxy grouting for existing damage concrete with fair surface finished	Sq.m	275.00			
TOTAL FOR BILL NO.4.2 CARRIED TO SUMMARY						

**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)
BILL OF QUANTITIES**

BILL NO. 4.3 : STRUCTURES (CULVERTS)

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
107 a	Structural Excavation in Common Material	CM	3,287.00			
107d	Granular Backfill	CM	754.00			
401 a3i	Concrete Class A3 (Underground)	CM	6.00			
401a3ii	Concrete Class A3 (On Ground)	CM	252.00			
401a3iii	Concrete Class A3 (Elevated)	CM	664.00			
401 f	Lean Concrete	CM	95.00			
404 b	Reinforcement as per AASHTO M-31 Grade 60	TON	111.00			
406a	Premoulded Joint Filler (12 mm thick) With Bitumastic Joint Seal	SM	2.00			
406 dii	PVC Waterstop 8" Size (12 mm thick)	LM	1,075.00			
509d	Grouted Riprap Class A	CM	18.00			
TOTAL FOR BILL NO.4.3 CARRIED TO SUMMARY						

**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)
BILL OF QUANTITIES**

BILL NO. 4.4 : STRUCTURES (PEDESTRIAN BRIDGES)

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
107a	Structural Excavation In Common Material	CM	5,481.00			
107d	Granular Backfill	CM	8,484.00			
401a1ii	Concrete Class A1 (On Ground) - Spread Footings	CM	598.00			
401a1ii	Concrete Class A1 (On Ground) - Padestal	CM	113.00			
401a1ii	Concrete Class A1 (On Ground) - Beam B-1	CM	69.00			
401f	Lean Concrete	CM	145.00			
404b	Reinforcement as per AASHTO M-31 Grade-60	TON	130.00			
404h	Reinforcement (Structural Shapes) as per ASTMA-36	TON	1,051.00			
SP-419	Painting	SM	13,195.00			
SP-420	Steel Hand Railing	LM	2,387.00			
TOTAL FOR BILL NO.4.4 CARRIED TO SUMMARY						

**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)
BILL OF QUANTITIES**

BILL NO. 4.5 : STRUCTURES (RETAINING WALLS)

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
107a	Structural Excavation In Common Material	CM	41,772.00			
107d	Granular Backfill	CM	26,598.00			
401a3iii	Concrete Class "A3" (Elevated)	CM	3,343.00			
401a3ii	Concrete Class "A3" (On Ground)	CM	5,586.00			
401f	Lean Concrete	CM	929.00			
404b	Reinforcement as per AASHTO M-31 Grade-60	TON	1,295.00			
406a	Premoulded Joint Filler 12 mm thick with Bitumastic Joint Seal	SM	259.00			
406dii	PVC Water Stops 8" size (12 mm thick)	LM	6,200.00			
SP-417	Bitumen coating to plastered or cement concrete surface:-	SM	16,740.00			
TOTAL FOR BILL NO.4.5 CARRIED TO SUMMARY						



RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)

PHASE I-A (141 KM)

SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)

BILL OF QUANTITIES

BILL NO. 4.6 : STRUCTURES (FLYOVER)

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
107a	Structural Excavation in common Material	CM	9,613.00			
107d	Granular Back Fill	CM	4,180.00			
401 a1ii	Concrete Class 'A1' (ON GROUND) Approach Slab, Barrier	CM	1,353.00			
401 a3iii	Concrete Class 'A3' (ELEVATED) Pier, Transom, Deck Slab, Diaphragm & Wing Walls	CM	13,368.00			
401 a3i	Concrete Class 'A3' (UNDERGROUND) Piles	CM	24,892.00			
401 giv	Precast Concrete Class D1	CM	13,940.00			
401 f	Lean Concrete	CM	331.00			
404 b	Reinforcement as per AASHTO M 31 Grade 60.	Tons	8,016.00			
404 h	Reinforcement (Structural Shapes) as per ASTM A-36.	Tons	24.00			
405 a	Prestressing Wire Strand, 3/8" - 1/2" dia. Complete in all respects	Tons	697.00			
405 b	Launching of Girder	Tons	33,510.00			



**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)
BILL OF QUANTITIES**

BILL NO. 4.6 : STRUCTURES (FLYOVER)

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
406 ei	Elastomeric Bearing Pads (According to size & thickness)- USA/EU Make	Cu.cm	12,022,560			
407 diii	Cast in place Piles > 0.8 m upto 1 m dia in Normal Soil (Boring only)	LM	330.00			
407 div	Cast in place Piles > 0.8 m upto 1 m dia in Gravel Strata (Boring only)	LM	495.00			
407 dv	Cast in place Piles > 1 m upto 1.5 m dia in Normal Soil (Boring only)	LM	5,175.00			
407 dvi	Cast in place Piles > 1 m upto 1.5 m dia in Gravel Strata (Boring only)	LM	7,762.00			
407v	Pile Load Test upto 1200 Ton	Each	1.00			
407s	Proof Load Test upto 550 Ton	Each	1.00			
SP-415	Sonic Integrity Tests (SIT) on all Piles	Each	904.00			
406cii	Expansion Joint with Two Extruded Aluminium Alloy Section for 50mm Movement (USA/EU MAKE)	M	747.00			
SP-416	GI Drain Pipe Dia 100 mm	LM	608.00			
	TOTAL FOR BILL NO.4.6 CARRIED TO SUMMARY					



**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)
BILL OF QUANTITIES**

BILL NO. 5 : DRAINAGE AND EROSION WORKS

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
107 a	Structural Excavation in Common Material	CM	10,722.00			
107d	Granular Backfill	CM	847.00			
401a1ii	Concrete Class A1 (On Ground) - Base Slab	CM	1,468.00			
401a1iii	Concrete Class A1 (Elevated) - Side Walls & Roof Slab	CM	3,499.00			
401 f	Lean Concrete	CM	551.00			
404 b	Reinforcement as per AASHTO M-31 Grade 60	TON	601.00			
406a	Premoulded Joint Filler 12 mm Thick with Bitumastic Joint Seal	S.M	245.00			
406 dii	PVC Waterstop 8" Size (12 mm thick)	LM	12,979.00			
SP-417	Bitumen coating to plastered or cement concrete surface:-	SM	10,158.00			
SP-421	Providing and fixing, MS grating (1' x 4") using angle iron frame (L 1-1/2" X 1-1/2" X 3/16") fitted with 1/2" sq. bar welded with frame at 2" c/c complete in all respects.	Each	283.00			
510	Dismantling of Structure and Obstruction	C.M	15,381			
TOTAL FOR BILL NO.5 CARRIED TO SUMMARY						



**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)**

PHASE I-A (141 KM)

SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)

BILL OF QUANTITIES

BILL NO. 6 : ANCILLARY WORKS

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
401b	Concrete Class "B" in haunches around PVC pipes placed across the road for future duct	C.M	230			
601di	Precast Curb in Concrete Class A-1 of size 450 x 150 mm Incl. Bedding & Haunching	M	123,968			
SP-616	RCC New Jersey Barrier (In-Situ) Single Face 1010 mm high (Incl. Reinforcement)	M	51,810			
607aiii	Traffic Sign Cat 1iii - 120 cm Sign Board in High Intensity Reflective Sheet Laminated on 1.8 mm thick G.I Sheet with G.I Pipe dia 3" and thickness 8 Gauge	Each	50			
607biii	Traffic Sign Cat 2iii - 120 Cm Sign Board In High Intensity Reflective Sheet Laminated On 1.8 Mm Thick G.I Sheet With G.I Pipe Dia 3" And Thickness 8 Gauge	Each	50			
607ei	Traffic Road Sign Category 3c (Up to 3 Sq.m) - Sign Board in High Intensity Reflective Sheet Laminated on 1.8 mm thick G.I Sheet with G.I Pipe Dia 4" and thickness 8 Gauge	S.M	200			
607eiii	Traffic Road Sign Category 3C (Up to 10 Sq.m)-Sign board in high Intensity Reflective Sheet Laminated on 1.8 mm thick G.I sheet with G.I pipe dia 6" thickness as per Schedule 40	S.M	150			
607fi	Additional Panel size 60 cm X 30 cm Sign Board in High Intensity Reflective Sheet Laminated on 1.8 mm Thick G.I Sheet	Each	100			



**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)
BILL OF QUANTITIES**

BILL NO. 6 : ANCILLARY WORKS

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
607gi	Additional Panel size 90 cm X 30 cm Sign Board in High Intensity Reflective Sheet Laminated on 1.8 mm Thick G.I Sheet	Each	100			
608 h2	Pavement Marking in Reflective TP Paint for line of 15cm width	M	288,723			
608 j2	Pavement Marking in Reflective TP Paint for 4m Arrows	Each	55			
609ci	Reflectorised Plastic Pavement Stud (Raised Profile Type - Single) 100 mm X100 mm	Each	43,785			
SP-617	PVC Pipe 150mm dia	M	2,520			
SP-618	Providing and laying Tuff pavers, having 7000 PSI, crushing strength of approved manufacturer, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope complete in all respect. b). 60mm	SM	112,953			
SP-615a	Gantry Sign Type-I as shown on drawing	Each	6			
SP-615b	Gantry Sign Type-II as shown on drawing	Each	6			
TOTAL FOR BILL NO. 6 CARRIED TO SUMMARY						



**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)
BILL OF QUANTITIES**

BILL NO. 7 : GENERAL ITEMS

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
SP-701a	Provide Surveying & allied instruments	PS	-			2,500,000
SP-701b	Maintain Survey Instruments, Including 2no. Helpers.	Month	24			
SP-702a	Provide the Employer's and Engineer's Representative's Office & Residence	PS	-			7,200,000
SP-702b	Furnish and Equip. Employer's & Engineer's Representative office & Residence.	PS	-			2,500,000
SP-702c	Maintain Employer's and Engineer's Representative office and Residence.	Month	24			
SP-703a	Provide Material Testing Project Laboratory	PS	-			2,000,000
SP-703b	Equip & Furnish Material Testing Project Laboratory.	PS	-			5,000,000
SP-703c	Maintain Material Testing Project Laboratory (1 No. including 2 No Helpers)	Month	24			
SP-705	Detour Roads and Maintenance of Traffic. Not a separate payable item. Cost shall be deemed to have included in other items of works.				As per Requirement	-
SP-706	Traffic Control Devices during Construction. Not a separate payable item. Cost shall be deemed to have included in other items of works.				As per Requirement	-

**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)
BILL OF QUANTITIES**

BILL NO. 7 : GENERAL ITEMS

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
SP-708a	Provide Employer's Representative's Transport					
	(i) 4x4 Double Cabin 2800cc with A/C	Each	1			
	(ii) Car 1800cc With A/C	Each	1			
SP-708 b	Provide Engineer's Representative Transport.					
	(i) 4x4 Double Cabin 2800cc with A/C	Each	2			
	(ii) MPV 1000cc with A/C	Each	2			
SP-708c	Running & Maintenance of Employer's & Engineer's Representative's Transport	Vehicle Month	144			
SP-709	Employing Trainee Engineer with boarding, lodging and messing with the approval of Member Planning NHA (4 Nos.)	Month	96			
SP-710	Deployment of Quantity Surveyor in Design Section at NHA Headquarter having minimum experience of 10 years with the approval of Member Planning NHA (1 No.)	Month	24			
TOTAL FOR BILL NO. 7 CARRIED TO SUMMARY						

* Vehicles will only be purchased subject to the clearance from Austerity Committee.



**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)
BILL OF QUANTITIES**

BILL NO. 8 : ELECTRICAL WORKS

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
	Design, supply, transportation, storage, installation, testing and commissioning of the following items of work, including all material, labour, tools and accessories etc. required for proper completion of each item as per specification, drawings and/or as directed by the Engineer.					
801(a)	10 m high single bent arm conical octagonal galvanized steel pole with extension arm luminaire arrangement, base plate, J-rag bolts, 01 No. 2 Amp 10kA SP MCB, pole numbering and earthing etc. as shown on drawing.	Each	5			
801(b)	10 m high double bent arm conical octagonal galvanized steel pole with extension arm luminaire arrangement, base plate, J-rag bolts, 02 Nos. 2 Amp 10kA SP MCB, pole numbering and earthing etc. as shown on drawing.	Each	5			
801(c)	12 m high single bent arm conical octagonal galvanized steel pole with extension arm luminaire arrangement, base plate, J-rag bolts, 01 No. 2 Amp 10kA SP MCB, pole numbering and earthing etc. as shown on drawing.	Each	570			
801(d)	12 m high double bent arm conical octagonal galvanized steel pole with extension arm luminaire arrangement, base plate, J-rag bolts, 02 Nos. 2 Amp 10kA SP MCB, pole numbering and earthing etc. as shown on drawing.	Each	85			
801(e)	Road Lighting Pole Foundation	Each	665			



RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)

PHASE I-A (141 KM)

SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)

BILL OF QUANTITIES

BILL NO. 8 : ELECTRICAL WORKS

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
	Road Lights & Accessories for Flood Light Installation					
802(a)	Road Lighting LED Luminaries 90W make Signify (Philips), Schreder, Tungsram (GE) or equivalent suitable for M-2 & M-3 roads of wattage suitable for the project requirements, fully IP 66 with corrosion resistant die cast aluminum housing, silicon gas kit, thermally hardened glass complete with LED drivers, surge protection and all accessories/ components required for the proper operation of the system. The luminaries shall be fully flexible for future upgrades and easy replacements for maintenance purposes. Contractor to submit lighting design calculation as per the offered light fixtures.	No.	5			
802(b)	Road Lighting LED Luminaries 120W make Signify (Philips), Schreder, Tungsram (GE) or equivalent suitable for M-2 & M-3 roads of wattage suitable for the project requirements, fully IP 66 with corrosion resistant die cast aluminum housing, silicon gas kit, thermally hardened glass complete with LED drivers, surge protection and all accessories/ components required for the proper operation of the system. The luminaries shall be fully flexible for future upgrades and easy replacements for maintenance purposes. Contractor to submit lighting design calculation as per the offered light fixtures.	No.	755			
802(c)	Road Lighting LED Luminaries 150W make Signify (Philips), Schreder, Tungsram (GE) or equivalent suitable for M-2 & M-3 roads of wattage suitable for the project requirements, fully IP 66 with corrosion resistant die cast aluminum housing, silicon gas kit, thermally hardened glass complete with LED drivers, surge protection and all accessories/ components required for the proper operation of the system. The luminaries shall be fully flexible for future upgrades and easy replacements for maintenance purposes. Contractor to submit lighting design calculation as per the offered light fixtures.	No.	5			



**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)**

PHASE I-A (141 KM)

SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)

BILL OF QUANTITIES

BILL NO. 8 : ELECTRICAL WORKS

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
802(d)	Road Lighting LED Luminaries 180W make Signify (Philips), Schreder, Tungsram (GE) or equivalent suitable for M-2 & M-3 roads of wattage suitable for the project requirements, fully IP 66 with corrosion resistant die cast aluminum housing, silicon gas kit, thermally hardened glass complete with LED drivers, surge protection and all accessories/ components required for the proper operation of the system. The luminaries shall be fully flexible for future upgrades and easy replacements for maintenance purposes. Contractor to submit lighting design calculation as per the offered light fixtures.	No.	5			
802(e)	Flood Lighting LED Luminaries 120W make Signify (Philips), Schreder, Tungsram (GE) or equivalent suitable for M-2 & M-3 roads of wattage suitable for the project requirements, fully IP 65 with corrosion resistant die cast aluminum housing, silicon gas kit, thermally hardened glass complete with LED drivers, surge protection and all accessories/ components required for the proper operation of the system. The luminaries shall be fully flexible for future upgrades and easy replacements for maintenance purposes. Contractor to submit lighting design calculation as per the offered light fixtures.	No.	20			
802(f)	Hot dipped galvanized bracket for mounting of Flood lights alongwith all accessories.	Each	20			

**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)**

BILL OF QUANTITIES

BILL NO. 8 : ELECTRICAL WORKS

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
802(g)	Junction box size 12"x08"x06" (for Flood Light connection) with angle iron frame clad 16 SWG, sheet steel enclosure having high quality powder coated paint, color RAL 7032. suitable for connections with IP 54 protection class, door, locking arrangement etc. and all other accessories as required for quality work.	No.				
-	Junction box size 12"x08"x06" (for Flood Light connection)					
-	01 No. 2 Amp. SP MCB, 10 kA					
-	04 No. Terminal block					
-	GI flexible pipe 1" dia					
	Conduits / Pipes					
803(a)	PVC pipe/conduit Class-D 50 mm dia with accessories suitable for laying multi-core cables in wall/structure.	Rm				
803(b)	PVC pipe/conduit Class-D 100 mm dia with accessories suitable for laying multi-core cables on road crossings.	Rm				
803(c)	PVC pipe/conduit Class-B 100 mm dia with accessories suitable for laying multi-core cables from pole to pole.	Rm				
	Low Voltage Power Cables					
804 (a)	4 Core 25mm ² Cu. PVC/PVC 600/1000 Voltage grade Unarmored Cable (Tranformer to LCP) (Imported copper shall be used. Verified documentary evidence for source of copper & PVC shall be furnished prior to manufacturing)	Rm	1,000			



**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)
BILL OF QUANTITIES**

BILL NO. 8 : ELECTRICAL WORKS

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
804 (b)	1 Core 25 mm ² Cu. PVC 450/750 Voltage grade earth cable including all fixing accessories as required for earthing of lighting control panels.	Rm	400			
804(c)	4 Core 16mm ² Cu. PVC/PVC 600/1000 Voltage grade Unarmored Cable (Imported copper shall be used. Verified documentary evidence for source of copper & PVC shall be furnished prior to manufacturing)	Rm	25,000			
804 (d)	1 Core 16mm ² Cu. PVC 450/750 Voltage grade Unarmored Cable (Imported copper shall be used. Verified documentary evidence for source of copper & PVC shall be furnished prior to manufacturing)	Rm	26,000			
804(e)	3 Nos. 1 core 2.5 mm ² Cu. PVC 450/750 Voltage grade cable (stranded conductor) (Imported copper shall be used. Verified documentary evidence for source of copper & PVC shall be furnished prior to manufacturing) from junction box to the fitting through the hollow of pole.					
i	For 10m Pole	No.	15			
ii	For 12m Pole	No.	660			
iii	For Flood Lights	No.	20			

**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)**

BILL OF QUANTITIES

BILL NO. 8 : ELECTRICAL WORKS

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
	Lighting Control Panel					
805	<p>Road lighting control panel with angle iron frame clad 14 SWG, sheet steel enclosure having high quality powder coated paint, color RAL 7032. The LCP shall be complete with incoming and outgoing MCCBs, Cu bus bars, magnetic contactors, photo-electric switches, meters, indication lights, construction with IP 54 protection class, door, locking arrangement etc. and all other accessories as required for quality work.</p> <p>MATERIAL</p> <p>1 No. incoming 63 Amp.(adj.) TP, MCCB, 25 kA 4 No. outgoing 25 Amp. (adj.) TP MCCBs, 25 kA 2 No. outgoing 25 Amp. (adj.) TP MCCBs, 25 kA (Spare) 4 No. 32 Amp. magnetic contactor 2 No. 32 Amp. magnetic contactor (Spare) 3 No. photo-electric switches with timers and relays a) 1 No. ammeters 0-100 Amp, with selector switch (04 position) and CT of 100/5 Amp b) 3 No. indication lights c) 1 No. voltmeter with fuse and 7 position selector switch. d) 3 Ph, N & Earth copper bus bars Internal wiring & line-up terminals etc. Brass cable glands/accessories e) 06 Nos. Auto-Manual-OFF (3 position switches for operation in auto (with photocell) and normal (manual mode photocell override) f) 06 Nos.ON & 06 Nos. OFF push button switch's with indication lights g) Panel Light with limit Switch</p>	Job	20			



**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)
BILL OF QUANTITIES**

BILL NO. 8 : ELECTRICAL WORKS

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
	Earthing					
806.00	Earth point comprising of 10 ft. 5/8" dia. (16 mm dia) copper coated M.S. rods driven in ground near each lighting control panel. The earthing rods shall be completed with fixing clamps etc.	Each	40			
	Transformer					
807 As per WAPDA Specs.	Pole mounted transformer 25 kVA, 11/0.415 kV and all accessories, Installation and Connection Charges with energy meter as per WAPDA standards and practice.	Job	20			
TOTAL FOR BILL NO. 8 CARRIED TO SUMMARY						

Note:

- The cost of materials are inclusive of General Sales Tax (G.S.T)
 - The cost of security deposit and obtaining of 11 kV electrical connection with installation material from WAPDA
 - The above referred cost is for estimation purposes only and are based on budgetary quotations from the different manufacturers/suppliers. The final cost for the referred items shall be decided/finalized by the Client as per method of procurement i.e. open tendering, limited quotations from prequalified manufacturers/suppliers or any other.
- The list of manufacturers/suppliers of different equipment/materials given as below in order to establish conformance of the product in accordance with the relevant International Standards as applicable. The contractor shall provide and fix the equipment/materials of brand new & superior quality as indicated below or equivalent as per approval of the Engineer/Employer.
- LV and Control Cables: As per approved by Client
 - PVC Conduit & Accessories: Beta, Popular, Galco
 - G.I / MS Conduit & Accessories: Hilal Industries, IIL, Jamal, Pioneer
 - MCCBs, MCB: Marlin Gerlin (MG) (France), Siemens (Germany), ABB (Italy), Legrand (France), Terasaki (Japan)
 - Magnetic Contactors: ABB (Italy), Panasonic Green power(Japan), Telemecanique
 - ACBs, ELCBs: ABB (Italy), Siemens (Germany), MG (France) Terasaki (Japan)
 - Photoelectric EE Switches: National Photoelectric EE Switches
 - Relays and Timers: Finder (Italy), Inter (Turkey) - LV Changeover switch: Socomec (France), ABB (France/Germany)
 - Capacitors: Amber, Nokian - Road Light Poles Jamal Pipe Industries, Bashir Pipe Industries and Lion Steel Industries - Lighting: Signify (Philips), Tungsram (GE), Schreder
 - Voltmeter/Ammeters: Circular (Italy), Revalco (Italy), Inter (Turkey), Entes (Turkey)
 - Current Transformer/Voltage Transformer: Circular (Italy), Revalco (Italy), Fico
 - Transformer: ABB, GE, Legrand, PEL or equivalent - Wiring Accessories: Legrang & Clipsal - ATS/AMF Module and Battery Charger: DeepSea, Datakom
 - Selector Switches/ Push button/switches/switch socket: Kraus & Naimer, ABB, Legrand, Clipsal Revalco (Italy) - Indication Lamps: Legrand (France), Breter (Italy) ABB, Telemecanique
 - Terminal Blocks: Legrand (France), ABB, Phoenix, Cabour: Legrand (France), Breter (Italy) ABB, Telemecanique - Cable Trays / Ladders: Bilal Industries Pvt. Ltd, Shaheen Corporation Pvt Ltd, AKS Engineering Pvt Ltd



**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)
BILL OF QUANTITIES
BILL NO. 9 : TOLL PLAZA**

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
	Remodelling of Existing Toll Plaza at Sangjani Complete in all respects	P.S				200,000,000
	TOTAL FOR BILL NO. 9 CARRIED TO SUMMARY					200,000,000



**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)
PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40 KM)
BILL OF QUANTITIES**

BILL NO. 10 : WEIGH STATIONS

Item No.	Item Description	Unit	Quantity	Rate (Rs. In Figures)	Rate (Rs. In Words)	Amount (Rs)
	Weigh Stations - 4 Nos.	P.S				200,000,000
TOTAL FOR BILL NO. 10 CARRIED TO SUMMARY						200,000,000



SECTION 5 - ELIGIBLE COUNTRIES

Eligibility for the Provision of Goods, Works and Non-Consulting Services in Bank-Financed Procurement

In reference to ITT 4.8 and 5.1, for the information of the Tenderers, at the present time, firms, goods and services from the following countries are excluded from this Tendering process:

1. The countries with which Pakistan has no commercial/trade relation as per applicable laws of Pakistan.
2. A country 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 Government of Pakistan (GoP) prohibits any import of goods or contracting of works or services from that country or any payments to entities in that country.

Eligible countries to participate in this application process are those which have been notified by Ministry of Interior, Government of Pakistan, as Business Friendly Countries (BVL); information can be assessed through the following link: <https://visa.nadra.gov.pk/business-visa-list-bvl/>

Section 6: Prohibited Practices

1. The Bank requires that the Recipient (and all other beneficiaries of the Bank financing), as well as tenderers, suppliers, contractors, concessionaires and consultants under Bank-financed contracts for the Project, observe the highest standard of transparency and integrity during the procurement, execution and implementation of such contracts.

2. Definitions. In pursuance of this policy, the Bank defines the terms set forth below as Prohibited Practices:
 - (a) “**Coercive practice**” means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of a party to influence improperly the actions of a party.
 - (b) “**Collusive practice**” means an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party.
 - (c) “**Corrupt practice**” means the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party.
 - (d) “**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.
 - (e) “**Misuse of resources**” means improper use of the Bank’s resources, carried out either intentionally or through reckless disregard.
 - (f) “**Obstructive practice**” means any of the following practices: (i) deliberately destroying, falsifying, altering or concealing of evidence material to a Bank investigation; (ii) making false statements to investigators in order to materially impede a Bank investigation into allegations of a Prohibited Practice; (iii) failing to comply with requests to provide information, documents or records in connection with a Bank investigation; (iv) threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to a Bank investigation or from pursuing the investigation; or (v) materially impeding the exercise of the Bank’s contractual rights of audit or inspection or access to information.
 - (g) “**Theft**” means the misappropriation of property belonging to another party.

3. Any occurrence, or suspected occurrence, of a Prohibited Practice in the procurement, award or implementation of a Bank-financed contract is dealt with in accordance with the provisions of the Bank’s Policy on Prohibited Practices. Suppliers, contractors, service providers and consultants selected pursuant to the provisions of Section II, and concessionaires selected pursuant to paragraph 14.3 of the Bank’s Procurement Instructions for Recipients, as well as the Recipient, shall fully cooperate with the Bank (or a cofinancier undertaking an investigation pursuant to paragraph 6.1 of the Bank’s Procurement Instructions for Recipients) in any investigation into an alleged Prohibited Practice to be carried out pursuant to the Policy on Prohibited Practices, and permit the Bank or its representative (including such cofinancier) to inspect such of their accounts and records as may be relevant for such investigation and to have such records and accounts audited by the auditors appointed by the Bank.

4. Provisions to this effect are included in the Legal Agreements and the procurement contracts with such entities.
5. If the Project is financed by a sovereign-backed loan, the Bank (or, where relevant, a cofinancier having undertaken an investigation pursuant to paragraph 6.1 of the Bank's Procurement Instructions for Recipients):
 - (a) may take any of the following additional actions in connection with a Prohibited Practice under the Project:
 - (i) reject a proposal for award if it determines that the tenderer recommended for award, or any of its personnel, or its agents, or its subconsultants, subcontractors, service providers, suppliers or their employees, has, directly or indirectly, engaged in a prohibited practice in competing for the contract in question; and
 - (ii) cancel the undisbursed portion of the loan allocated to a contract (and require reimbursement of the disbursed portion of the loan allocated to the contract) if it determines at any time that representatives of the Recipient or of a recipient of any part of the proceeds of the loan engaged in a prohibited practice during the procurement, administration or implementation of the contract in question; and
 - (b) requires that a clause be included in tender documents and in contracts financed by the Bank loan, requiring tenderers, suppliers and contractors (and their subcontractors), agents, personnel, consultants, service providers or suppliers, to permit the Bank (and a cofinancier undertaking an investigation pursuant to paragraph 6.1 of the Bank's Procurement Instructions for Recipients) to inspect all accounts, records and other documents relating to the submission of tenders and contract performance, and to have them audited by auditors appointed by the Bank.

SECTION 7 – ‘Works’ Requirements

Table of Contents

Scope of Works.....	154
Specifications	155
Environmental, Social, Health and Safety Requirements	297
Drawings.....	343
Supplementary Information.....	344

Scope of Works

Location: Rawalpindi-Hassanabdal (Section - 7)

Project is located in district Rawalpindi and district Attock of Punjab Province. Rawalpindi is situated along the Grand Trunk Road that connects Peshawar to Islamabad and Lahore. The road is roughly paralleled by the M1 Motorway between Peshawar and Rawalpindi. Hassanabdal is located 40KM Northwest of the country's capital city Islamabad.

Start point of the Project has been taken at IJP Flyover near Quaid-e-Azam Hospital at N5 and terminated at N5 Intersection with N35 near Hassanabdal. This covers a total length of 40 KM. The existing facility is a six and four lane highway, (2 and 3 lanes in each direction)

Necessity:

The priority sections of N-5 are heavily trafficked and congested which leads to hold ups and encumbrances for the commuters. In priority sections, the situation is further aggravated by deteriorating condition of existing pavement which is in poor condition on both south and north bound roads which needs improvement, apart from few stretches where road is fair.

The project will facilitate movement of various types of traffic, including trade, construction materials, agricultural goods, industrial products, and commercial freight, along the N-5 route from Karachi to Torkham.

- Widening and improvement of existing road will increase the traffic carrying capacity of the road and reduce traffic congestions in major urban areas.
- Widening and improvement of existing cross drainage structures is required for safe passage of water accumulating from adjoining catchment areas.
- Geometric improvement of sharp horizontal and vertical curves is required.
- Provision of pedestrian facilities for safe pedestrian movements particularly in populated urban areas is necessary.
- Implementation of project will surely uplift economy of the area and generate employment opportunities for local people and enhance business activities.
- Construction of service roads on both sides is required to improve mobility of through traffic by reducing direct access points of local traffic on main carriageway.

Project Objectives:

- To ensure that the N-5 provides safe, sustainable and disaster resilient road corridor.
- To provide dedicated lane for heavy traffic to minimize the road deterioration.
- To provide service lane in urban areas to manage the local traffic and reduce their direct accessibility on main carriageway.
- To provide protected U-Turns for smooth flow and to minimize the accidents.
- To enhance road safety through Star Rating improvements up to 3 Star or better.

Existing Condition: (Rawalpindi-Hassanabdal Section)

Existing carriageway is 2+2 lanes dual carriageway with 2 to 3m outer shoulder and 1m inner shoulder along with 7 to 8m wide median. Unprotected U-turns, Pedestrian bridges are located throughout the entire length. Average width of the existing carriageway ranges from 8-9m each side. North side of carriage is two lane rigid pavement in partial sections and one lane rigid plus one lane flexible pavement in partial sections. The south side of carriageway is flexible throughout the length. The existing condition of the carriageway is good in Rigid pavement sections and deteriorated in flexible pavement sections.

NHA Intends to provide additional lanes on each side of N-5 (40 KM approximately) between the start and end of project section, which will eliminate traffic problem, allow smooth traffic flow, reduce accidents, time saving and improved operating cost.

Scope of Work:

- Earth work and Allied Activities
- Sub Base & Base
- Surface Courses and Pavement
- Structures (Rigid Pavement, Bridges, Box Culverts, Pedestrian Bridges, Pipe Culverts)
- Drainage and Erosion Works
- Ancillary Works
- General Items
- Electrical Works
- Toll Plaza
- Weigh Stations

Specifications

- | | |
|---|--|
| (a) General Specifications | (NHA's General Specifications 1998)
Attached as Bidding Document, Volume-II:
Specifications |
| (b) The Addenda/Corrigenda to NHA's
General Specifications | Attached in Above Volume-II |
| (c) Special Provisions (Specifications) | (SP-Items) Attached within Bidding
Document as Special Provisions (SP) under
this Section 7 (as follows) |



**NATIONAL HIGHWAY AUTHORITY
GOVERNMENT OF PAKISTAN**



**RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER
PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND
RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)**

**PHASE I-A (141 KM)
SECTION-7 : RAWALPINDI HASSANABDAL ROAD (40 KM)**

BIDDING DOCUMENTS

**PARTICULAR SPECIFICATIONS/
SPECIAL PROVISIONS**



NATIONAL ENGINEERING SERVICES PAKISTAN (PVT) LIMITED
NESPAK HOUSE, 1-C, Block N, Model Town Extension, P.O. Box 1351, Lahore – Pakistan

NATIONAL HIGHWAY AUTHORITY

RECONSTRUCTION OF NATIONAL HIGHWAY N-5 UNDER PAKISTAN'S RESILIENT RECOVERY, REHABILITATION AND RECONSTRUCTION FRAMEWORK PROJECT, PHASE I (210 KM)

PHASE I-A (141 KM) SECTION-7 : RAWALPINDI - HASSANABDAL ROAD (40KM)

TABLE OF CONTENTS

1. PARTICULAR SPECIFICATIONS

Item 107	Structural Excavation & Backfill
Item 108	Formation of Embankment
Item 109	Subgrade Preparation
Item 201	Granular Subbase
Item 202	Aggregate Base Course
Item 203	Asphaltic Base Course (hot plant mix)
Item 305	Asphalt Wearing Course – hot plant mix
Item 401	Concrete

2. SPECIAL PROVISION

SP-413	Polythene Sheet
SP-414	Rebar Chemical Anchor
SP-415	Sonic Integrity Tests (SIT) on all Piles
SP-416	Galvanized Iron Drain Pipe
SP-417	Bitumen Coating
SP-418	Pressurized Epoxy Grouting
SP-420	Steel Hand Railing
SP-615a&b	Gantry Signs
SP-616	NJ Barrier
SP-617	PVC Pipe
SP-618	Tuff Pavers
SP-701	Provisions of survey teams and instruments
SP-702	Provide equip & furnish engineer's office & accommodation
SP-703	Provide, equip and maintain laboratory for the project
SP-705	Detour Roads and Maintenance of Traffic
SP-706	Traffic Control Devices during Construction
SP-708	Provide, running and maintain transport for employer / Engineer's representative
SP-709	Employing Trainee Engineer's with Boarding, Lodging & Messing
SP-710	Deployment of Quantity Surveyor in NHA (HQ) Design Section

3. ELECTRICAL WORKS



PARTICULAR SPECIFICATIONS

ITEM 107 STRUCTURAL EXCAVATION AND BACKFILL

107.1 DESCRIPTION

In line 12, add at the end:

This includes excavation below original ground and back filling with granular or select fill. All common backfilling above the level of the original ground shall be payable under Item 108.

Delete 107.2.1, 107.2.2 and replace with the following.

107.2.1 Backfill around Structure

Backfill around or below structure shall be made with the following material.

- a) Granular backfill / Select Fill material as specified hereunder
- b) Common backfill shall be carried out from excavated material or any other borrow material approved by the Engineer.

107.2.2 Granular backfill/Select Fill

Granular backfill/Select fill material shall meet the following requirements:

a) **Grading Requirement**

mm.	inch	% passing
25	1"	100
19	¾"	60-100
4.75	No. 4	50-80
2.0	No. 10	40-70
0.425	No. 40	25-45
0.075	No. 200	0-15

Material satisfying the requirements of coarse sand falling under soil classification A-3 (AASHTO). In case, coarse sand is utilized for granular fill it shall be ensured that the same is confined properly with approved material.

- b) The material shall have a Plasticity Index of not more than six (6) as determined by AASHTO T-89 and T-90



107.2.3 Common Backfill

In line 3, add after “Engineer” “as per the material requirements in Section 108.2”.

Add Subsection 107.2.5

107.2.5 Requirement of Select Fill Material Below Structures’ Foundations

Requirement of Select Fill material below structures’ foundations shall be as per 107.2 or as directed in writing by the Engineer.

107.3 CONSTRUCTION REQUIREMENTS

107.3.1 Structural Excavation

a) General

Delete para 3, and add the following:

“The Contractor shall notify to the Engineer well in advance about the start of any structural excavation which constitute a pay item in the Bill of Quantities. The Engineer shall observe the cross-sectional elevations and measurements taken for the existing ground in the area of the structure. Any material removed or excavated before these measurements and approved by the Engineer will not be paid.

The Contractor shall minimize, to the extent possible, the length of time that excavated areas are open. He shall be solely responsible for damages due to weather, equipment, accidents, or other causes when excavation is left open. In this regard the Contractor shall take all required precautionary measures such as barriers, barricades and warning signs etc.

d) Preparation of Foundations of Footings

In para (ii), line 2, delete “special, care” and replace with, “special care”.

At the end, add para (iii) and (iv) as follows:

iii) Foundation material on which structure is to be placed shall be compacted as per clause 107.3.3 unless otherwise directed by the Engineer.

In case unsuitable material (as per clause 108.2e) is encountered at foundation level shall be removed to the depth and extent as directed and replaced with suitable material of the type as determined by the Engineer.



iv) (a) **Placement of Select Fill**

All vegetation, topsoil and other unsuitable materials shall be removed. Prior to placement of the first layer of select fill, the ground surface shall be compacted as given in Section 104.2.

(b) **Compaction of Select Fill**

The select fill material shall be placed in layers of thickness appropriate to the type of compaction equipment and compacted to meet the following minimum requirements of compaction at OMC (-2%) to + 1 % of OMC):

- 95 % M.D.D as per AASHTO T 180 or
- 74 % Relative Density as per ASTM-D 4253/4254.

f) **Pumping**

Add the following in the beginning

Care shall be taken during excavation to prevent disturbance to the foundation. If ground water is encountered during excavation and a concrete seal course is not to be used, dewatering shall be commenced and shall proceed in advance of or concurrently with further excavation. The foundation shall be free of water at the time, footing concrete is placed and water control shall continue as necessary to prevent damage to the work.

All dewatering shall be performed at the Contractor's sole expense and shall be considered as included in the contract unit price(s) for the facility being constructed. The sides of excavations shall be sloped as required by soil conditions to stabilize the sides for safe working conditions. The quantities of excavations for said sloping will not be measured for payment. The backfilling shall be done with suitable materials as approved by the Engineer, at Contractor's expense.

h) **Classification of Excavation**

Delete the whole paragraph

107.3.2 Excavation in Embankments

In para 3, line 3, delete "also" and substitute with "Also"

107.3.3 Backfill

Add the following para at the end:

Any temporary backfill or platform constructed by the Contractor for piling purposes or any other work item(s), its preparation, construction and removal



of this work by the Contractor shall not be measured for payment. Its cost shall be deemed included in the respective pay item.

107.4 MEASUREMENT AND PAYMENT

107.4.1 Measurement

a) Structural Excavation

In para 1, line 2, between “position” and “computed” insert “below top soil”

Add at the end of para (1) the following:

However the stability of the structural excavation shall be the responsibility of the Contractor for which he may use any appropriate means including shoring and / or excavation along a suitable slope line without any extra payment.

In para 3, sub-para (1), add at the end:

“Neat lines of footings or foundations shall mean the outer faces of footings or foundations excluding lean concrete.

After para 4, at the end, add the following para:

“No separate payment shall be made for compaction of excavated foundation under structures”.



ITEM 108 FORMATION OF EMBANKMENT

108.1 DESCRIPTION

Add at the end of para.

The work shall also include the compaction, trimming and shaping of the side slopes as shown on the plans and removal of any excess fill as directed by the Engineer prior to placement of top soil on slopes of the embankment where required.

108.2 MATERIAL REQUIREMENTS

Add the following at the end of 1st para.

Wet excavated material which will be suitable when dry and if approved by the Engineer shall first be allowed to dry before being placed in the embankment. If the Contractor wishes to replace the wet (suitable) material with dry material that can be easily compacted to the required density to save his time, the same shall be done at no extra cost to the employer.

b) Delete and replace with following table;

CBR of the material with regard to depth of embankment shall be as follows

Depth of Embankment	CBR at 95% MDD
0 – 30 cm	25%
Below 30 cm	7%

Add after (d)

- e) In case non-cohesive material is used for embankment formation, it shall be properly confined at no extra cost, with a cohesive material having Liquid Limit not more than 25 and Plasticity Index not more than 6 or as approved by the Engineer.
- f) For the purpose of embankment and subgrade construction the following shall be considered as unsuitable materials:
- 1) AASHTO soil classification group of A6 and A7;
 - 2) Material from swamps, marshes and bogs;
 - 3) Peat, logs, stumps, garbage and perishable materials;
 - 4) Material susceptible to spontaneous combustion;
 - 5) Organic Soils, as determined by ASTM D 2487-83 or USBR Earth Manual.



- f) The moisture content of the soil at the time of compaction shall be optimum to achieve the compaction up to the specified density. The maximum dry density and optimum moisture content shall be determined from moisture density test (AASHTO T-180 Method D) performed on different type of soil to be used in the construction of the work. Optimum moisture content and the moisture range required for the soil to achieve the desired compaction shall be approved by the Engineer. The soil shall be compacted at optimum moisture content with +1 % to -2 % tolerances, commensurate with the soil type, unless otherwise directed by the Engineer.

When compaction is determined by "Relative Density Test" then tolerance for moisture content shall be finalized during the compaction trial and approved by the Engineer.

108.3 CONSTRUCTION REQUIREMENTS

108.3.1 Formation of Embankment with Borrow Common Material

After 1st para add following:

If suitable material is not available in the Project area, the Contractor shall blend granular material with locally available soils which are otherwise unsuitable (as per category 1 of 108.2e), to achieve a uniform blend that meets the material requirements stated above without any additional cost to the Employer. Such widely divergent materials may be mixed, sampled and tested outside the embankment limits and the mixture may be used as a proposed source of borrow material as outlined in Section 108.2. However, the Contractor will submit his method statement to the Engineer and get it approved before proceeding with the work. Approval of this method statement by the Engineer shall not relieve the Contractor of his responsibility to use the suitable material in the Works. Material for embankment, obtained and approved as provided above, shall be placed in horizontal layers of uniform thickness and in conformity with the lines, grades, sections and dimensions shown on the Drawings or as required by the Engineer. The layers of loose material other than rock shall be not more than 20 cm. thick, unless otherwise allowed by the Engineer after a trial section is prepared and approved for each material source and/or borrow area.

Delete para 7

Delete last para and replace it with the following:

Side slopes shall be neatly trimmed to the lines and slopes shown on the drawings or as directed by the Engineer, and the finished work shall be left in a neat and acceptable condition. The slopes of the design road cross-section shall be trimmed and compacted to the densities as specified above for different zones". No surplus material shall be permitted to be left at the toe of embankment or at the top of cut section.

Relative Density Test

For cohesion-less free-draining soils for which impact compaction will not produce a well-defined moisture density relationship curve and the maximum density, Test



for Relative density of Cohesion-less soils ASTM D-4253/4254 shall be used to determine the relative density.

Relative density is defined as the state of compactness of a soil with respect to the loosest and densest state at which it can be placed by the laboratory procedures described in the ASTM D-4253/4254. The field Density and actual Moisture Content of the compacted embankment shall be determined by field tests according to AASHTO T 191.

108.3.5 Formation of Embankment in Water Logged Areas

Delete 1st and 2nd paras and replace with the following:

In places where excessive moisture is encountered in natural ground and movement of heavy machinery is not possible as it creates soft spots and movement in ground, all such areas shall be left undisturbed for such period that the top surface dries up and forms a crust. The Contractor shall prepare a moisture profile up to a depth of 1.5 meters.

A blanket layer of 60 cm or more (up to one (01) meter) shall be placed in two lifts in the following manner:

- Material stocked at one end of the subject area.
- The material is then pushed by dozer making a lift of 30 cm.(or half the thickness of total lift)
- The dozer should only move on the spread material making sure that no machinery shall move on natural ground.
- After completing one stretch, the area is proof rolled. Material for 2nd lift is again stocked at one end and pushed by dozer in the similar manner as 1st lift.
- After completing the 2nd lift, the top 15 cm is compacted to 90% of maximum dry density.
- Vibration of roller shall not be allowed on blanket layer in any case.
- After approval of this layer, further filling shall be carried out as per standard procedure of 15 cm compacted layer.

The material of blanket layer/working platform shall be as per clause 108.2 (d) and paid under item 108 c.

It should also be checked that selected grading is such that intrusion into the blanket/working platform material of sub-grade or natural ground surface material is not allowed.

For this condition to be met it will be required that the ratio as below shall be checked and followed:

$$\frac{\text{D15 - (Granular Fill Material)}}{\text{D85 - (Natural Ground Material)}} < 5$$

D15 and D85 mean the particle diameters corresponding to 15% and 85% respectively, passing (by weight) in a grain size analysis.



At the end of clause 108.3.5 add the following:

When the roadway profile is so low that after construction of the lower part of the embankment using a "bridging lift" will not permit the placement and compaction of fifty (50) centimeters of acceptable embankment material, Contractor shall prepare a proposal to raise profile of the embankment and submit it to the Engineer for his approval.

Boulders and rock fragments larger than twenty (20) centimeters in maximum dimension shall not be placed in the embankment any closer than fifty (50) centimeters from top of the subgrade.

Embankment settlement period for critical section, where height is greater than 5.0 meter, is approximately three (3) months. Embankment therefore, shall remain in place for the required settlement period before placing the 30 cm thick subgrade layer.

108.3.6 General Requirements

At the end add the following:

Embankment filling shall be brought up and compacted over the full width of the embankment of the carriageways in one operation in layers parallel with the sub-grade level. At no time shall any part of the embankment width under one carriageway be left more than one layer lower than any other part of the embankment width.

Shoulder construction shall be brought up simultaneously with the pavement construction. In order to prevent water penetration into the pavement layers during construction, shoulder and median construction shall be brought up simultaneously with the pavement construction.

Embankment side slopes shall be neatly trimmed to the lines and slopes shown on the drawings or as directed by the Engineer and the finished work shall be left in a neat and acceptable condition.

108.3.7 Formation of Embankment with A-3 Material

The construction of embankments with A-3 material shall be accomplished as shown on the plans, specified in Particular Specifications and Special Provisions or as directed by the Engineer. Construction of embankment with A-3 material shall be carried out in a series of operations as follows:

Edge berms shall first be constructed along both sides of the staked embankment, except where the embankment is to be constructed against hillsides or existing embankment, using Class A-1, A-2 or A-2-4 soils from roadway excavation or borrow or any other source which can resist erosion by wind and water and are approved by the Engineer. However, if Engineer so approved A-4 material having PI value 4-8 from borrow excavation can be used for confinement. Edge berms shall be constructed with an external side slope as shown on the plans or specified in these Particular Specifications and Special Provisions, but not steeper than one (1) vertical to three (3) horizontal. Edge berms shall be constructed not more than thirty (30) centimeters in height w.r.t A-3 embankment and not less than 2.0 meters wide at the top. The materials shall be placed and spread in layers as specified in these Specifications and compacted as specified in Table 108.3.1.

108.3.8 Formation of Embankment on Existing Structures

When an embankment surface is to be constructed over an area previously occupied by a building basement, cellar, irrigation canal, well, any previous excavation, or other such construction that will not permit the use of normal compaction equipment, the embankment



construction shall conform to the backfilling requirements specified in Structural Backfilling in these Specifications, until the normal compaction equipment can be used. The material shall be compacted to the density specified for the adjacent embankments.

108.3.9 Trial Section

Before starting the filling of the embankment, the Contractor shall construct trial sections of minimum 200 meters and maximum of 500 meters or as directed by the Engineer with each soil type / source proposed to be used as fill material. The soils used in the trials shall be the same as those intended to be used for the formation of embankment and the compacting equipment shall be the same that the Contractor will use for the main work.

The construction of embankment with any type of soil / material source shall be subject to written approval of the Engineer after the trial section made for that particular type of soil/material source.

The objective of these trials shall be to determine the optimum moisture content and the relationship between the number of passes of compacting equipment and density obtained for the soil types under trial and for the verification of the soil type itself. No separate payment will be made for this work, which shall be required as a subsidiary obligation of the Contractor under Pay Item Nos. 108a, 108b or 108c, as the case may be. The Engineer may order additional compaction test sections when deems necessary.

108.4.1 Measurement

iii) Formation from Roadway Excavation

In para 1, last line, delete “&108b”

108.4.2 Payment

Replace the table as under:

Pay Item No.	Description	Units of Measurement
108a	Formation of Embankment from Roadway Excavation in Common Material	CM
108d	Formation of Embankment from Structural Excavation	CM



ITEM 109 SUBGRADE PREPARATIONS

109.2.3 Subgrade Preparation in Earth Cut

Delete para one and two and replace with the following:

In case bottom of subgrade level is within thirty (30) cm of the natural ground, the top \leq fifteen (15) cm material shall be removed and stockpiled at a nearby location. The exposed surface shall then be scarified, broken up, adjusted to optimum moisture content and compacted to minimum density of ninety five (95) percent of the maximum dry density as determined by AASHTO T-180 Method D. Second layer of sub-grade shall then be prepared by incorporating the above mentioned stockpiled material to ensure that the depth of sub-grade layer is thirty (30) cm.

In case, the bottom of sub-grade is below the natural ground by more than thirty (30) cm, the material above the top of sub-grade shall be removed and subsequent layer of thirty (30) cm shall be prepared in two layers as per the method describe above.

At the end add the following:

Subgrade of thirty (30) cm. shall in any case be prepared and compacted in two layers of fifteen (15) cm. each.

109.2.8 Protection of Completed Work

Add at the end:

It will be at discretion of the Engineer to check some or all such reaches for compaction and moisture content before placing the next layer.

109.2.9 Templates and Straightedges

Delete and replace by following:

The Contractor shall provide for the use of the Engineer, satisfactory templates and straightedges in sufficient numbers to check the accuracy of the work, as provided in these specifications and no subsequent work shall be permitted until the sub-grade levels have been checked and approved by the Engineer.

109.2.10 Finishing Tolerances and Requirements

Quality Assurance measuring or testing shall involve verification that the sub-grade is constructed, timely finished and trimmed in a neat, workmanlike manner to the lines, grades and typical cross sections shown on the Plans or staked by the Engineer within the required tolerances.



ITEM 201 GRANULAR SUBBASE

201.2 MATERIAL REQUIREMENTS

Delete para 1 and replace it with the following:

“Material for Subbase shall consists of hard durable crushed gravel, crushed rock and crushed stone fragments and shall be cleaned and free from dirt organic matter and other deleterious substances and shall be of such nature that it can be compacted readily under water and rolling to form a firm stable subbase.”

In para (a):

Delete first sub-para including the table and replace with the following:

- a) The Sub-base material shall conform to gradation requirement as specified in ASTM D-2940 and given below:

Grading Requirements for Crushed Aggregate Sub-base Material		
Sieve Designation		Mass Percent Passing
mm	Inch	
50.0	2	100
37.5	1½	90-100
25.0	1	78-92
9.5	3/8	50-73
4.75	No. 4	30-60
2.00	No. 10	24-50
0.425	No. 40	13-32
0.075	No. 200	0-12

The final gradation decided within the limit designated in the table shall be all graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on the adjacent sieves or vice versa.

Gradation requirements shall not apply on Broken Pavement Material (Asphalt layer/TST is not included) from existing road except passing at 0.075 mm sieve, being reused as Sub-base.

In para (e), line 4, delete “6” and insert “4”



201.3 CONSTRUCTION REQUIREMENTS

201.3.5 Moisture Content Determination

Delete para (b).

Same size of sample should be placed in oven for moisture determination in case of laboratory density (Proctor) and field density to ensure compatible compaction results.

Add at the end:

201.3.7 Protection of Completed Work

Any part of the sub-base that has been completed shall be protected and kept well drained. Any damage resulting from carelessness of the Contractor shall be repaired as directed by the Engineer without additional payment.

The Contractor shall be responsible for all the consequences of traffic being allowed to ply on the sub-base. He shall repair any ruts or ridges occasioned by his own traffic or that of others by reshaping and compacting with rollers of the size and type necessary for such repair. He shall limit the area of sub-base preparation to an area easily maintained with the equipment available. Sub-base preparation and placing of aggregate base course shall be arranged to follow each other closely. The sub-base, when prepared too soon in relation to the placing of the aggregate base course, is liable to deteriorate, and in such case the Contractor shall, without additional payment, repair, reroll, or re-compact the sub-base as may be necessary to restore it to the state specified herein.

It will be at discretion of the Engineer to check some or all such reaches for compaction, moisture content and surface irregularities before placing the next layer.

201.4 MEASUREMENT AND PAYMENT

201.4.2 Payment

Replace the table of Pay Items by the following:

Pay Item No.	Description	Unit of Measurement
201a	Granular Sub-base (Crushed Aggregate)	CM
201b	Re-use of Broken / Salvaged Granular Material from existing road as Sub-base	CM



ITEM 202 AGGREGATE BASE COURSE

2.2.2 MATERIAL REQUIREMENTS

Delete this Section completely and replace as follows:

Material for crushed aggregate base course shall consist of crushed hard durable gravel, rock or stone fragments. It shall be clean and free from organic matters, lumps of clay and other deleterious substances. The material shall be of such a nature that it can be compacted readily under watering and rolling to form a firm and stable base for both flexible and rigid pavements.

The aggregate base shall comply with the following grading and quality requirements.

- a) The gradation curve of the material shall be smooth, well graded and within the specified allowable tolerances and the envelope.

The grading table as per ASTM D 2940 given below:

Grading Requirements for Crushed Aggregate Base Material		
Sieve Designation		Mass Percent Passing Grading
mm	Inch	
50.0	(2)	100
37.5	(1.5)	95-100
19.0	(3/4)	70-92
9.5	(3/8)	50-70
4.75	No. 4	35-55
0.600	No. 30	12-25
0.075	No. 200	0-8

The final gradation decided within the limit designated in the table shall be all graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on the adjacent sieves or vice versa.

This material shall be obtained by mechanically crushing the material retained on 3" size sieve.

The material shall be well graded so that the coefficient of Uniformity D60/D10 shall be greater than four (4).

- b) The material passing the 19 mm sieve shall have a CBR value of minimum eighty (80) percent, tested according to the AASHTO T-193 / ASTM D-1883. The CBR value shall be obtained at the maximum dry density determined according to AASHTO T 180, Method D.



- c) The Coarse aggregate shall have a percentage of wear by the Loss Angeles Abrasion test (AASHTO T-96) of not more than forty percent (40%).
- d) The fraction passing the No. 200 sieve shall not be greater than two third of the fraction passing the 0.425 mm (No 40) sieve.
- e) The portion of filler, including any blended material, passing No. 40 mesh sieve shall have a liquid limit not more than 25 and a plasticity index not more than 6 as per AASHTO T 89 & T 90
- f) The sand equivalent determined according to AASHTO T-176 shall not be less than 45.
- g) Crushed Aggregate (material retained on sieve No. 4) shall consist of material of which hundred (100) percent by weight shall be crushed particles having a minimum one fractured face and at least ninety (90) percent by weight shall be crushed particles, having a minimum of two (2) fractured faces.
- h) The material shall have a loss of less than twelve (12) percent when subjected to five cycles of the Sodium Sulphate Soundness test according to AASHTO T-104.
- i) Flat, elongated, soft and disintegrated pieces shall not exceed 10 % of total volume of Crushed Aggregate Base Course.
- j) Friable particles tested according to AASHTO T-112 shall not exceed 0.25 %.

202.2.1 Filler for Blending

In the table change Plasticity Index value from “6 maximum” to “4 maximum” and Sand Equivalent value from “30 minimum” to “45 minimum”

202.3 CONSTRUCTION REQUIREMENTS

Delete this Section completely and replace as follows:

202.3.1 Mixing of Aggregate Material

Mixing of different sizes of aggregate and stone dust shall be **mixed in the central mixing plant/pug-mill at proper moisture content**. Mixing at site or over prepared sub-base shall not be allowed in any case.

It shall be mandatory for the Contractor to lay aggregate base course in specified



thickness, line and grade on approved surface using mechanical paver. Dumping the aggregate base material on prepared sub-base and spreading with motor grader will not be allowed. The paver shall be power propelled unit, provided with automatically controlled screeds and feed controls capable of spreading the aggregates and maintaining specified thickness and grade. The paver shall be equipped with receiving hoppers having sufficient capacity for a uniform paving operation. The paver shall be operated at a constant speed to give best results. The mechanical paver has to be approved by the Engineer's Representative prior to start of paving activity.

202.3.2 Preparation of Surface for Crushed Aggregate Base Course

In case crushed aggregate base is to be laid over approved sub-base course, the sub-base course shall not have loose material or dried / over moist condition w.r.t optimum moisture content.

202.3.3 Compaction Process

Compaction process shall conform in all respect to the requirements specified under this heading in Item 201 (201.3.3).

202.3.4 Compaction Requirement

The relative compaction of each layer of the compacted base shall not be less than 100 percent of the maximum dry density determined according to AASHTO T-180, Method D after adjustment of coarse particles obtained during field density test (retained on 19 mm sieve or 4.75 mm sieve whichever is applicable) as per AASHTO Method T-224. The field density shall be determined according to AASHTO T-191.

Completed base course shall be maintained in an acceptable condition at all times until prime coat is applied. When base course is to carry traffic for an indefinite length of time before receiving surfacing, the Contractor shall maintain the surface until final acceptance and shall prevent reveling by wetting, blading, rolling and addition of fines as may be required to keep the base tightly bound and leave a slight excess of material over the entire surface which must be removed and the surface finish restored before application of prime coat.

202.3.5 Moisture Content Determination

Moisture content determination shall conform in all respects to the requirements specified under clause 201.3.5 for sub-base.

202.3.6 Trial Sections

Prior to commencement of crushed aggregate base course operations, a trial section of two hundred (200) meters minimum, but not to exceed five hundred (500) meters shall be prepared by the Contractor using same material and equipment as will be used at site to determine the adequacy of equipment, loose depth measurement necessary to result in the specified compacted layer depths.



field moisture content, and relationship between the number of compaction passes and the resulting density of material.

202.3.7 Surface Tolerance

Grade control shall be accomplished by means of grade stakes, steel pins or forms, placed in lanes parallel to the centerline of the road and at intervals sufficiently close to permit placing of string lines or straightedges for checking purposes.

The surface layer of the crushed aggregate base course shall be evaluated for compliance with the following surface tolerances:

- a) The cross section of the finished aggregate base surface shall be checked by the Contractor in the presence of the Engineer at maximum intervals of twenty-five (25) meters and at intermediate points as directed by the Engineer.
- b) The allowable tolerances in design elevation of the finished base are stated in "Table for Allowable Tolerances" in these Specifications.

Isolated deviations below the design elevation shall be compensated by additional thickness of the subsequent pavement layer. Additional cost and materials resulting from deviations from the design elevation shall be borne by the Contractor.

202.3.8 Acceptance, Sampling and Testing

Acceptance of sampling and testing with respect to materials and construction requirements shall be governed by the relevant, "Table for Sampling and Testing Frequency" or as approved by the Engineer.

202.3.9 Protection of Completed Work

Any part of the aggregate base course that has been completed shall be protected and kept well drained. Any damage resulting from carelessness of the Contractor shall be repaired as directed by the Engineer without additional payment.

The Contractor shall be responsible for all the consequences of traffic being allowed to ply on the aggregate base course. He shall repair any ruts or ridges occasioned by his own traffic or that of others by reshaping and compacting with rollers of the size and type necessary for such repair. He shall limit the area of aggregate base course preparation to an area easily maintained with the equipment available. Aggregate base course preparation and placing of asphalt base course shall be arranged to follow each other closely. The aggregate base course, when prepared too soon in relation to the placing of the asphalt base course, is liable to deteriorate, and in such case the Contractor shall, without additional payment, repair, re-roll, or re-compact the aggregate base course as may be necessary to restore it to the state specified herein.



It will be at discretion of the Engineer to check some or all such reaches for compaction, moisture content and surface irregularities before placing the next layer.

202.4.2 Payment

Replace the pay Item table as follows:

Pay Item No.	Description	Unit of Measurement
202i	Aggregate Base Course with Paver (Graded through Pugmill)	CM



ITEM 203 ASPHALTIC BASE COURSE (HOT PLANT MIX)

Delete the entire item and replace it by the following:

203.1 DESCRIPTION

This work shall consist of furnishing plant, labor, equipment, materials, mixing aggregates and asphalt binder and additive material (where required) at a central batch asphalt mixing plant, to a specified temperature, hauling, including loading unloading, laying and compacting the mixture on an approved primed sub-grade, sub-base or base course in accordance with these Specifications and in conformity with the lines grades and typical cross-sections shown in the Drawings or as directed by the Engineer.

203.2 MATERIAL REQUIREMENTS

203.2.1 Mineral Aggregate

Mineral aggregate for bituminous base course shall consist of coarse aggregate, fine aggregate and filler material, if required, all conforming to the following requirements:

Coarse aggregate which is the material retained on AASHTO No. 4 sieve shall consist of crushed rock, crushed gravel or crushed boulder. It shall be clean, hard, tough, sound, durable, and free from decomposed stones, organic matter, shale, clay lump or other deleterious substances. Rock or boulders, from which coarse aggregate is obtained, shall be of uniform quality throughout the quarry.

The crushing shall be so regulated that (material retained on sieve # 4) shall have all faces crushed without any uncrushed surface. The type of source shall be uniform throughout the quarry location from where such a material is obtained. Rock to be crushed for use as bituminous concrete aggregate, shall be screened in such a manner that all material to be crushed is retained on a 75 mm (3") screen.

Fine aggregate which is material passing No. 4 sieve, shall consist of 100% crushed material from rock and shall be stored separately. No natural sand will be allowed in the mix.

When the combined grading of the coarse and fine aggregates is deficient in material passing No. 200 sieve, additional filler material shall be added. The filler material shall consist of finely divided rock dust, including dust from plant collection system, hydrated lime, hydrated cement or other suitable mineral matters free of deleterious material conforming to the requirements of AASHTO M-17. However, in case the coarse aggregates are of quartzitic nature, then hydrated lime or a better material shall be required. At the time of use, it shall be sufficiently dry to flow freely. Filler material shall conform to following gradation:



US Standard Sieve	Percent Passing by Weight
No. 30	100
No. 50	95 – 100
No. 200	70 – 100

The ratio of filler to binder should range from 1.0-1.5.

The coarse and fine aggregates shall meet the following requirements:

- a) The coarse aggregate shall have a percentage of wear by the Los Angeles Abrasion test (AASHTO T-96) not more than forty (40).
- b) The coarse and fine aggregates shall have a Specific Gravity value of not less than 2.60 and value for absorption of water not more than 2% as determined by AASHTO T 84 and T 85.
- c) The material shall have a loss of less than twelve (12) percent when subjected to five cycles of the Sodium Sulphate Soundness test according to (AASHTO T-104).
- d) The Sand Equivalent (AASHTO T 176) determined after all processing except for addition of asphalt cement shall not be less than forty five (45).
- e) The fine fraction of the material shall have a liquid limit not more than twenty five (25) and a Plasticity Index (as determined by AASHTO T-89 and T-90) not more than four (4). The plasticity index of mineral filler should not be more than four (4).
- f) The portion of aggregate retained on the 9.5 mm (3/8 inch) sieve shall not contain more than fifteen (15) percent by weight of flat and/or elongated particles as determined in accordance with ASTM D 4791, standard test method for flat and/or elongated pieces (ratio of maximum to minimum dimension = 3:1).
- g) The coarse aggregate when tested by the Coating and Stripping Test (AASHTO T-182) shall have a coated area above ninety five (95) percent.
- h) Petrographic examination of the coarse aggregate is mandatory for the approval of source. The coarse aggregates shall be checked for cationic and anionic behavior so that their affinity with the bitumen to be used is verified.



203.2.2 Asphalt Material

Asphalt binder for asphalt base course shall be asphalt cement 60-70 penetration grade, conforming to the requirement in Table 301-2 of Item Asphaltic Materials in these Specifications.

When asphalt cement 60-70 penetration grade is used, the optimum ratio between bituminous material and filler shall be so determined that the bituminous filler mixture will reach its softening point, not less than eighty (80) degree centigrade when tested in accordance with AASHTO T 53

203.2.3 Asphalt Base/Leveling Course Mixture

The composition of the asphalt base/leveling course mixtures for base course shall conform to classes shown in the following table:

Table 203-1

Combined Aggregate Grading Requirements

Mix Designation	Class-A	Class-B
Use	Leveling/Base	Leveling/Base
Compacted Thickness	75-100 mm	75-100 mm
<i>U.S. Standard Sieve Size</i>	<i>Percent passing by weight</i>	
1½" (38 mm)	100	100
1" (25 mm)	75-90	90-100
¾" (19 mm)	65-80	-
½" (12.5 mm)	55-70	56-80
⅜" (9.5 mm)	45-60	-
No. 4 (4.75 mm)	30-45	29-59
No. 8 (2.38 mm)	15-35	19-45
No. 50 (0.300 mm)	5-15	5-17
No. 200 (0.075 mm)	2-7	1-7
Asphalt Content by weight of mix (%)	3 (Minimum)	

Class-B shall be used for Asphaltic Base / Levelling course unless specified otherwise by the Engineer. The grading limits specified are based on materials of uniform specific gravity and shall be adjusted by the Engineer to compensate any variation in specific gravity of individual sizes. The grading may be varied by the Engineer on the basis of Marshall Tests to obtained optimum stability and life of completed asphalt pavement. Grading limits determined by Fuller Equation (MS – 2) should be avoided.

The asphalt leveling/base course mixture shall meet the following Marshall Test Criteria:



Compaction, number of blows to each end of specimen	75
Stability (30 minutes/60 °C)	1,000 kg (Min.)
Flow, 0.25 mm (0.01 in.)	8-14 (2 – 3.5)
Percent air voids in mix	4-6
Percent voids in mineral aggregates	According to table 5.3 MS-2, Asphalt Institute sixth edition or the latest edition
Percent voids filled with asphalt	50-65
Loss of Marshall Stability	25 percent (max.)

203.2.4 **Job-Mix Formula**

At least eight (8) weeks prior to commencement of asphalt, the Contractor shall start the tests for the design of JMF for the asphalt base course production for the Project. At least one week prior to production, a JMF for the asphalt mix to be used shall be established jointly by the Contractor and the Engineer meeting Project Specification requirements.

The JMF shall be established by Modified Marshall Method of Mix Design for Large Aggregate according to the procedure prescribed in the Asphalt Institute Manual Series No. 2 (MS-2), Sixth Edition, taking into account following recommendations.

The JMF, with the allowable tolerances shall be within the range specified in Item 203.2.3 and herein. Each JMF shall indicate a single percentage of aggregate passing each required sieve size and a single percentage of bitumen to be added to the aggregate.

Marshall mixing temperature shall be one hundred and sixty plus/minus five (160 ± 5) degree centigrade at which heated asphalt produces a kinematic viscosity one hundred and seventy \pm twenty (170 ± 20) centistokes.

Marshall compacting temperature shall be one hundred and forty five plus/minus five (145 ± 5) degree centigrade at which heated asphalt produces a kinematic viscosity of two hundred and eighty plus/minus thirty (280 ± 30) centistokes.

The combined gradation should produce a smooth curve within the master grading band for designated mix. The job-mix formula with allowable tolerances for a single test then becomes the job control grading band. If application of job-mix



tolerances results in a job control grading band outside the master grading band, the full tolerances shall still apply. The asphalt content thus determined shall be used to check for compliance for stability, flow and voids filled, etc. as per the specifications. Minimum coating of bitumen film on aggregate should be 8 micron.

METHODOLOGY FOR MODIFIED MARSHAL METHOD

Mixes composed of larger size aggregates with maximum size up to 38 mm (1.5 inches) will be prepared according to modified Marshall Method as per MS-2 Asphalt institute, sixth edition, 1993 or the latest edition. The procedure is basically the same as the original method except for following differences that are due to the larger specimen size that is used:

- a) The hammer weighs 10.2 kg (22.5 lb.) and has a 149.4 mm (5.88 inches) flat tamping face. Only mechanically-operated device is used for the same 457 mm (18 inches) drop height.
- b) The specimen has a 152.4 mm (6 inches) diameter by, 95.2 mm (3.75 inches) height.
- c) The batch weights are typically of 4 Kg.
- d) The equipment for compacting and testing (molds and breaking heads) are proportionately larger to accommodate the larger specimens.
- e) The mix is placed in the mold in two approximately equal increments, with spading performed after each increment to avoid honey-combing.
- f) The number of blows needed for the larger specimen is 1.5 times (75 or 112 blows) of that required for the smaller specimen (50 or 75 blows) to obtain equivalent compaction.
- g) The design criteria shall be modified as well, the minimum stability shall be 2.25 times and the range of flow values shall be 1.5 times normal-sized specimens.
- h) Similar to the normal procedure, following values shall be used to convert the measured stability values to an equivalent value for a specimen with a 95.2 mm (3.75 inches) thickness, if the actual thickness varies:

Approximate Height mm (inches)	Specimen Volume (Cubic cm)	Correlation Ratio
88.9 (3 1/2)	1608 to 1626	1.12
90.5 (3 9/16)	1637 to 1665	1.09
92.1 (3 5/8)	1666 to 1694	1.06
93.7 (3 11/16)	1695 to 1723	1.03
95.2 (3 3/4)	1724 to 1752	1.00
96.8 (3 13/16)	1753 to 1781	0.97
98.4 (3 7/8)	1782 to 1810	0.95
100.0 (3 15/16)	1811 to 1839	0.92
101.6 (4)	1840 to 1968.	0.90



Prior to final approval, the proposed job mix, with a Asphalt content at the permissible upper percentage limit determined in JMF, shall be compacted to refusal density (when density does not increase with additional compaction efforts or breakage of stones start) such that the resulting air voids in the mix shall not be less than 3%.

Once JMF is established, all mixtures furnished for the project represented by samples taken from the asphalt plant during operation, shall conform thereto. Moreover upon receiving the job-mix, approved by the Engineer, the Contractor shall adjust his plant to proportion the individual aggregates, mineral filler and asphalt to produce a final mix that when compared to job mix formula shall be within the following limits.

Maximum Variation of Percentage of Materials

Retained No. 4 and larger	± 7.0 %
Passing No. 4 to No. 100 sieve	± 4.0 %
Passing No. 200	± 1.0 %
Asphalt Content (weight % of total mixture)	-0.2% to +0.2 %

In addition to meeting the requirements specified in the preceding items, the mixture as established by the JMF shall also satisfy the following physical properties:

- a) Loss of Marshall Stability by immersion of specimen in water at sixty (60) degree centigrade for 24 hours as compared with stability measured after immersion in water at sixty (60) degrees centigrade for twenty (20) minutes shall not exceeds twenty five (25) percent. If the mixture fails to meet this criterion, the JMF shall be modified.
- b) In case mix fails to meet the stripping test requirement then anti-stripping agent shall be used for which no separate payment shall be made.
- c) Should a change of source of materials be made, a new JMF shall be established before the new material is used. When unsatisfactory results or other conditions make it necessary, a new Job Mix Formula will be required.
- d) The assistance of the Engineer in the preparation of the job standard mix in no way relieves the Contractor of the responsibility of producing an Asphalt mix meeting the requirements of the Specifications.
- e) The density of the compacted mixes shall be related to the daily Marshall Density which shall be determined by making three standard Marshall Specimens from samples of the mix taken from behind the paver. The density of each sample shall be determined and compared with the mean value. Any individual result which varies from the mean by more than 0.015 gm/cc shall be rejected. Marshall Test shall be repeated on a daily basis to establish the



- f) Daily Marshall Density for that particular day's work or one sample of 500T production. The daily Marshall Density shall not vary from the Job Mix Design Density by more than $\pm 1.0\%$. Loss of stability shall be tested on other three Marshall Specimens from samples of the mix taken from behind the paver.
- g) The compliance criteria contained in the Job Mix Tolerances provide an indication of the maximum acceptable value of the standard deviation for each parameter. If asphalt mix shows variation in excess of these limits, the source of variation shall be determined by the Contractor and rectified by him to the satisfaction of Project Specifications and Engineer. If the excessive variations continue, the Engineer shall order stoppage of production and laying for the Works, until the Contractor has demonstrated his ability to re-establish acceptable control.

203.2.5 Asphalt Additives

Hydrated lime or any other additive may be used as an anti-stripping agent as and when required. When used, hydrated lime shall be added at a rate between 1% and 2% by weight of the total mix with the aim of eliminating stripping tendencies. Hydrated lime shall be fed by a separated feeding system into pug mill for each batch. Percentage of additive and relative specifications for any other type of additives shall be based on manufacturer's specifications for the product, subject to approval of the Engineer.

No additional cost shall be paid for use of hydrated lime or any other anti-stripping additive, and payment shall be deemed to be included in the respective pay items of asphaltic base course.

203.3 CONSTRUCTION REQUIREMENTS

203.3.1 Asphalt Mixing Plant

Mixing plants used for the preparation of Asphalt Mixtures shall be batch plants conforming to AASHTO M-156, and of adequate capacity, coordinated and operated to produce a mixture within the limits of specifications. Plant shall have minimum three cold bins and at least 3^{1/2} decks of hot sieves to effectively control the gradation of hot bins. It should be provided with facilities necessary for protection of environment such as dust control facility. Special emphasis shall be given to the following considerations:

- A large bucket to handle a batch in a single weighing.
- The mixer box shall be equipped with a dust hood to prevent loss of dust by dispersion.
- A mechanical batch counter shall be installed as part of the timing device and shall be designated to register only completely mixed batches.



- The plant shall be fully computerized batch-plant.
- The automatic proportioning system shall be capable of consistently delivering materials within the full range of batch sizes within the following tolerances:

Description	Total Batch Weight of Paving Mix %
Batch aggregate component	±1.5
Mineral filler	±0.5
Bituminous material	±0.1
Zero return (aggregate)	±0.5
Zero return (bituminous material)	±0.1

An automatic graphic or digital record shall be produced for each batch of bituminous concrete indicating the proportions of each aggregate component, mineral filler, and bituminous material. Such records of the batches shall be further identified through a print of day and date. Bituminous material proportions shall be recorded either as weight or volume.

203.3.2 Preparation of Aggregates

Before being fed to the dryer, aggregates for the asphalt base courses shall be separated into three or more sizes and stored separately in cold bins. One bin shall contain aggregate of such size that eighty (80) percent will pass sieve No. 4, and the other two bins shall contain aggregate of such sizes that eighty (80) percent will be retained on sieve No. 4. Should fine material, be incorporated in the mix, a separate bin shall be provided in addition to the three bins mentioned above. If filler is used as a separate component it will also be stored and measured separately and accurately before being fed into the mixer through filler screw mechanism.

Each aggregate ingredient shall be heated and dried at a temperature not to exceed one hundred and seventy (170) degree centigrade. If aggregates contain sufficient moisture to cause foaming in the mixture or their temperature is in excess of one hundred and seventy (170) degree centigrade they shall be removed from the bins and returned to their respective stock piles. Immediately after heating, the aggregates shall be screened to required sizes and stored in separate bins for batching and mixing with Asphalt material

In placing the materials in bins or in moving those from bins to the mixer, any method which causes segregation or uncontrolled combination of material of different grading shall be discontinued.

Asphalt cement shall be heated within a temperature range of hundred and thirty



five to hundred and sixty three (135-163) degrees centigrade at the time of mixing. Asphalt cement heated above maximum shown shall be considered overheated and shall be rejected and removed from job site.

Dried aggregate weighed and drawn to pug-mill shall be combined with proportionate quantity of asphalt cement according to the job mix formula. Temperature of asphalt, except for temporary fluctuations, shall not be lower than fifteen (15) degree centigrade below the temperature of the aggregate, at the time; the two materials enter into the pug-mill. In no case shall the temperature of an asphalt mix exceed one hundred and sixty five (165) degree centigrade when discharged from the pug-mill.

203.3.3 Hauling Equipment

Dump truck used for hauling bituminous mixtures shall have tight, clean, smooth metal beds which have been thinly coated with an approved material to prevent adhering of material to the beds. Each truck shall have a cover of canvas or of other suitable material of sufficient size as to protect the mixture from the weather. The mixture will be delivered on the road at a temperature not less than hundred and forty five plus/minus five (145 ± 5) degree C. Drivers of dump trucks will ensure that while reversing the vehicles, paver is not pushed back producing a hump.

203.3.4 Bituminous Pavers

Bituminous pavers shall be self-contained, power-propelled units, provided with an automatically controlled activated screed or strike-off assembly, heated if necessary, capable of spreading and finishing courses of bituminous plant mix material in lane widths applicable to the specified typical section and thickness shown on the plans. Pavers used for shoulders and similar construction shall be capable of spreading and finishing course of bituminous plant mix material in widths shown on the plans.

The paver shall be equipped with a receiving hopper having sufficient capacity for a uniform spreading operation. The paver shall be equipped with automatic feed controls, properly adjusted to maintain a uniform depth of material ahead of the screed.

The screed or strike-off assembly shall be capable of producing a finished surface of the required evenness and texture without tearing, shoving or gouging the mixture.

When laying the mixtures, the paver shall be capable of being operated at forward speeds consistent with satisfactory laying of the mixture. The paver shall be operated at speeds which will give the best result for the type of power being used.

The mixed material shall be delivered to paver in time to permit completion of spreading, finishing and compaction of mixture during day light hours.



The paver shall be equipped with automatic screed controls with sensors for either or both sides of the paver, capable of sensing grade from an outside reference line, sensing the transverse slope of the screed and providing the automatic signals which operate the screed to maintain the desired grade and transverse slope. The sensor shall be so constructed that it will operate from a reference line or a ski-like arrangement.

The transverse slope controller shall be capable of maintaining the screed at the desired slope within plus or minus 0.1 percent variation.

Manual operation will only be permitted in the construction of irregularly shaped and minor areas.

Whenever a breakdown or malfunction of the automatic controls occurs, the equipment may be operated manually or by other methods in order to allow the contractor to use the asphalt already produced at the plant or in transit, provided this method of operation will produce results otherwise meeting the specifications.

Reference lines will be required for both outer edges of the traveled way for each main line roadway for vertical control. Horizontal control utilizing the reference line will be permitted. The grade and slope for intermediate lanes shall be controlled automatically from reference lines or by means of a ski and a slope control device or a dual ski arrangement. When the finish of the grade prepared for paving is superior to the established tolerance and, when in the opinion of the Engineer, further improvement to the line, grade, cross sections and smoothness can best be achieved without the use of the reference line; a ski-like arrangement may be substituted subject to the approval of the Engineer. The use of the reference lines shall be reinstated immediately whenever the Contractor fails to maintain a superior pavement. The Contractor shall furnish and install all pins, brackets, tensioning devices, wire and accessories necessary for satisfactory operation of the automatic control equipment.

203.3.5 Rollers

Rollers shall be steel wheel, pneumatic tyre and vibratory, or a combination thereof. The roller(s) shall be in good condition, capable of reversing without backlash, and shall be operated at speeds slow enough to avoid displacement of the bituminous mixture. The number and weight of rollers shall be sufficient to compact the mixture to the required density while it is still in a workable condition. Vibratory rollers shall be acceptable for bituminous mixture compaction. The use of equipment, which results in excessive crushing of the aggregate, will not be permitted.

203.3.6 Preparation of Base or Existing Pavement Surface

Before spreading materials, the surface of base or existing pavement on which the mix is to be placed shall be conditioned by application of a prime or tack coat as specified.



After a prime coat is applied, it shall be left undisturbed not less than forty eight (48) hours. The Contractor shall maintain the primed surface until the mix material has been placed. This maintenance shall include the spreading of sand or other approved material, if necessary to prevent adherence of the prime coat to the tyres of vehicles using the primed surface, and patching any breaks in the primed surface with additional bituminous material. Any area of primed surface that has become damaged shall be repaired before the mix is placed, to the satisfaction of Engineer. It shall be ensured that primed surface is not in tacky condition, when premix is laid.

After a tack coat is applied, it shall be allowed to dry until it is in the proper condition of tackiness to receive the mix. The tack coat shall be applied only as far in advance of the placing of mix, as is necessary to obtain the proper condition of tackiness. Any breaks in the tack coat shall be repaired.

When the surface of the existing pavement or old base is irregular, it shall be brought to uniform grade and cross-section by leveling course as directed. The leveling course mixture shall conform to the requirements of Item 203.2.

A thin coating of bituminous material shall be sprayed on contact surface of curbing, gutters, manholes, and other structures, prior to the bituminous mixture being placed against them.

203.3.7 Spreading and Finishing

The mixture shall be laid upon an approved surface, spread and struck off to the section and elevation established. Bituminous pavers shall be used to distribute the mixture either over the entire width or over such partial width as may be practicable.

Longitudinal joints for each course shall be offset thirty (30) centimeters from the joint in the immediate underlying course. Transverse joints shall be offset a minimum of sixty (60) centimeters from the joint of the immediate underlying course.

Longitudinal joints shall be located within fifteen (15) centimeters of the centerline of the roadway or within fifteen (15) centimeters of the centerline of a lane. Longitudinal joints shall be held to the minimum practical number. Longitudinal joints shall be formed by lapping the screed over the first layer placed, crowding a ridge of Asphalt material at the joint and crimping the ridge of material into the joint by a compaction roller while the material is hot.

Transverse joints shall be formed by cutting back the first layer placed to the full depth of the layer, removing and wasting the material, spreading new Asphalt material in sufficient quantity to create a compacted thickness equal to the thickness of the first layer. The joint shall be cross rolled with one coverage and the joint checked with a straight edge not less than four (4) meters in length. High points shall be removed and sags filled with additional Asphalt material and the joint rolled a second time. The joint shall again be checked with a straight edge.



humps and sags adjusted as necessary, and rolled until the joint is complete and compacted as specified.

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable, the mixture shall be spread, raked and luted by hand-tools. For such areas the mixture shall be dumped, spread and screeded to give the required compacted thickness, ensuring even distribution of coarse and fine material.

When production of the mixture can be maintained and wherever practical, pavers shall be used in echelon to place the wearing course in adjacent lanes and compacted to form a surface without lateral joint.

All mixtures shall be spread at a temperature of not less than hundred and forty five plus/minus five (145 ± 5) degree C and all initial rolling or tamping shall be performed when the temperature of the mixture is such that the sum of the air temperature plus the temperature of the mixture is between 165 degree C and 190 degree C. The mixture shall not be placed on any wet surface or when weather conditions will otherwise prevent its proper handling or finishing.

Asphalt concrete pavement asphalt base course shall not be placed on any wet or frozen surface, during rain, dust or sand storms, when wind or other weather conditions prevent the proper handling of the Asphalt mixtures or when atmospheric temperature is five (5) degree centigrade or less. Care should be taken during spreading operation under windy condition in winter, even if temperature is above five (5) degree centigrade.

The spreading operations should be immediately terminated if it begins to rain during the operation.

Hand laying of any Asphalt material will be permitted only in the following circumstances:

- a) For laying regulating courses of irregular shape and varying thickness;
- b) In confined spaces where it is impracticable for a paver to operate;
- c) For footways;
- d) At the approaches to expansion joints at bridges or viaducts;

203.3.8 Compaction

After spreading and strike off and as soon as the mix condition permits the rolling to be performed without excessive shoving or tearing, the mixture shall be thoroughly and uniformly compacted. Rolling shall not be prolonged when cracks appear on the surface.

Initial or breakdown rolling shall be done by means of either a tandem steel roller



or three wheeled steel roller. Rolling shall begin as soon as the mixture will bear the roller without undue displacement.

The number and weight of rollers shall be sufficient to obtain the required compaction while the mixture is still in workable condition. The sequence of rolling and the selection of roller types shall provide the specified pavement density. Initial rolling with a tandem steel roller or a three-wheeled steel roller shall follow the paver as closely as possible.

Unless otherwise directed, rolling shall begin at the lower side and proceed longitudinally, parallel to the road centerline, each trip overlapping one-half of the roller width, gradually progressing to the crown of the road. When paving in echelon or abutting a previously placed lane, the longitudinal joint should be rolled first followed by the regular rolling procedure. On super elevated curves the rolling shall begin at the low side and progress to the high side by overlapping of longitudinal trips parallel to the centerline. Intermediate rolling with a pneumatic tyred roller shall be done behind the initial rolling. Final rolling shall eliminate marks from previous rolling. In no case shall the temperature be less than hundred and twenty (120) degree C. for initial break down rolling while all other compaction operations shall be completed before the temperature drops down to hundred and ten (110) degree C.

Rollers shall move at a slow but uniform speed with the drive roll or wheels nearest the paver. Rolling shall be continued until all roller marks are eliminated and a minimum density of Ninety seven (97) percent of a laboratory compacted specimen made from asphalt material obtained for daily Marshall Density is achieved.

Relevant test methods for density of bituminous concrete in place by Nuclear Methods such as ASTM D 2950 (latest version) and or other method as directed by the Engineer shall be used to establish the proper rolling effort and pattern to achieve the required density and to ensure achieving the specified percent compaction during the placement of the bituminous concrete as quality control testing. A calibration factor for the Nuclear Method must be established as per the equipment's manufacture's requirements, and at any time a change is made in the paving mixture, in construction process or after every fifteen days of asphalt production whichever is earlier. Compare the results obtained to samples compacted to Marshall Density to determine percentage of compaction.

Any displacement resulting while reversing the direction of a roller, or from other causes, shall be corrected at once by the use of rakes and addition of fresh mixture when required. Care shall be exercised in rolling not to displace the line and grade of the edges of the bituminous mixture.

To prevent adhesion of the mixture to the rollers, wheels of rollers shall be kept properly moistened with water or water mixed with very small quantities of detergent or other approved material. Excess liquid will not be permitted.

Along forms, curbs, headers, walls and other places not accessible to the roller,



the mixture shall be thoroughly compacted with hot hand tampers, smoothing irons or with mechanical tampers. On depressed areas, tampers be used or cleated compression strips may be used under the roller to transmit compression to the depressed area.

Any mixture that becomes loose and broken, mixed with dirt, or is in any way defective in finish or density shall be removed and replaced with fresh hot mixture, which shall be compacted to conform to the surrounding area. Any area showing an excess or deficiency of bituminous material shall be removed and replaced.

Three steps of rolling are as follows:

a) Breakdown Rolling

Breakdown Rolling may be accomplished with static or vibratory steel-wheeled rollers. Compaction shall be carried out using rollers of approved dead weight smooth wheeled rollers or by multi-wheeled pneumatic tyred rollers of equivalent mass, or by vibratory rollers or a combination of these. Asphalt base/leveling course material shall always be surface finished with a smooth wheeled roller which may be a dead weight roller or alternatively a vibratory roller in non-vibrating mode. Vibratory rollers shall not be used in vibrating mode on bridge decks.

Vibratory rollers may only be used if they are capable of achieving at least the standard of compaction of 9-tonne dead weight roller to meet the specified percent compaction of Marshall Max. Density, and shall be equipped or provided with devices indicating the frequency at which the mechanism is operating and the speed of travel which can be read from the ground.

It is important to start the rolling operation on the low side of the mat (usually the outside of the lane being paved) and progress towards the high side. When adjoining lanes are placed, the same rolling procedure should be followed but only after compaction of the longitudinal joint.

b) Intermediate Rolling

Intermediate rolling with pneumatic tyre rollers and should follow breakdown rolling as closely as possible, while the asphalt mix is still well above the minimum temperature at which densification can be achieved.

Intermediate rolling should be continuous until all of the mix placed has been thoroughly compacted. Regardless of the type of rollers used, the rolling pattern should be developed in the same manner as for breakdown rolling.

c) Finish Rolling

Finish rolling is done solely for the improvement of the surface. It should be accomplished with steel-tired, static-weight tandems or vibratory tandems without vibration while the material is still warm enough for removal of roller



marks.

The material shall be rolled in a longitudinal direction with the driven rolls nearest the paver. The roller should first compact the material adjacent to any joints and then work from the lower to the upper side of the layer overlapping on successive passes by at least half the width of the rear roll or in the case of a pneumatic tyre roller, at least the nominal width of one tyre.

Rollers shall not stand on freshly laid material while there is a risk that it will be deformed thereby.

203.3.9 Frequency of Testing for Cores

One core shall be taken for each 100 linear meter of each lane of Asphalt Base, or fraction thereof, in special cases. If the core so taken fails to achieve the specified compaction (97%), then two (2) additional cores shall be taken in the longitudinal alignment of the road at an interval of three (3) meters on either side with respect to the failing core. If all the three cores give an average of 97% compaction, and the individual compaction of any core is not less than ninety five (95) percent, then the compaction shall be acceptable. If average of the three cores further fails against compaction, then two (2) additional cores shall be taken at a distance of fifteen (15) meters on either side and compaction shall be checked for all the five cores in the same fashion. If average of five cores is 97%, the area will be accepted. In case average of 5 (five) cores is ninety six percent (96%) or more, then Engineer may withhold the payment partly and observe behavior during maintenance period, for the release of full payment or otherwise. In case of failure of the average of these five cores giving average compaction of less than 96%, the failed area shall be removed and subsequently be replaced by specified mix in an approved manner at the expense of Contractor.

203.3.10 Surface Tolerances

Surface smoothness of asphalt base/leveling course shall be measured with four (4) M straightedge by Engineer at selected locations. The variation of surface from testing edge of straightedge between any two (2) contacts shall be determined by placing it parallel and perpendicular to center line of roadway and value thus determined should not vary more than limits prescribed by "Table for Allowable Tolerances" in these Specifications.

Any irregularities that exceed the specified tolerances or that retain water on the surface shall be corrected by removing the defective area and replacing with new asphalt base course without additional cost to the Employer.

203.3.11 Base Thickness Tolerances

For determination of thickness, one (1) core for each hundred (100) linear meter of each lane shall be taken. Unless otherwise permitted, cores extracted for thickness measurement shall not be used for density determination and density cores shall not be used for thickness measurements unless permitted by the



Engineer.

When layer thickness of asphaltic base course is deficient by more than five (5) mm from that specified in the Drawings, the deficiency shall be removed with satisfactory base course material and/or made up by additional asphalt concrete wearing course thickness without extra cost to the Employer. If such remedial action is authorized, revised thickness determinations shall be made by measurements of new cores taken after placing of "Asphaltic Wearing Course" material or as directed by the Engineer. If base course deficiencies are corrected in this manner, full payment for the "Asphaltic Base Course" will be made to the Contractor, but no additional payment will be made for the increase in thickness of the "Asphaltic Wearing Course".

203.3.12 Acceptance Sampling and Testing

Acceptance of samples and testing of materials and construction requirements, shall be governed by the relevant, "Table for Sampling and Testing Frequency" or as approved by the Engineer.

203.3.13 Trial Section

At least 3 days before material from each source of the asphalt concrete is first laid in the Works, the Contractor shall lay a trial area to demonstrate the compaction plant and rolling procedure selected by him for achieving the specified density.

- a) The trial area shall be not less than 200 m in length and of a width to be approved by the Engineer. If the trial area complies with the Specifications, it may form part of the permanent Works;
- b) For the trial the Contractor shall use the materials, mixing and laying plant proposed for the main works;
- c) Where the required level of compaction is not achieved the trial area shall be removed and the trial repeated.

The Engineer shall approve test results and general performance of test area before actual commencement of the work.

203.4 MEASUREMENT AND PAYMENT

203.4.1 Measurement

The quantities for asphaltic leveling / base course will be measured by volume in cubic meters compacted in place. Measurement shall be based on the dimension as shown on plan or as otherwise directed or authorized by the Engineer. No measurement shall be made for unauthorized areas or for extra thickness.



The quantity of asphaltic material used is included in the asphalt mixture and will not be measured separately.

Quantities of liquid asphalt, wasted or remaining on hand after completion of the work, shall not be measured or paid for.

203.4.2 Payment

The quantity determined as provided above shall be paid by volume in cubic meter compacted in place for at the contract unit price for the particular pay item listed below and shown in the Bill of Quantities, which payment shall constitute full compensation for furnishing all labour, materials, tools, plant, equipment, mixing, transporting, laying, shaping, compacting, corrections, maintenance and all the incidentals necessary for the proper completion of the work prescribed in this item. Asphalt additives or anti-stripping agent if allowed and used to meet with JMF requirement shall not be paid directly, payment shall be to be included in the respective pay items of Asphalt Base Course (Hot Plant Mix).

Pay Item No.	Description	Unit of Measurement
203b	Asphaltic Base / Levelling Course - Plant Mix, Class B	CM



**SP- 210 PREPARATION OF EXPOSED AGGREGATE BASE COURSE
SURFACE LAYER**

210.1 DESCRIPTION

This item shall consist of spreading, levelling / line grade, re-compaction of aggregate base course obtained after breaking of asphalt pavement. The material is to be utilized according to the specifications (Aggregate Base Course) and drawings and/or as directed by the Engineer.

210.2 MATERIALS

The granular material obtained from the existing road must meet the specifications outlined by NHA. The material should be free from deleterious substances, such as organic matter, large or uncrushed stones, and other contaminants., and shall be of such nature that it can be compacted readily under watering and rolling to form a firm stable base course.

The material shall comply to the grading and quality requirement of the NHA CSR item 202i.

210.3 COMPACTION REQUIREMENTS

The relative compaction of each layer (minimum 150mm thick) of the compacted base shall not be less than 100 percent of the maximum dry density determined according to AASHTO T-180, Method D after adjustment of coarse particles obtained during field density test (retained on 19 mm sieve or 4.75 mm sieve whichever is applicable) as per AASHTO Method T-224.The field density shall be determined according to AASHTO T-191.

210.4 CONSTRUCTION

Construction requirements will be the same as NHA CSR Item 202i.

210.5 MEASUREMENT

The quantity to be paid for under this item will be in cubic meter in accordance with the plans and specifications and as directed by the Engineer.



210.6**PAYMENT**

The unit price bid per cubic meter shall include the cost of furnishing and placement including all labor, materials and equipment necessary to complete the work.

Item No.	Description	Unit of Measurement
SP-210	Preparation of Exposed Aggregate Base Course Surface Layer	CM



ITEM 305 ASPHALT WEARING COURSE – HOT PLANT MIX

Delete this Item and replace with the following:

305.1 DESCRIPTION

This work shall consist of furnishing and mixing aggregates, asphalt binder and additive material (where required) at a central asphalt mixing plant, to a specified temperature, hauling, including loading unloading, laying and compacting the mixture on an approved primed or tacked base, bridge deck or concrete pavement in accordance with these Specifications and in conformity with the lines grades and typical cross-sections shown in the Drawings or as directed by the Engineer.

305.2 MATERIAL REQUIREMENTS

305.2.1 Asphalt Material

Asphalt Binder for Wearing Course shall be 60/70 penetration grade conforming to requirement in Table 301-2 section Asphaltic Materials in these Specifications.

When penetration grade asphalt 60/70 is used, the optimum ratio between bituminous material and filler shall be so determined that the bituminous filler mixture will reach its softening point, not less than eighty (80) degree centigrade when tested in accordance with AASHTO T 53.

305.2.2 Mineral Aggregates

Mineral aggregates shall consist of coarse aggregate, fine aggregate and crushed rock filler material.

The coarse and fine aggregates shall be clean, hard, durable and sound particles of uniform quality, free from decomposed material, organic material, clay lumps or other deleterious substances.

The coarse aggregate which is the material retained on sieve No. 4 (4.75mm) shall consist of crushed rock 100 % particles having all faces fractured mechanically. The working face of the quarries from which mineral aggregates are being extracted shall be acceptably uniform and be free from layers, veins or intrusions of weathered rock, soil or other unsuitable minerals.

Rock to be crushed for use as bituminous concrete aggregate, shall be screened in such a manner that all material to be crushed is retained on a 75 mm (3") screen.

Fine aggregate which is material passing an AASHTO No. 4 sieve (Khaka / Stone dust), shall consist of 100% crushed limestone from rock having all faces fractured. Fine aggregate shall be stored separately. Natural sand shall not be used in the mix.



When the combined grading of the coarse and fine aggregates is deficient in material passing the AASHTO No. 200 sieve, supplemental fine aggregate shall be mineral filler consist of finely divided rock dust including dust from the plant dust collection system or cement free of deleterious material conforming to the following grading:

Standard Sieve Size AASHTO	Percentage Passing by Weight
No. 30	100
No. 50	95-100
No. 200	70-100

Mineral filler, at the time of use, shall be dry, free flowing, without lumps or agglomerations and conform to the requirements of AASHTO M-17.

The ratio of filler to binder should range from 1.0-1.5

The coarse and fine aggregates shall meet the following requirements:

- a) The coarse aggregate shall have a percentage loss by the Los Angeles Abrasion test (AASHTO T-96) of not more than thirty (30) percent.
- b) The coarse aggregates and fine aggregate shall have a Specific Gravity Value of not less than 2.65 & 2.60 respectively and value for absorption of water not more than 2% as determined by AASHTO T 84 and T 85.
- c) The material shall have a loss of less than ten (10) percent when subjected to five cycles of the Sodium Sulphate Soundness test according to AASHTO T-104.
- d) The Sand Equivalent (AASHTO T-176) determined after all processing except for addition of asphalt cement shall not be less than forty five (45).
- e) The fine fraction of the material shall have a liquid limit not more than twenty five (25) and a plasticity index (as determined by AASHTO T-89 and T-90) not greater than four (4). The plasticity index of mineral filler (if added separately) should not be more than four (4).
- f) The portion of aggregate retained on the 9.5 mm (3/8 inch) sieve shall not contain more than ten percent (10 %) flat and/or elongated particles (ratio of maximum to minimum dimensions = 3:1) or as determined in accordance with ASTM D 4791, standard test method for flat and/or elongated pieces.
- g) The coarse aggregate when tested by the Coating and Stripping Test (AASHTO T-182) shall have a coated area above 95 percent. In addition to this test, a test for coating and stripping shall be run after submerging the coated material in water at 60° C for 96 hours. The aggregate in this test shall have a coated area of above 80 percent.



- g) Petrographic examination of the coarse aggregate is mandatory for the approval of source. The coarse aggregates shall be checked for cationic and anionic behavior so that their affinity with the bitumen is verified.

305.2.3 Asphalt Concrete Wearing Course Mixture

The grading of combined aggregates prior to addition of bituminous material shall conform to gradation requirements within the following range:

Combined Aggregate Grading Requirements as per ASTM D 3515

Standard AASHTO Sieve Sizes	Percentage Passing by Weight	
	Class A	Class B
1" (25.0 mm)	100	-
3/4" (19.0 mm)	90 – 100	100
1/2" (12.5 mm)	-	90 - 100
3/8" (9.5 mm)	56 – 80	-
No. 4 (4.75 mm)	35 – 65	44 - 74
No. 8 (2.36 mm)	23 – 49	28 - 56
No. 50 (0.3 mm)	5 – 19	5 - 21
No. 200 (0.075 mm)	2 – 8	2 - 10

The minimum binder content shall be 3.5 percent by mass of total weight of mix. The grading limits specified are based on materials of uniform specific gravity and shall be adjusted by the Engineer to compensate any variation in specific gravity of individual sizes. The grading may be varied by the Engineer on the basis of Marshall Tests to obtained optimum stability and life of completed Asphalt Concrete Pavement. Limits determined by Fuller Equation (MS – 2) should be avoided. Class A shall be adopted unless specifically advised otherwise by the Engineer.

The asphalt concrete wearing course mixture shall meet the following Marshall Test Criteria:

Compaction (number of blows each end of specimen)	75
Stability (minimum) 30 minutes/60°C	1200 kg
Flow, 0.25 mm (0.01 inch)	8 – 14 (2 – 3.5)
Percent of air voids in mix	3.5 – 5.5
Minimum voids in mineral aggregate	According to Table 5.3 MS-2, Asphalt Institute, sixth edition 1993
Percent Voids filled with Asphalt	60 – 75
Loss of stability (maximum)	20



305.2.4 Asphalt Concrete Job-Mix Formula (JMF)

At least eight (8) weeks prior to commencement of asphalt production, the Contractor shall start the tests for the design of a proposed JMF as described in Subsection 305.2.3 above. At least one (1) week prior to production, a JMF for the asphalt mix to be used shall be established jointly by the Contractor and the Engineer.

The JMF shall be established by Marshall Method of Mix Design according to the procedure prescribed in the Asphalt Institute Manual Series No. 2 (MS-2), Oct; 1993 Edition or the latest edition with the following recommendations taken into account:

The JMF, with the allowable tolerances shall be within the range specified in Item 305.2.3 and herein. Each JMF shall indicate a single percentage of aggregate passing each required sieve size and a single percentage of bitumen to be added to the aggregate.

- Marshall mixing temperature shall be one hundred and sixty plus/minus five (160 ± 5) degree centigrade at which heated asphalt produces a kinematic viscosity one hundred and seventy plus/minus twenty (170 ± 20) centi stoke.
- Marshall compacting temperature shall be one hundred and forty five plus/minus five (145 ± 5) ° C at which heated asphalt produces a kinematic viscosity of two hundred and eighty plus/minus thirty (280 ± 30) centi stoke.
- The combined gradation should produce a smooth curve within the master grading band for designated mix. The job-mix formula with allowable tolerances for a single test then becomes the job control grading band. If application of job-mix tolerances results in a job control grading band outside the master grading band, the full tolerances shall still apply. The asphalt content thus determined shall be used to check for compliance for stability, flow and voids filled, etc. as per the specifications. Minimum coating of bitumen film on aggregate should be 8 micron.
- The minimum bitumen binder content according to the results of the Marshall Method of Mix Design should be used provided that it will still satisfy the durability, the stability and the void content requirements.
- The optimum asphalt content shall be based on the percent asphalt content having at least 4.0% air voids for wearing course. The asphalt content thus determined shall be used to check for compliance for stability, flow and voids filled, etc. as per the specifications. Minimum coating of bitumen film on aggregate should be 8 micron.
- Prior to final approval, the proposed job mix, with a bituminous content at the permissible upper percentage limit, shall be compacted to refusal, (400 to 600 blows) and the resulting voids in the mix shall not be less than 2%.



Once JMF is established, all mixtures furnished for the project represented by samples taken from the asphalt plant during operation, shall conform thereto. Moreover upon receiving the job-mix, approved by the Engineer, the Contractor shall adjust his plant to proportion the individual aggregates, mineral filler and asphalt to produce a final mix that when compared to job mix formula shall be within the following limits.

Tolerances for Job-Mix Formula:

Sieve Size	Tolerance %
19 mm (3/4") and larger	± 5
9.5 mm (3/8") and 4.75 mm (No. 4)	± 5
2.36 mm (No. 8)	± 4
300 μm (No. 50)	± 3
75 μm (No. 200)	± 1
Asphalt Content (weight % of total mixture)	-0.2 % to +0.2 %

In addition to meeting the requirements specified in the preceding items, the mixture as established by the JMF shall also satisfy the following physical property.

Loss of Marshall Stability by immersion of specimens in water at sixty (60)⁰C for twenty four (24) hours as compared with the stability measured after immersion in water at sixty (60)⁰C for twenty (20) minutes shall not exceed twenty (20) percent. If the mixture fails to meet this criterion, the JMF shall be modified or an approved anti-stripping agent shall be used. No payment shall be made for anti stripping agent.

Test results along with samples shall be presented to the Engineer for verification and final approval of JMF.

Should a change of source of materials be made, a new JMF shall be established before the new material is used. Also, if results or other conditions make it necessary a new JMF will be required.

The density of the compacted mixes shall be related to the daily Marshall Density which shall be determined by making six standard Marshall Specimens from samples of the mix taken from behind the paver. The density of each sample shall be determined and compared with the mean value. Any individual result which varies from the mean by more than 0.015 gm/cc shall be rejected. Marshall Test shall be repeated on daily basis to establish daily Marshall Density for that particular day's work or one sample for 500 T productions. The daily Marshall



Density shall not vary from the Job Mix Design Density by more than $\pm 1.0\%$. Loss of stability shall be tested on other three Marshall Specimens from samples of the mix taken from behind the paver.

The assistance of the Engineer in the preparation of the job standard mix in no way relieves the Contractor of the responsibility of producing a bituminous mix meeting the requirements of the Specifications.

The compliance criteria contained in the Job Mix Tolerances provide an indication of the maximum acceptable value of the standard deviation for each parameter. If asphalt mix shows variation in excess of these limits, the source of variation shall be determined by the contractor and rectified by him to the satisfaction of the Specifications and the Engineer. If the excessive variations continue, the Engineer shall order stoppage of production and laying for the Works, until the Contractor has demonstrated his ability to re-establish acceptable control.

305.3 CONSTRUCTION REQUIREMENTS

305.3.1 Asphalt Mixing Plant

As per Subsection 203.3.1 of these Specifications.

305.3.2 Preparation of Aggregates

Before being fed to the dryer, aggregates for the asphalt concrete shall be separated into two or more sizes and stored separately in cold bins. One bin shall contain aggregate of such size that eighty (80) percent will pass a 2.36 mm sieve and the other bin shall contain aggregate of such size that eighty (80) percent will be retained on the 2.36 mm sieve. Should fine material be incorporated in the mix, a separate bin shall be provided in addition to the two bins mentioned above. If filler is used as a separate component it shall also be stored and measured separately and accurately before being fed into the mixer.

Asphalt cement shall be heated within a temperature range of one hundred and thirty five to one hundred and sixty three (135-163) °C at the time of mixing. All material heated above the maximum shall be considered overheated and shall be rejected and removed from job site.

Dried aggregate weighed and drawn to pug-mill shall be combined with proper amount of asphalt cement according to the job mix formula. The temperature of asphalt, except for temporary fluctuations, shall not be lower than fifteen (15) °C below the temperature of the aggregate, at the time the two (2) materials enter into the pug-mill.

In placing the materials in bins or in moving those from bins to the mixer, any method which causes segregation or uncontrolled combination of material of different grading, shall be discontinued.

Each aggregate ingredient shall be heated and dried at a temperature not to exceed



one hundred and seventy (170) degree centigrade. If aggregates contain sufficient moisture to cause foaming in the mixture or their temperature is in excess of one hundred and seventy (170) degree centigrade, they shall be removed from the bins and returned to their respective stock piles. In no case shall the temperature of an asphalt mix exceed one hundred and sixty five (165) degree centigrade when discharged from the pug-mill.

Immediately after heating, the aggregates shall be screened to required sizes and stored in separate hot bins for batching and mixing with bituminous material.

305.3.3 Hauling Equipment

As per subsection 203.3.3 of these Specifications.

305.3.4 Laying (Spreading)

Unless otherwise directed by the Engineer, where successive layers are to be placed, the surface of existing layer shall be swept, cleaned with a power broom, or by other means as approved by the Engineer, and a tack coat is applied. Tack coat shall not be required between two lifts of Asphalt courses when previous lift is less than one day old.

Asphalt mixture shall be laid using self-contained, power-propelled units. The paver shall be equipped with a receiving hopper having sufficient capacity for a uniform spreading operation. The paver shall be equipped with automatic feed controls, properly adjusted to maintain a uniform depth of material ahead of the screed. It will be provided with an automatically controlled activated screed or strike-off assembly, fitted with heaters, capable of spreading and finishing courses of bituminous plant mix material in lane widths applicable to the specified typical section and uniform thickness, required evenness and texture without tearing, shoving or gouging the mixture shown on the plans. Pavers used for shoulders and similar construction shall be capable of spreading and finishing course of Asphalt plant mix material in widths shown on the plans. The rate of delivery of material to the paver shall be so regulated as to enable the paver to be operated continuously without stoppage to ensure an even and uniform flow of material across full carriageway width, free from dragging or tearing and without segregation of the material.

When laying the mixtures, the paver shall be capable of being operated at forward speeds consistent with satisfactory laying of the mixture. The paver shall be operated at speeds which will give the best result for the type of power being used.

The mixed material shall be delivered to paver in time to permit completion of paving, finishing and compaction of mixture during day light hours.

The paver shall be equipped with automatic screed controls with sensors for either or both sides of the paver, capable of sensing grade from an outside reference line, sensing the transverse slope of the screed and providing the automatic signals



which operate the screed to maintain the desired grade and transverse slope. The sensor shall be so constructed that it will operate from a reference line or a ski-like arrangement. When the finish of the grade prepared for paving is superior to the established tolerance and, when in the opinion of the Engineer, further improvement to the line, grade, cross sections and smoothness can best be achieved without the use of the reference line; a ski-like arrangement may be substituted subject to the approval of the Engineer. The use of the reference lines shall be reinstated immediately whenever the Contractor fails to maintain a superior paving. The Contractor shall furnish and install all pins, brackets, tensioning devices, wire and accessories necessary for satisfactory operation of the automatic control equipment.

The transverse slope controller shall be capable of maintaining the screed at the desired slope within plus or minus 0.1 percent variation.

Manual operation will only be permitted in the construction of irregularly shaped and or minor areas.

Whenever a breakdown or malfunction of the automatic controls occurs, the equipment may be operated manually or by other methods in order to allow the contractor to use the asphalt already produced at the plant or in transit, provided this method of operation will produce results otherwise meeting the Specifications.

Asphalt material which is hotter than one hundred and forty (140) degree centigrade shall not be laid or deposited on bridge deck waterproofing systems unless precautions against heat damage have been agreed by the Engineer.

Asphalt concrete pavement wearing course shall not be placed on any wet or frozen surface, during rain, dust or sand storms, when wind or other weather conditions prevent the proper handling of the Asphalt mixtures or when atmospheric temperature is five (5) degree centigrade or less. Care should be taken during spreading operation under windy condition in winter, even if temperature is above five (5) degree centigrade.

The spreading operations should be immediately terminated if it begins to rain during the operation.

Hand laying of any Asphalt material will be permitted only in the following circumstances:

- a) For laying regulating courses of irregular shape and varying thickness;
- b) In confined spaces where it is impracticable for a paver to operate;
- c) For footways;
- d) At the approaches to expansion joints at bridges or viaducts;



305.3.5 Joints

Longitudinal joints for each course shall be offset thirty (30) centimeters from the joint in the immediate underlying course. Transverse joints shall be offset a minimum of sixty (60) centimeters from the joint of the immediate underlying course.

The Contractor will use either full width paver or two pavers in unison to avoid any longitudinal joints within the pavement width. However, where it becomes unavoidable due to break down of paver, the Contractor will ensure the leading half of half-roadway paving shall not get ahead of the trailing half of the pavement by more than half a kilometer ahead of the trailing half.

Longitudinal joints in wearing course shall, after cutting back, be of good alignment and preferably coincident with the position of carriageway markings. Except where laying in echelon, joints in wearing course shall be cut back to a vertical face and tack coated. Kerb faces, ironwork and the like in contact with wearing course shall be tack coated prior to laying of wearing course.

Longitudinal joints shall be located within fifteen (15) centimeters of the centerline of the roadway or within fifteen (15) centimeters of the centerline of a lane. Longitudinal joints shall be held to the minimum practical number. Longitudinal joints shall be formed by lapping the screed over the first layer placed, crowding a ridge of Asphalt material at the joint and crimping the ridge of material into the joint by a compaction roller while the material is hot.

Transverse joints shall be formed by cutting back the first layer placed to the full depth of the layer, removing and wasting the material, spreading new Asphalt material in sufficient quantity to create a compacted thickness equal to the thickness of the first layer. The joint shall be cross rolled with one coverage and the joint checked with a straight edge not less than four (4) meters in length. High points shall be removed and sags filled with additional Asphalt material and the joint rolled a second time. The joint shall again be checked with a straight edge, humps and sags adjusted as necessary, and rolled until the joint is complete and compacted as specified.

The outer edges of wearing course shall be cut back to a good alignment, parallel with the road alignment. This will require a small additional width of wearing course to be laid and cut back.

No payment shall be paid for this additional width and for all cutting back of wearing course. Tack coating of vertical faces will not be measured for payment.

305.3.6 Preparation of Base or Existing Pavement Surface

Before spreading materials, the surface of base or existing pavement on which the mix is to be placed shall be conditioned by application of a tack coat as specified.

After a tack coat is applied, it shall be allowed to dry until it is in the proper



condition of tackiness to receive the mix. The tack coat shall be applied only as far in advance of the placing of mix, as is necessary to obtain the proper condition of tackiness. Any breaks in the tack coat shall be repaired.

A thin coating of asphalt material shall be sprayed on contact surface of curbing, gutters, manholes, and other structures, prior to the asphalt mixture being placed against them.

305.3.7 Rollers

Rollers shall be steel wheel, pneumatic tyred and vibratory, or a combination thereof. The roller(s) shall be in good condition, capable of reversing without backlash, and shall be operated at speeds slow enough to avoid displacement of the asphalt mixture. The number and weight of rollers shall be sufficient to compact the mixture to the required density while it is still in a workable condition. Vibratory rollers shall be acceptable for asphalt mixture compaction. The use of equipment, which results in excessive crushing of aggregate, will not be permitted.

305.3.8 Compaction

Asphalt material shall be laid and compacted in layer thicknesses which enable surface level and regularity requirements to be met and adequate compaction to be achieved. The maximum thickness of wearing course material laid in one pass of the paver shall be 5 cm.

When production of the mixture can be maintained and wherever practical, pavers shall be used in echelon to place the wearing course in adjacent lanes and compacted to form a surface without lateral joint.

All mixtures shall be spread at a temperature of not less than one hundred and forty five plus/minus five (145 + 5) degree centigrade.

Material shall be uniformly compacted as soon as rolling can be effected without causing undue displacement of the mixed material and shall be substantially completed while the temperature of the mixed material is greater than hundred twenty (120) degree centigrade. Rolling shall continue until all roller marks have been eliminated from the surface.

The density achieved shall be not less than 97 percent of the Marshall Density of each day's production.

Relevant test methods for density of bituminous concrete in place by Nuclear Methods such as ASTM D 2950 (latest version) and or other method as directed by the Engineer shall be used to establish the proper rolling effort and pattern to achieve the required density and to ensure achieving the specified percent compaction during the placement of the bituminous concrete as quality control testing. A calibration factor for the Nuclear Method must be established as per the equipment's manufacture's requirements, and at any time a change is made in the



paving mixture, in construction process or after every fifteen days of asphalt production whichever is earlier. Compare the results obtained to samples compacted to Marshall Density to determine percentage of compaction.

Compaction shall be carried out using 8-10 tonne dead weight smooth wheeled rollers or by multi-wheeled pneumatic tyred rollers of equivalent mass, or by vibratory rollers or a combination of these. Wearing and base courses material shall always be surface finished with a smooth wheeled roller which may be a dead weight roller or alternatively a vibratory roller in non-vibrating mode. Vibratory rollers shall not be used in vibrating mode on bridge decks.

Vibratory rollers may only be used if they are capable of achieving at least the standard of compaction of 9-tonne dead weight roller to meet the specified percent compaction of Marshall Max. Density, and shall be equipped or provided with devices indicating the frequency at which the mechanism is operating and the speed of travel which can be read from the ground.

Three steps of rolling are as follows:

i) Breakdown Rolling

Breakdown Rolling may be accomplished with static or vibratory steel-wheeled rollers.

It is important to start the rolling operation on the low side of the mat (usually the outside of the lane being paved) and progress toward the high side. The reason is that hot mixtures tend to migrate toward the low side of the mat during compaction. If rolling is started on the high side, migration is much more pronounced than if rolling starts from the low side. When adjoining lanes are placed, the same rolling procedure should be followed but only after compaction of the longitudinal joint.

ii) Intermediate Rolling

Intermediate rolling should follow breakdown rolling as closely as possible, while the asphalt mix is still well above the minimum temperature at which densification can be achieved.

Intermediate rolling should be continuous until all of the mix placed has been thoroughly compacted. Regardless of the type of rollers used, the rolling pattern should be developed in the same manner as for breakdown rolling.

iii) Finish Rolling

Finish rolling is done solely for the improvement of the surface. It should be accomplished with steel-tired, static-weight tandems or vibratory tandems without vibration while the material is still warm enough for removal of roller marks.



The material shall be rolled in a longitudinal direction with the driven rolls nearest the paver. The roller should first compact the material adjacent to any joints and then work from the lower to the upper side of the layer overlapping on successive passes by at least half the width of the rear roll or in the case of a pneumatic tired roller, at least the nominal width of one tyre.

The smoothness of the surface and its good acceptable ride-ability as specified shall be adhered. Following points need special attention:

- a) Variation in the surface on which the asphalt course is laid shall be free from variations and be well within the allowable tolerances.
- b) The asphalt laid through the pavers will be checked immediately after initial rolling and defects will be rectified as required.
- c) Frequent stopping/starting of paver is not allowed. Paver speed should be adjusted to average rate of delivery of material, even if some trucks are delayed in dumping loads. If stop cannot be avoided, the section of pavement at the location of stop should be checked by straightedge before and after compaction.
- d) Joint should be checked with a straightedge immediately after construction and corrections made while the material is still hot. All corrections should be made with a lute. Rakes should be used only for loosening material. Poor joints must be corrected immediately, later grinding of high spots is a poor substitute for proper construction.
- e) The paver should be adjusted so that back casting of fill in low spots is not required.
- f) Irregular rolling or letting the roller stand on hot pavement is not allowed.
- g) Non-uniform asphalt mixture shall not be allowed.
- h) Pulling of mat by screed of the paver is not allowed. This results in regularly spaced, very small, cracks in mat. The compacted mat is thinner in the vicinity of cracks due to lack of material, resulting in a corrugated surface.
- i) If the truck brakes are set too hard or the paver is bumped by a truck, irregularities occur. Truck should stop before hitting the pavers.
- j) Non-uniform temperature of material is not allowed. Cold loads do not compact to the same thickness as hot loads. The temperature of each load should be checked for uniformity as per specifications before dumping.
- k) Frequent adjustment of screed controls is undesirable. Sometimes paver crews constantly change the screed controls manually in order to maintain a uniform thickness. The result is poor riding quality.



- l) Ridability of the paved surface shall be checked regularly as per 305.3.10.2.

305.3.9 Trial Areas

At least 3 days before material from each source of the asphalt concrete is first laid in the Works, the Contractor shall lay a trial area to demonstrate the compaction plant and rolling procedure selected by him for achieving the specified density.

- a) The trial shall be not less than 200 m in length and of a width to be approved by the Engineer. If the trial area complies with these Specifications it may form part of the permanent Works;
- b) For the trial the Contractor shall use the materials, mixing and laying plant proposed for the main works.

Where the required level of compaction is not achieved the trial area shall be removed and the trial repeated.

The Engineer shall approve test results and general performance of test area before actual commencement of the work.

305.3.10 Surface Tolerances

Surface Test by Straightedge

After completion of final rolling, the finished surface shall be tested for smoothness with five (5) meters straightedge by the Engineer at selected locations. The variation of surface from testing edge of straight edge between any two (2) contacts shall be determined by placing it parallel and perpendicular to centerline of roadway and value thus determined should not vary more than limits prescribed by "Table for Allowable Tolerances" in these Specifications.

Removing and Replacing

Corrections may also be made by removing the defective asphalt layer and replacing it by asphalt concrete meeting the specified requirements.

305.3.10 Wearing Course Thickness Tolerance

The asphalt concrete wearing course shall be compacted to the desired level and cross slope as shown on the drawing or as directed by the Engineer.

The tolerances in compacted thickness of the wearing course shall be ± 3 mm from the desired thickness shown on the drawings. For determination of thickness one (1) core per hundred meters of each lane will be taken. If the thickness so determined is deficient by more than three (3) mm, but not more than ten (10) mm, payment will be made at an adjusted price as specified in Table-1, clause 305.4.2.(2) of these Specifications.

The surface of the wearing course shall be tested by the Engineer using a 5 meters



straightedge at selected locations. The variation of the surface from the testing edge of the straightedge between any two contacts, longitudinal or transverse with the surface shall at no point exceed four (4) millimeters. The cross fall (camber) shall be with ± 0.2 percent of that specified, and the level at any point shall be within \pm three (3) mm of the level shown on the Drawings. All humps or depressions exceeding the specified tolerance shall be corrected by removing the defective work and replacing it with new material, by overlaying, or by other means satisfactory to the Engineer.

305.3.11 Acceptance of Sampling and Testing

The Engineer shall perform or supervise the performance of all quality assurance sampling and testing. The location of all samples and tests shall be recorded by roadway, lane and centerline station (kilometer).

Acceptance of sampling and testing for this item with respect to materials and construction requirements, not specified herein, shall be in accordance with the relevant "Tables for Sampling and Testing Frequency" in these Specifications.

305.3.12 Surface Smoothness

The completed asphalt wearing course shall be compacted as specified, smooth, free from ruts, humps or depressions, or irregularities. Any ridges, indentations, roller checking, or other objectionable marks left in the surface, as determined by the Engineer, shall be eliminated by whatever means are necessary and approved by the Engineer. The use of any equipment that leaves ridges, indentations or other objectionable marks shall be discontinued.

Allowable tolerances for riding quality/smoothness of finished asphalt concrete wearing course are stated in "Table for Allowable Tolerances" and Subsection 305.3.10 in these Specifications.

Frequency of Testing of Cores for Compaction

As per Subsection 203.3.9 of these Specifications.

305.4 MEASUREMENT AND PAYMENT

305.4.1 Measurement

The quantity of asphalt concrete wearing course shall be measured by volume in cubic meters laid and compacted in place. Measurements shall be based on the dimension as shown on the Drawings or as otherwise directed or authorized by the Engineer. No measurement shall be made of unauthorized area or extra thickness. Quantities of material wasted or remaining on hand after completion of the work shall not be measured or paid for.

Any asphalt additive used shall not be paid directly. Its payment shall be deemed to be included in the respective pay item of Asphalt Concrete Wearing Course.



305.4.2 Payment

- 1) The quantity determined as provided above shall be paid for at the contract unit price respectively for each of the particular pay items listed below and shown in the Bill of Quantities, which prices and payment shall constitute full compensation for all the costs necessary for the proper completion of the work prescribed in this item. Asphalt additive or anti-stripping agent, if allowed and used to meet with JMF requirement shall not be paid directly, payment shall be deemed to be included in the respective pay items of Asphaltic wearing course.

- 2) **Price adjustment:** If the thickness determined as per clause 305.3.11 of this specification is deficient by more than three (3) mm, but not more than ten (10) mm, payment will be made at an adjusted price as specified in Table-1 below:

Table - 1

Deficiency in thickness as determined by cores	Proportional Rate of contract Price allowed
0.0 mm to 3.0 mm	100%
3.1 mm to 5.0 mm	90%
5.1 mm to 10.0 mm	80%

When wearing course is more than ten (10) mm deficient in thickness, the contractor shall remove such deficient areas and replace them with wearing course of an approved quality and thickness or the Contractor may opt to place an additional layer of wearing course asphalt, grading with a minimum thickness of 35 mm. The Contractor will receive no compensation for the above additional work.

Pay Item No.	Description	Unit of Measurement
305a	Asphalt Wearing Course Class A	CM



ITEM 401 CONCRETE

401.1.2 TYPES OF CONCRETE

“On Ground Concrete”

In line one (1) add “minimal” after erecting. Add at the end “However walls for culvert shall be considered in elevated concrete”.

401.4 MEASUREMENT AND PAYMENT

401.4.1 Measurement

In para three (03) add at the end “against per cu.m of concrete”.



SPECIAL PROVISIONS

SP-413 POLYTHENE SHEET

413.1 DESCRIPTION

The Contractor shall supply and lay polythene sheet under floors/Rigid Pavement etc. of specified thickness as directed by the Engineer.

413.2 MATERIALS

The polythene sheet shall be at least 500 gauge (.005" thick).

413.3 CONSTRUCTION

Special care should be taken while laying polythene sheet, to avoid any puncture/holes due to construction works. Overlaps of at least 2 Ft. shall be provided, where required.

413.4 MEASUREMENT

The quantity to be paid for under this item will be in square meter in accordance with the plans and specifications and as directed by the Engineer.

413.5 PAYMENT

The unit price bid per linear meter shall include the cost of furnishing and placement including all labor, materials and equipment necessary to complete the work.

Item No.	Description	Unit of Measurement
SP-413	Supplying and laying polythene sheet over D.P.C under floors and on roofs. etc. ii) 500 gauge (.005" thick)	SM



SP-414 REBAR CHEMICAL ANCHOR

414.1 DESCRIPTION

The work shall consist of supply, fabrication and installation of rebar chemical anchor of required size, including all required plants, equipment, materials and testing, at locations as shown on drawings and as per specification or as directed by the Engineer complete in all respect. Before execution of work, the Contractor shall submit his Method statement with all of the relevant approvals and material certifications etc. for approval of the Engineer.

414.2 MATERIALS

414.2.1 Chemical for Rebar Anchor

Anchoring Chemical shall be epoxy resin provided by the supplier/contractor approved by the Engineer. Product shall minimum have European Technical Assessment (ETA) approval. The compressive, tensile and flexure strength of epoxy resin shall conform to ASTM D695, ASTM D638 and ASTM D790 respectively. Approved supplier/contractor shall submit detail design of chemical rebar anchor for approval of the Engineer before execution at site.

414.2.2 Rebar Anchor

Rebar shall be minimum Grade-60 conforming to Item No.404 of NHA General Specification.

414.3 CONSTRUCTION

Approved supplier/contractor shall submit complete construction methodology to the Engineer for approval before execution at site which shall satisfy at least following minimum requirements.

414.3.1 Location of Anchor

Location of the rebar chemical anchor shall be as per provided drawings and supplier/contractor shall confirm it at site by using appropriate equipment to avoid any damage to the existing reinforcements. A detailed methodology shall be submitted for the Engineer's approval before execution at site. Any damaged existing concrete surface which is not



suitable for installation of rebar chemical anchor shall be identified in the method statement.

414.3.2 Bore Hole Drilling

At approved location of the rebar chemical anchor, suitable drilling techniques i.e. hollow drill bit, hammer drilling and/or diamond coring shall be used to drill the hole to the required approved embedment depth and size without causing any damage to the existing concrete.

All drilled holes shall be free from dust and debris before injection of the chemical. Appropriate methods of cleaning like, vacuum cleaning, manual brush and pump cleaning and/or compressed air/water cleaning techniques whichever is appropriate/approved are used unless return air/water stream is free of noticeable dust below/spill out.

414.3.3 Injection of the Chemical

Approved chemical dispenser shall be used for injection of the chemical to the hole. Approved chemical foil pack shall be placed in the dispenser which shall automatically open when the dispensing is initiated. Discard the initial adhesive of the pack as per the size of the foil pack as recommended by the manufacturer. Inject the chemical starting at the end of the drilled hole by slowly with drawing the dispenser mixer with each trigger pull. For overhead installation or for deeper embedment depth, aid of the extension of piston plug to dispenser is required for proper chemical injection.

Fill holes hole approximately minimum 2/3 full and completely full in underwater conditions. It is required that annular gap between the rebar and the concrete is completely filled with chemical along the embedment depth. After injection is complete, depressurized the dispenser by pressing the release trigger to prevent any wastage of the chemical.

414.3.4 Placement of Rebars

An element is installed, which shall be free from oil and other contaminations, which shall ensure correct alignment and embedment depth of the rebars within the approved working time of the chemical. Rebar shall be loaded in the hole through the installed element after the required curing time of the chemical, by applying torque or approved method.



414.3.5 Pullout Test

At least one pullout test conforming to ASTM C900, of the chemical rebar anchor shall be carried out at the design stage of the anchor in presence of the Engineer/Engineer representative. Approved design shall be executed at site and two numbers of chemical rebar anchor installed at the actual site location shall be tested or as decided by the Engineer.

414.4 MEASUREMENT AND PAYMENTS

414.4.1 Measurement

The quantity to be paid under this item will be in the numbers of the completed anchors in accordance with the approved design, drawings and specifications and as directed by the Engineer.

414.4.2 Payments

The accepted quantity measured as provided above shall be paid for the contract unit prices respectively for the pay items listed below and shown in the Bill of Quantities which price and payment shall be full compensation for supply, fabrication and installation of rebar chemical anchor of required size, including all required plants, equipment, materials, testing and incidentals necessary to complete the item.

Pay Item No.	Description	Unit of Measurement
SP-414	Rebar Chemical Anchoring for new and old Structure	Each



SP-415 SONIC INTEGRITY TESTS (SIT) ON ALL PILES

415.1 SONIC INTEGRITY TESTS (SIT)

All working piles shall be subjected to Sonic Integrity Testing (SIT) by a specialist agency engaged by the Contractor. The SIT equipment like FPDS (Foundation Pile Diagnostic System) or equivalent, as approved by the Engineer, shall be used for this purpose. The testing shall be done as per ASTM D5882-07. Before starting this testing, the Contractor shall submit his Method statement for approval of the Engineer.

The contractor shall arrange performance and interpretation of these tests by the specialist agency like TNO Netherlands or equivalent. The interpretation shall include information on pile length, concrete crushing strength, Sonic Pulse Velocity and defects like necking / honeycombing etc. A separate report shall be submitted for SIT carried out on piles by the Contractor.

415.2 PAYMENT

Item No.	Description	Unit of Measurement
SP-415	Sonic Integrity Tests (SIT) on all piles	Each



SP- 416 GALVANIZED IRON DRAIN PIPE

416.1 DESCRIPTION

The Contractor shall furnish and place galvanized iron drain pipe (AASHTO Standards M 1118-80 1986) in accordance with the plan of Bridge deck, specifications and/or as ordered by the Engineer.

416.2 MATERIALS

The Galvanized iron pipe shall conform to the requirements of ASTM Designation A120.

416.3 CONSTRUCTION

Where the pipe is used for bridge drains it shall be cast in the deck and shall be flush with the deck surface.

416.4 MEASUREMENT

The quantity to be paid for under this item will be number of linear meter of pipe incorporated in the work in accordance with the plans and specifications and as directed by the Engineer.

416.5 PAYMENT

The unit price bid per linear meter shall include the cost of furnishing and placement including all labor, materials and equipment necessary to complete the work.

Item No.	Description	Unit of Measurement
SP-416	GI drain pipe Dia 100 mm	M



SP-417 BITUMEN COATING

417.1 Scope

The work under this section of the Specifications consists of furnishing all plant, labour, equipment, appliances and materials and in performing all operations related to water proof treatment to foundations and basement structures complete in strict accordance with this section of the specifications and the applicable drawings and subject to the terms and conditions of the Contract.

417.2 Submittal

Samples of all materials proposed for use under this section shall be submitted to the Engineer for approval.

417.3 Materials

Bitumen 10/20 grade.

417.4 Delivery Storage and Handling

Materials shall be protected from damage during loading shipment delivery and storage. Non-staining materials shall be used for blocking and packing.

417.5 Preparatory Work

All surfaces to be treated shall be dust free and dry. Application of finishes shall not start unless the preparatory work has been inspected and approved by the Engineer.

417.6 Bitumen Coating / Painting In Foundation Sub-Structures, Under Floors

Bitumen Painting

All surfaces to be bitumen painted shall be thoroughly cleared of any accretion, dust, dirt etc. by scraping, wire brushing or as directed by the Engineer. The surface shall be primed with a coat of asphalt oil used at the rate of not less than 0.5 liters per square meter. Two coats of hot bitumen paint shall be applied at the rate of 4.5 kg/Sq.m each coat. The first coat shall be allowed to dry for about 6 hours before applying the second coat. During operation of painting great care shall be taken to avoid air bubbles. The manufacturer's instructions shall be followed.

417.7 Measurement and Payment

417.7.1 Measurement

Measurement for compliant completed works will be made on the basis of actual area coated in square meter as shown on drawings or as directed by the Engineer. All openings left in area shall be deducted.



417.7.2 Payment

Payment will be made for agreed measured quantity of work on the basis of unit rate per square meter quoted in the Bills of Quantities and shall constitute full compensation for all the works related to the item.

Pay Item No	Description	Unit of Measurement
SP-417	Bitumen coating to plastered or cement concrete surface: -	SM



SP-418 REMOVAL OF RUST FROM EXPOSED STEEL BARS, APPLICATION OF PROTECTIVE COATING AND PRESSURIZED EPOXY GROUTING FOR EXISTING DAMAGE CONCRETE WITH FAIR SURFACE FINISHED

418.1 DESCRIPTION

The work shall consist of supply, fabrication, installation, including all required plants, equipment, materials and testing required for the restoration of structural integrity and resistance to moisture penetration of existing cracked concrete by pressurized epoxy grout at all identified locations with approved surface finish or as directed by the Engineer complete in all respect. Before execution of work, the Contractor shall submit his Method statement with all of the relevant approvals and material certifications etc. for approval of the Engineer.

418.2 MATERIALS

418.2.1 EPOXY FOR PRESSURIZED GROUTING

Chemical for pressurized grouting shall be epoxy resin provided by the supplier/contractor approved by the Engineer. Product shall conform to ASTM C881, "Standard Specification for Epoxy Resin Base bonding system for concrete". If the crack is damp and cannot be dried, epoxy tolerant to moisture shall be used.

The appropriate viscosity of the epoxy will depend on the crack size, thickness of the concrete section, and injection access. For crack widths 0.010 in. (0.3 mm) or smaller, use a low-viscosity epoxy (500 cps or less). For wider cracks, or where injection access is limited to one side, a medium to gel viscosity material may be more suitable.

ASTM C 881, "Standard Specification for Epoxy-Resin Base Bonding Systems for

Concrete," identifies the basic criteria for selecting the grade and class of epoxies

(see Table 1). For concrete Sections greater than 12in. (305 mm), the working time may need to be increased, and the viscosity decreased, as the crack gets smaller.

In addition to the criteria used in Table 1 for epoxy selection, the following product

Characteristics shall also be considered:

- Modulus of elasticity (rigidity);



- Working life;
- Moisture tolerance;
- Color; and
- Compressive, flexural, and tensile strengths.

Table 1—ASTM C 881 requirements for epoxy resins that are used to bond hardened concrete to hardened concrete

	Type I*	Type IV†
Viscosity, centipoise		
Grade 1 (low-viscosity), maximum	2000	2000
Grade 2 (medium-viscosity), minimum	2000	2000
Maximum	10,000	10,000
Consistency, in.		
Grade 3 (non-sagging), maximum	1/4	1/4
Gel time, min.	30	30
Bond strength, minimum, psi		
2 days, moist cure‡	1000	1000
14 days, moist cure	1500	1500
Absorption, 24 h maximum, %	1	1
Heat deflection temperature		
7 days minimum, °F	—	120
Linear coefficient of shrinkage		
On cure, maximum	0.005	0.005
Compressive yield strength		
7 days minimum, psi	8000	10,000
Compression modulus, minimum, psi	150,000	200,000
Tensile strength, 7 days minimum, psi	5000	7000
Elongation at break, minimum, %	1	1

*Type I: for use in non-load-bearing applications.

†Type IV: for use in load-bearing applications.

Source: ASTM C 881, Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.

‡Moist-cured systems should be tested by assembling the sections to be bonded before immersing in water.



418.3 CONSTRUCTION

Approved supplier/contractor shall submit complete construction methodology to the Engineer for approval before execution at site which shall satisfy at least following minimum requirements.

418.3.1 LOCATION OF CONCRETE CRACKS AND CRACK ASSESSMENT

Location of all concrete cracks shall be identified at site by using all required equipment and machinery or as directed by The Engineer. All of the these identified concrete cracks shall be assessed by appropriate means for further widening under service load. If the cracks are active then The Engineer shall decide the method of restoration.

Approved supplier/contractor shall submit a detailed methodology for location of concrete cracks and crack assessment for the Engineer's approval before execution at site.

418.3.2 SURFACE PREPARATION

Surface shall be cleaned for area about 1/2 in. (13 mm) wide on each side of the crack. This shall be done to ensure that materials used to seal the top of the crack (the cap seal) will bond properly to the concrete. Wire brushing is recommended because mechanical grinders may fill the cracks with unwanted dust. Contaminants shall also be removed by high-pressure water, "oil-free" compressed air, or power vacuums. When using water to clean out the crack, blow out the crack with oil-free, compressed or heated air to accelerate drying. Otherwise, allow enough time for natural drying to occur before injecting moisture-sensitive epoxies. Where concrete surfaces adjacent to the crack are deteriorated,

"V"-groove the crack until sound concrete is reached. "V" grooves can also be used when high injection pressures require a stronger cap seal.

418.3.3 EQUIPMENT

Following is the list of minimum equipment for epoxy injection by high-pressure or low-pressure systems, however contractor/supplier shall submit its detail list of equipment with methodology for approval of the Engineer:

- Air guns;



- Hand-actuated delivery systems;
- Spring-actuated capsules; and
- Balloon-actuated capsules.

Determine the delivery method that will best suit the repair requirements by considering the size and complexity of the injection repair and the economic limitations of the project or as directed by The Engineer.

418.3.4 PORT INSTALLATION

Entry ports shall only be installed after proper surface preparation. There are two types of entry ports for the injection process:

- Surface-mounted; or
- Socket-mounted.

Entry ports (also called port adapters) shall be any tube like device that provides for the successful transfer of the epoxy resin under pressure into the crack. Proprietary injection guns with special gasketed nozzles are also available for use

without port adaptors. Port spacing shall typically be 8 in. (40 mm) on center, with increased spacing at wider cracks. Port spacing may also be a function of the thickness of the concrete element. Surface-mounted entry ports are normally adequate for most cracks, but socket-mounted ports are used when cracks are blocked, such as when calcified concrete is encountered. Entry ports can also be connected by a manifold system when simultaneous injection of multiple port locations is advantageous. The method for injection the epoxy shall be approved the Engineer before execution at site.

418.3.5 INSTALLATION OF CAP SEAL

The cap seal shall be properly installed, contains the epoxy as it is injected under pressure into the crack. When cracks penetrate completely through a section, cap seals perform best when installed on both sides of the cracked element, ensuring containment of the epoxy. Material of Cap seals shall be epoxies, polyesters, paraffin wax, and silicone caulk.

The selection of the cap seal material should consider the following criteria, subject to the type of crack to be repaired:

- Non-sag consistency (for vertical or overhead);
- Moisture-tolerance;



- Working life; and
- Rigidity (modulus of elasticity).

Concrete temperature changes after installation of the cap seal but prior to injection may cause the cap seal to crack. If this occurs, the cap seal must be repaired prior to resin injection. Prior to proceeding with installation of the cap seal, mark the location of the widest portion of the crack and pay close attention to the following:

- Use only materials that haven't exceeded their shelf life;
- Accurate batching of components;
- Small batches to keep material fresh, and dissipate heat;
- Port spacing; and
- Consistent application of the material (1 in. wide x 3/16 in. thick [25 x 5 mm]) over the length of the crack.

The cap seal shall be approved by the Engineer before execution at site.

418.3.6 INJECTION OF THE EPOXY

For a successful epoxy injection, start with the proper batching and mixing of the epoxy components in strict accordance with the approved manufacturer's requirements. Prior to starting the actual injection, be sure that the cap seal and port adapter adhesive shall be properly cured so they can sustain the injection pressures. Start the injection at the widest section of a horizontal crack. (Be sure to locate and mark these areas before installing the cap seal.) Vertical cracks are typically injected from the bottom up. Continue the injection until refusal. If an adjacent port starts bleeding, cap the port being injected and continue injection at the furthest bleeding port. Hairline cracks are sometimes not well suited to "pumping to refusal." In those cases, try injecting the epoxy at increased pressure (approximately 200 psi [1.3 MPa]) for 5min. Closer port spacing can also be considered.

When injection into a port is complete, cap it immediately. Higher pressure can be used for injecting very narrow cracks or increasing the rate of injection. However, the use of higher pressure should be managed with care to prevent a blowout of the cap seal or ports.

418.3.7 REMOVAL OF CAP SEAL

Upon completion of the injection process, remove the ports and cap seal by heat, chipping, or grinding. If the appearance is not objectionable to the client, the cap seal can be left in place. If complete removal is required for a subsequent application of a cosmetic coating, prepare the concrete surface by grinding.



418.3.8 TESTING

To ensure that the injection has been successful, quality assurance measures may include test cores or nondestructive evaluation (NDE).

1. Test Cores:

- Core locations should be chosen to avoid cutting reinforcing steel, drilling cores in areas of high stress, or creating core holes below the waterline. The engineer should determine core locations when these types of conditions exist;
- Be sure the epoxy has set before extracting a core;
- Take cores (normally 2 in. [50 mm] diameter) to check that the penetration of the epoxy is adequate;
- Inspect the core visually to determine the penetration of the epoxy into the crack;
- Cores can be further tested for compressive and split tensile strength per ASTM C 42; and
- Subsequently, patch the removed-core area (after proper surface preparation) with an expansive cementitious or epoxy grout compatible with the existing substrate concrete and the surrounding environment.

2. Methods for nondestructive evaluation:

- Impact echo (IE);
- Ultrasonic pulse velocity (UPV); and
- Spectral analysis of surface waves (SASW).

The extent and scope of testing shall be finalized and approved by the Engineer.

418.3.9 SURFACE FINISH

Following method shall be used for surface finish for spalled faces of the repaired concrete or as directed by the Engineer.

1. Spall repair by low pressure spraying conforming to ACI RAP Bulletin-3



2. Surface repair by using Form and Pour Technique conforming to ACI RAP Bulletin-4, reported by ACI Committee E-706.

418.4 MEASUREMENT AND PAYMENTS

418.4.1 MEASUREMENT

The quantity to be paid under this item will be by area (Sq.M) of the repaired surface in accordance with the approved specifications and methodology and/or as directed by the Engineer.

418.4.2 PAYMENTS

The accepted quantity measured as provided above shall be paid for the contract unit prices respectively for the pay items listed below and shown in the Bill of Quantities which price and payment shall be full compensation for supply, fabrication, installation, including all required plants, equipment, materials and testing required for the restoration of structural integrity and resistance to moisture penetration of existing cracked concrete by pressurized epoxy grout at all identified locations with approved surface finish and incidentals necessary to complete the item.

Pay Item	Description	Unit of Measurement
SP-418	Removal of rust from exposed steel bars, application of protective coating and pressurized epoxy grouting for existing damage concrete with fair surface finished	S.M



SP-419 PAINTING

419.1 SCOPE

The work under this section of the Specifications consists of furnishing all materials, plant, labour, equipment, appliances and performing all operations in connection with surface preparation, mixing, painting concrete works, Metalworks, Structural steel, and all such surfaces as shown on the Drawings and/or as directed by the Engineer. The scope of this section of specification is covered with detailed specifications as laid down herein.

419.2 APPLICABLE STANDARDS

Latest editions of following British Standards are relevant to these specifications wherever applicable.

BSI (British Standards Institution)

245	Specification for mineral solvents (white spirits and related hydrocarbon solvents) for paints and other purposes.
2523	Lead based priming paint for iron and steel.
2569	Sprayed metal coatings.
CP.3012	Cleaning and preparation of metal surfaces.

419.3 GENERAL

419.3.1 Except as otherwise specified, all painting shall be applied in conformity with BS CP 231 "Painting of Building" as applicable to the work.

419.3.2 The Contractor shall repair at his own expense all damaged or defective areas of shop-painted metal work and structural steelwork. Metal surfaces against which concrete is to be placed will be furnished shop-painted and shall be cleaned prior to being embedded in concrete.

419.3.3 Except as otherwise specified, all concrete and plastered surfaces are to be painted.

419.3.4 The Engineer will furnish a schedule of colours for each area and surface. All colours shall be mixed in accordance with the manufacturer's instructions.

419.3.5 Colours of priming coat (and body coat where specified, shall be lighter than those of finish coat. The Engineer shall have unlimited choice of colours.



419.3.6 Samples of all colours, and finishes shall be prepared in advance of requirement so as not to delay work and shall be submitted to the Engineer for approval before any work is commenced. Any work done without such approval shall be redone to the Engineer's satisfaction, without additional expense to the Employer. Samples of each type of paint shall be on separate 300 x 300 x 3 mm tempered hard board panels. Manufacturer's colour chart shall be submitted for colour specifications and selection.

419.4 MATERIALS

419.4.1 All materials shall be acceptable, proven, first grade products and shall meet or exceed the minimum standards of reputable manufacturers as approved by the Engineer.

419.4.2 Colours shall be pure, non-fading pigments, mildew-proof sun-proof, finely ground in approved medium. Colours used on-plaster and concrete surfaces shall be lime-proof. All materials shall be subject to the Engineer's approval.

419.4.3 All synthetic enamel paints and primers for structural steel works, metal work, will be the best available of its type and shall be approved by the Engineer prior to its procurement.

419.4.4 Unless otherwise specified on Drawings approved quality Durocem/snowcem paint or approved equivalent shall be used for painting the exteriors of the structures or other surfaces and/or as directed by the Engineer.

419.4.5 The plastic emulsion/weather shield/ vinyl emulsion paint or similar as approved by the Engineer shall be used for interior surfaces.

419.4.6 Fire resistant painting shall be proprietary painting material to be applied in conformity with the recommendations and instructions of the manufacturers.

419.4.7 Where ever Multi-colour paint coating for interior is specified ZOLA COAT or equivalent as approved by the engineer is to be used. Painting shall be proprietary painting material to be applied in conformity with the recommendations and instructions of the manufacturers.

419.4.8 Where ever Textured roll on paint for interior is specified, ICI, Dulux or equivalent as approved by the Engineer to be used . Painting shall be proprietary painting material to be applied in conformity with the recommendations and instructions of the manufacturers.

419.4.9 All material shall be delivered to site in their original unbroken containers or packages and bear the manufacturer's name, label, brand and formula and will be mixed and applied in accordance with manufacturer's recommendations.



419.5 DELIVERY STORAGE AND CONTAINER SIZES

Paints shall be delivered to the site in sealed containers which plainly show the type of paint, colour (formula or specifications number) batch number, quantity, date of manufacture, name of manufacturer and instructions for use. Pigmented paints shall be supplied in containers not larger than 20 liters. All materials shall be stored under cover in a clean storage space which should be accessible at all times to the Engineer. If storage is allowed inside the building, floors shall be kept clean and free from paint spillage.

419.6 SURFACE PREPARATION

419.6.1 All oil, grease, dirt, dust, loose mill scale and any other foreign substance shall be removed from the surface to be painted, polished and white washed by the use of a solvent and clean wiping material. Following the solvent cleaning, the surfaces shall be cleaned by scrapping, chipping, blasting, wire brushing or other effective means as approved by the Engineer.

419.6.2 In the event the surfaces become otherwise contaminated in the interval between cleaning and painting, recleaning will be done by the Contractor at no additional cost.

419.6.3 Surfaces of stainless steel, aluminium, bronze, and machined surfaces adjacent to metal work being cleaned or painted shall be protected by effective masking or other suitable means, during the cleaning and painting operations.

419.6.4 All the surfaces to be painted with approved quality paint or approved equivalent shall be free from dust, dirt, fungus, lichen, algae etc. Oil paint, varnish and lime wash should always be removed by scraping and washing.

419.6.5 No work in this section shall be allowed until all surfaces or conditions have been inspected and approved by the Engineer.

419.7 APPLICATION

All paint and coating materials shall be in a thoroughly mixed condition at the time of application. All work shall be done in a workman like manner, leaving the finished surface free from drips, ridges, waves, laps, and brush marks. All paints shall be applied under dry and dust free conditions. Unless approved by the Engineer paint shall not be applied when the temperature of the metal or of the surrounding air is below 7 degrees centigrade. Surfaces shall be free from moisture at the time of painting.



All primary paint shall be applied by brushing. The first coat of paint shall be applied immediately after cleaning. When paint is applied by

spraying, suitable measures shall be taken to prevent segregation of the paint in the container during painting operation.

Effective means shall be adopted for removing all free oil and moisture from the air supply lines of the spraying equipment.

Each coat of paint shall be allowed to dry or harden thoroughly before the succeeding coat is applied. Surfaces to be painted that will be inaccessible after installation shall be completely painted prior to installation.

Two coats of weather shield paint shall be applied in accordance with the manufacturer's instructions or as directed by the Engineer.

Only as much material should be mixed as can be used up in one hour. Over-thinning will not be permitted. After the first coat the surfaces will be soaked evenly four or five times and the second coat shall be applied after leaving for at least overnight.

419.8 FINISHES

The finished coating film shall show uniform coverage throughout and shall be reasonably free from brush marks, runs, sags, or noticeable colour variations. Edges where coating ends, change colour or change thickness shall be clean and straight.

The completed coating shall be compared with sample areas. The completed coating shall be at least as smooth (free from orange peel effect, overspray, embedded or partially embedded particles, craters, pinholes, holes, etc.) as the approved sample areas.

The thickness of the coating shall be checked by the Engineer at random locations by cutting out sections on concrete and plaster surfaces. The cut out sections shall be patched by the Contractor, using the same material and thickness used originally. Porosities shall be marked and patched with the basic primer material, or with a mixture of the basic primer material and finely divided filler, or with a proprietary patching compound compatible with the coating. Any moisture on the surface of the coating shall be allowed to dry thoroughly before patching. In addition, all porosities and imperfections which become evident after applying subsequent coats shall be repaired. This repairing shall be done with the basic coating material or with a proprietary patching compound compatible with the specified coating, except for the top coat, where only basic coating material shall be used. The completed coating shall be free of porosity visible to the naked eye.



419.9 JOB CONDITIONS

419.9.1 Observe manufacturer's recommended minimum and maximum temperature but do not apply paint or finish to any surface unless ambient temperature is 10 degree C or above and less than 43 degree C. No painting shall be done above 90% relative humidity.

419.9.2 Place drop cloths to adequately protect all finished work.

419.9.3 In no case shall any finish hardware or other finished item that is already fitted into place be painted, unless otherwise specified.

419.10 QUALITY ASSURANCE

All paint for any one surface shall be top quality, of one manufacturer and approved by the Engineer. Deep tone accent colours shall be used and the unavailability of final coat colours may be the basis for rejecting materials for any one surface.

419.11 SCHEDULE OF MEASUREMENT OF PAINT AREA :

Irrespective of prime coats and number of paint coats applied to exposed painting surface area of column, walls, projections; ceilings and other surfaces (Except gates, doors windows and ventilators the cost thereof shall be deemed to have been included in quoted unit rate of the respective items of Bill of Quantities) shall be measured as per actual paint surface area for single time only and paid in accordance with quoted rate of Bill of Quantities

419.12 MEASUREMENT AND PAYMENT

419.12.1 General

419.12.1.1 Measurement for payment purposes shall be made against the respective item(s) of works given in the Bill of Quantities which have been completed in-accordance with the Scope of Works specified in this Section.

419.12.1.2 The item rates quoted by the Contractor shall be deemed to include full compensation of works executed at any floor and at any height except where otherwise specifically stated in the relevant item of the Bill of Quantities or Contract Documents.

419.12.1.3 Except otherwise specified herein or elsewhere in the Contract Documents, no measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bills of Quantities. The cost thereof shall be deemed to have been included in the quoted unit rate of the respective items of the Bills of Quantities.



419.12.1.3.1 Preparatory works, including preparatory materials, scraping, scratching, sand blasting, cleaning, priming, protection of finished works etc.

419.12.2 Measurement

Measurement of works against respective item(s) given in the Bill of Quantities, acceptably completed in-conformance with the specifications under this Section, shall be made to the neat lines shown on the drawings and on the basis of No. of Units given in the Bill of Quantities.

419.12.3 Payment

Payment of acceptably completed works against respective item(s) given in the Bill of Quantities, as measured above, shall be made on the basis of Unit Rate quoted in the Bill of Quantities and shall constitute full compensation for all incidentals / associated works specified in this Section relevant to the item(s).

Pay Item No	Description	Unit of Measurement
SP-419	Painting	SM



420.1 DESCRIPTION

The work covered by this section of the special provision consist of furnishing all plant, labor, equipment, appliances and materials and of performing all operation in connection with construction of Steel Railing of Reinforced Concrete, Steel Pipes or Steel angles etc. over bridges, structures or on New Jersey Barriers, in strict accordance with these specifications, drawings and as directed by the Engineer.

420.2 MATERIAL REQUIREMENTS

420.2.1 Concrete

Quality requirements of all materials for concrete class A1 shall be in accordance with Item 401.

420.2.3 Reinforcing Steel

Quality of steel reinforcement shall be in accordance with the material requirements of Item 404.

420.2.4 Zinc Coated Steel Pipe (G.I. Pipes)

Zinc coated steel pipe (G.I. Pipes) shall be galvanized and threaded and shall conform to ASTM A53 Grade B.

420.2.5 Fitting and Specials for Zinc Coated Steel Pipes (G.I. Pipes)

Fittings and specials for zinc coated steel pipe (G.I. Pipes) shall be galvanized and threaded and shall conform to the applicable requirements of relevant ASTM Specifications.

420.2.6 M.S. Pipe and Square Bars

M.S. pipe / steel tube shall conform to ASTM A501 or ASTM A53 Grade B, square bars shall conform to the requirements of ASTM A36 and MS Sheet shall conform to ASTM A569 and as approved / directed by the Engineer.

420.2.7 Nuts and Bolts

Nuts and bolts shall conform to ASTM A307 Grade A and washers shall conform to Federal Specifications FA-W-92, Type A, Grade 1 and as approved/directed by the Engineer.

420.2.8 Steel Supports for Pipe Railing

The steel supports for pipe railing shall be constructed from MS Sheets properly cut to shape as shown on the drawings. The whole assembly



shall be of welded construction and shall be galvanized or painted as per Specifications.

420.3 WELDING

All welding shown on the drawing shall be of size and shape as shown on the drawings and shall be carried out in accordance with the clause 413.2.7 "welding" of these Specifications.

420.4 PAINTING

Painting of steel supports or pipe railing, if shown on the drawing or as directed by the Engineer, shall be carried out in accordance with the clause 413.2.10 "Painting" of these Specifications.

420.5 GALVANIZING

Galvanizing the steel supports and pipes railing (if not pre galvanized) shall be in accordance with the clause 413.2.8 "Galvanizing" of these Specifications.

420.6 CONSTRUCTION REQUIREMENTS

Steel pipe railing shall be installed in the manner and at locations shown on the Drawings. Fixed and removable railings and safety chains shall be furnished and installed in the locations indicated on the Drawings. The steel supports shall be constructed from MS Sheets according to shape and dimensions as shown on the Drawing. All shop and field connections shall be welded unless otherwise indicated on the Drawings. All welds shall be ground smooth. All railings and their supports shall be galvanized after fabrication, if pre galvanized pipes are not used. Galvanized coatings damaged in the field shall be repaired or replaced as directed by the Engineer. Railings shall be carefully adjusted prior to fixing in place to ensure proper matching at abutting joints and correct alignment and camber throughout their length.

420.7 MEASUREMENT AND PAYMENT

Measurement and payment for Steel Railing shall be made in accordance with the provisions given hereafter.

420.7.1 Measurement

Measurement shall be made for the number of linear meter of Steel Railing actually constructed in place and accepted in strict accordance with this Section of Specification and as shown on the drawings or as directed by the Engineer.



420.7.2 Payment

Payment shall be made for the number of linear meter of Steel Railing as provided above at the contract unit price per linear meter to furnish, construct and shaping the Steel Railing and shall constitute full compensation for all work related to the item.

PAY ITEM NO.	DESCRIPTION	UNIT OF MEASUREME NT
SP-420	Steel Hand Railing	LM



421.1 DESCRIPTION

The work covered by this section of the special provision consist of providing & fixing of MS grating furnishing all plant, labor, equipment, appliances and materials and of performing all operation in strict accordance with these specifications, drawings and as directed by the Engineer.

421.2 MATERIAL REQUIREMENTS

M.S. ANGLE IRON & SQUARE BARS

M.S. Angle Iron shall conform to ASTM A36, square bars shall conform to the requirements of ASTM A36 and MS Sheet shall conform to ASTM A569 and as approved / directed by the Engineer.

421.3 WELDING

All welding shown on the drawing shall be of size and shape as shown on the drawings and shall be carried out in accordance with the clause 413.2.7 “welding” of these Specifications.

421.4 PAINTING

Painting of steel supports or pipe railing, if shown on the drawing or as directed by the Engineer, shall be carried out in accordance with the clause SP-419 “Painting” of these Specifications.

421.5 CONSTRUCTION REQUIREMENTS

Steel pipe railing shall be installed in the manner and at locations shown on the Drawings. Fixed and removable railings and safety chains shall be furnished and installed in the locations indicated on the Drawings. The steel supports shall be constructed from MS Sheets according to shape and dimensions as shown on the Drawing. All shop and field connections shall be welded unless otherwise indicated on the Drawings. All welds shall be ground smooth. All railings and their supports shall be galvanized after fabrication, if pre galvanized pipes are not used. Galvanized coatings damaged in the field shall be repaired or replaced as directed by the Engineer. Railings shall be carefully adjusted prior to fixing in place to ensure proper matching at abutting joints and correct alignment and camber throughout their length.



421.6 MEASUREMENT AND PAYMENT

Measurement and payment for Steel grating shall be made in accordance with the provisions given hereafter.

421.7.1 Measurement

Measurement shall be made for each number fixed in place and accepted in strict accordance with this Section of Specification and as shown on the drawings or as directed by the Engineer.

421.7.2 Payment

Payment shall be made for each unit in Nos.

Item No.	Description	Unit of Measurement
SP-421	Providing and fixing, MS grating (1' x 4") using angle iron frame (L 1-1/2" X 1-1/2" X 3/16") fitted with 1/2" sq. bar welded with frame at 2" c/c complete in all respects.	Each



SP-615a&b GANTRY SIGNS

615.1 GENERAL

The work shall consist of supply, fabrication and installation of gantry signs at locations as shown on drawings or as directed by the Engineer as per the site requirement, complete in all respect. Gantry signs shall be required to be installed to provide the information about the important places and restriction enforced for type of passing vehicles.

The gantry signs shall be manufactured and installed in accordance with the details shown in the gantry sign's drawings and as directed and approved by the Engineer's representative. The sign panel shall be designed suiting the situation and approved by the Engineer's representative before its manufacture.

615.2 Gantry Sign Structure

The contractor shall be responsible to submit the complete methodology and shop drawings prior to the start of any activity and get approved from the Engineer representative. All work in respect of the furnishing, construction of foundation and erection and finishing of gantry sign structure shall conform to the drawings and to the relevant requirements of General Specifications section 401 "Concrete", section 404 "Steel Reinforcement", section 413 "Steel Structures and section 607 "traffic signs and safety devices" with amendments made in SP-504.

615.3 MEASUREMENT AND PAYMENT

The item shall be paid for as under, which price and payment shall be full compensation for all the costs necessary for the proper manufacture, installation and completion of work prescribed in the item/drawing:

Payment Item No.	Description	Unit of Measurement
SP-615a	Gantry Sign Type-I as shown on drawing	Each
SP-615b	Gantry Sign Type-II as shown on drawing	Each



SP-616 NEW JERSEY BARRIERS

616.1 DESCRIPTION

This work shall consist of construction of New Jersey Barrier in accordance with these specifications and the specifications for other work items involved, and in conformity with the lines, grades, and dimensions shown on the drawings or as ordered by the Engineer.

616.2 MATERIAL REQUIREMENTS

616.2.1 Formwork

Formwork shall be in accordance with item 403.

616.2.2 Concrete

Types of concrete shown on the drawings or as directed by the Engineer shall be in accordance with item 401.

616.2.3 Steel

Steel reinforcement shall be in accordance with item 404.

616.3 CONSTRUCTION REQUIREMENTS

616.3.1 Excavation

Excavation within the design line and grade, where necessary shall be carried out up to the designated levels.

616.3.2 Concrete

The concrete shall be as specified on the drawings and shall be according to all lines, grades and dimensions mentioned on drawings. The concrete specifications shall confirm to item 401 & 405 and /or as directed by the Engineer.

616.4 MEASUREMENT AND PAYMENT

616.4.1 Measurement

The unit of measurement for New Jersey Barrier shall be linear meter when laid and finished to the required grade and line and accepted by the Engineer. No extra payment shall be made for excavation.

616.4.2 Payment

The amount of completed and accepted work as measured shall be paid for at the unit price specified in the bill of quantities. This price shall be full compensation for excavation, formwork, materials, labor, equipment and other incidentals to complete the work in all respects.

Pay Item No	Description	Unit of Measurement
SP-616	RCC New Jersey Barrier (In-Situ) Single Face 1010 mm high (Incl. Reinforcement)	M



617.1 DESCRIPTION

The work consists of supplying, installing, and commissioning of all material and services of the complete conduits and pipes as specified herein, shown on the Tender Drawings and/or as directed by the Engineer.

The Contractor shall get the prior approval of the layout from the Engineer at Site for exact route, location and position of the conduits and pipes.

617.2 GENERAL

The extent of work shown on the Drawings does not indicate the exact position of conduits and pipes. The Contractor shall ensure exact location and route of conduit and pipes in coordination with other services on drawings, as per site requirements and get the approval of Engineer prior to execution of the work.

617.3 APPLICABLE STANDARD/CODES

Latest editions of the following standards/codes shall be applicable for the materials in scope of this Section:

- BS 6099 - PVC conduits and accessories
- BS 3595 - PVC pipes & accessories
- BS 4346 - Cement Solvent for jointing

617.4 MATERIAL

617.4.1 PVC Conduits and Accessories

The heavy gauge PVC conduits and accessories conforming to BS6099 shall be generally used. The PVC conduits and accessories of light gauge may be used on the project with the concurrence of the Engineer.

The PVC bends, sockets, elbows, couplings etc. shall conform to the same specifications as for the conduits. The PVC bends shall have enlarged ends to receive conduit without any reduction in the internal diameter at joint. Manufactured smooth bends shall be used where conduit changes direction. Bending of conduits by heating or otherwise will not be allowed in any situation. The use of sharp 90-degree bends and tees will not be allowed.

617.4.2 PVC Pipe and Accessories

The PVC pipe shall be rigid. All pipes shall be minimum Class D (Working pressure - 12 bar), unless otherwise stated on drawings. The buried PVC pipe should be able to withstand the external load acting upon it by continuous



movement of heavy duty vehicles such as trucks, cranes, forklift, etc. Where pipe changes direction, manufactured smooth bends shall be used. Bending of pipes by heating or otherwise will be allowed in special cases only. Bending of pipes by heating shall be carried out by first filling the pipe with sand inside and then immediately removing the sand. The use of sharp 90-degree bends and tees will not be allowed. The bends shall conform to same specifications as given for PVC conduits. For joining of pipe all precautions and procedures recommended by manufacturer shall be followed.

617.5 INSTALLATION

617.5.1 PVC Pipe

Rigid PVC pipes shall be installed under roads and paved areas, at crossing with other services as shown on the Drawings and/or as directed by the Engineer. The depth of the pipe shall vary according to the conditions at site, and approval of Engineer shall be obtained prior to installation. In general, the pipes shall be installed underground at the following depths measured from the top of the pipe:

- a) Under roads and paved surface 800 mm below the finished surface
- b) When crossing other services 250-mm vertical clearance
for the crossing length 500 mm horizontal clearance
with CC protective cover

The trench of required dimensions shall be excavated and the bottom of trench cleaned and leveled. A four-inch thick bed of fine sand shall be provided over which the PVC pipes installed after proper alignment. Where two or more pipes are installed in the same trench the clearance between pipes shall not be less than two inches. After laying of pipe the trench shall be backfilled with clean-screened earth in layer of four inches. Each layer shall be properly compacted. All joints shall be sealed adequately to prevent entry of foreign elements.

The installation of pipes shall be completed in all respects including its fixing at terminations, before cabling work is started. All sharp edges and burrs shall be removed by using reamer or any approved device. The pipe shall be thoroughly cleaned of dirt and dust from inside. The pipes shall be installed in proper co-ordination with other works.

617.6 MEASUREMENT AND PAYMENT

Measurement

Measurement shall be made for the number of running meters of pipes acceptably supplied and installed by the Contractor.



Payment

Payment shall be made for the total numbers of meters measured, as provided above, at the Contract unit price. The payment shall constitute full compensation for supplying, installing and completion of the laying of the PVC pipes including jointing materials and accessories and all incidentals for completion of the work.

Pay Item No	Description	Unit of Measurement
SP-617	PVC Pipe 150mm dia	M



618.1 DESCRIPTION

The work shall consist of precast concrete paving blocks intended for the construction of low speed roads, parking areas, lay byes, industrial and other paved surfaces subjected to all categories of static and vehicular loading and pedestrian traffic.

Paving blocks covered by these Specifications are designed to form a structural element and the surfacing of pavements, having the block to block joints filled, so as to develop frictional interlock and placed in conformity with the lines, grades, thicknesses and typical cross-section shown on the drawings or as directed by the Engineer.

618.2 MATERIAL REQUIREMENT

For execution of this item provisions made in BS 6717 shall be applicable. Detailed requirement of materials and construction shall be as under:

618.2.1 BINDERS AND BINDER CONSTITUENTS

Paving blocks shall be made using one or more of the following binders or binder constituents complying with the requirements of the relevant standards:

Ordinary Portland Cement	BS 12
Portland Blast furnace Cement	BS 146: Part 2
Portland Pulverized Fuel ash Cement	BS 6588
Pulverized fuel ash	BS 3892: Part 1
Ground granulated Blastfurnace slag	BS 6699

Where pulverized fuel ash is used, the proportions and properties of the combination with Portland Cement shall comply with BS 6588.

Where ground granulated blast furnace slag is used, the proportions and properties of the combination with Portland Cement shall comply with BS 146 Part 2.

618.2.2 AGGREGATES

Paving blocks shall be made using one or more of the following aggregates complying with the relevant standards:

Natural Aggregates (Crushed or Uncrushed)	BS 882 : 1983 (except grading requirements in clause 5)
Air Cooled blast furnace slag	BS 1047 : 1083 (except grading requirements in 4.8)
Pulverized fuel ash	BS 3892 : Part-1 or Part-2
Ground granulated blast furnace slag	BS 6699



618.2.3 ACID SOLUBLE MATERIAL (FINE AGGREGATE)

When tested as described in BS 812 : Part 119, the fine aggregate (material passing a 5 mm sieve complying with BS 410) shall contain not more than 25% by mass of acid soluble material either in the fraction retained on, or in the fraction passing, a 600 μ m sieve.

618.2.4 WATER

The water shall be of drinking quality or in accordance with the recommendations of appendix A of BS 3148 : 1980.

618.2.5 ADMIXTURES AND PIGMENTS

Proprietary accelerating, retarding and water reducing agents shall comply with BS 5075 : Part 1.

Pigments shall comply with BS 1014.

Calcium chloride shall comply with BS 3587

618.2.6 FINISHES

The finish should be agreed between the manufacturer and the Engineer. Concrete described as "natural colour" shall contain no pigment.

In composite paving blocks the surface layer shall be formed as an integral part of the block and shall be not less than 5 mm thick.

618.2.7 BINDER CONTENT

The cement content of the compacted concrete shall be not less than 380 kg/m³. For equivalent durability, paving blocks made with binder constituents other than ordinary Portland cement shall have a higher binder content than paving blocks made in a similar way using only Portland Cement. The Engineer will decide the additional binder content. The compressive strength test will be the only guide to the amount of additional binder needed.

618.3 SIZES AND TOLERANCES

618.3.1 SIZES

Paving blocks shall have a work size thickness of not less than 60 mm. Type- R blocks shall be rectangular with a work size length of 200 mm and a work size width of 100 mm. Type-S blocks shall be of any shape fitting within a 295 mm square coordinating space and shall have a work size width not less than 80 mm.

The preferred work size thicknesses are 60 mm, 65 mm, 80 mm & 100 mm.

A chamfer around the wearing surface with a work size not exceeding 7 mm in width or depth shall be permitted.

All arises shall be of uniform shape.



618.3.2 TOLERANCES

The maximum dimensional deviations from the stated work sizes for paving blocks shall be as follows:

Length	\pm	2 mm
Width	\pm	2 mm
Thicknes	\pm	2 mm

Where a paving block includes profiled sides, the profile shall not deviate from the manufacturer's specification by more than 2 mm.

618.4 STRENGTH REQUIREMENTS

618.4.1 COMPRESSIVE STRENGTH

The compressive strength of paving blocks shall be not less than 49 N/mm² (7000 PSI).

618.4.2 SAMPLING & TESTING

The following sampling procedure shall be used for the compressive strength test.

- a. Before laying paving blocks, divide each designated section, comprising not more than 5000 blocks, in a consignment into eight approximately equal groups, clearly mark all samples at the time of sampling in such a way that the designated section or part thereof and the consignment represented by the sample are clearly defined. Take two (2) blocks from each group.
- b. Dispatch the sample to the test laboratory, taking precautions to avoid damage to the paving blocks in transit. Each sample shall be accompanied by a certificate from the person responsible for taking the sample, stating that sampling was carried out in accordance with this Part of BS 6717.
- c. Protect the paving blocks from damage and contamination until they have been tested. Carry out any tests as soon as possible after the sample has been taken.

618.5 MARKING

The following particulars relating to paving blocks made in accordance with this standard shall be indicated clearly on the delivery note invoice, manufacturer's or supplier's certificate or brochure supplied with the consignment of blocks:

- a. The name, trade mark or other means of identification of the manufacturer.
- b. The number and date of this British Standard, i.e. BS 6717 Part 1 1986 or latest revision.



618.6 CONSTRUCTION REQUIREMENTS

618.6.1 LAYING THE CONCRETE BLOCKS

The total area to be covered with paving blocks shall be prepared by:

Compaction of Subgrade

Laying of sub base in a thickness specified

Laying of crushed aggregate base or lean concrete in thickness as per typical section

618.6.2 TOLERANCES

Tolerance of these layers shall be as per applicable requirement of each item of this specifications.

Payment for each of the above item shall be made under the relative item of work.

The total area will thereby be divide with nylon strings into sectors of not more than 1.5 square meters or 10 sft. This shall be done to control the alignment of paving blocks and to avoid multiplication of deviation in sizes of paving blocks.

618.7 MEAUREMENT AND PAYMENT

618.7.1 MEASUREMENT

The area to be measured shall be bound by lines shown on the drawings or as directed by the Engineer. Unit of measurement shall be square meter measured in horizontal plane.

618.7.2 PAYMENT

The quality determined as provided above shall be paid for the unit price of contract for each square meter of paving block installed including sand cushion and sand filling in joints and all other work related for installing paving blocks. Cost shall include all labour, materials and equipment for proper completion of work.

Pay Item No	Description	Unit of Measurement
SP-618	Providing and laying Tuff pavers, having 7000 PSI, crushing strength of approved manufacturer, over 2" to 3" sand cushion i/c grouting with sand in joints i/c finishing to require slope complete in all respect. b). 60mm	SM



701.1 DESCRIPTION

The Contractor shall provide and maintain survey equipment for the sole use of the Engineer. All surveying equipment shall be new and shall be maintained throughout the Contract period and replaced by the Contractor free of charge in case of damage or loss. The survey equipment shall be supplied to the Engineer within thirty (30) calendar days from the Engineer's Order to Commence the Works.

Upon completion of the Contract, the surveying instruments and equipment shall become the property of the Employer and shall be handed over completely, and in a state of good, condition and working order taking into account fair wear and tear.

The Contractor shall provide adequate number of helpers, along with the equipment, to the Engineer/Engineer's Representative to assist in carrying out the field works.

701.2 EXTENT OF PROVISION AND GENERAL REQUIREMENT

The Contractor shall provide and maintain at his own cost at least the following surveying equipment and any other surveying equipment deemed essential for the Work by the Engineer's Representative for the sole use of the Engineer's Representative:

Sr. No	Description	Quantity
1	Electronic Total Station 1" reading, 6" Accuracy, memory 10,000 points or more, Builtin SD Card Slot & USB Port, programs topographic survey, setting out, curve Guide Light, Keyboard, Automatic Dual Axis Compensator working range $\pm 6'$ distance range reflector less 400 meter with single prism 5000 meter, with Triple Prism 6000 meters, one Balley & Quick Charger in Standard Accessories (Made in Japan or Equivalent).	1 Nos.
2	Software for Data Downloading.	1 No.
3	Single Prism Target Set includes: Prism, range pole graduated 2.6m., tilting mount with Coaxial Target Plate.	4 Nos.
4	Automatic Level, magnification 32X	2 Nos.
5	Levelling Staves with graduations in metric units	12 Nos.
6	Steel measuring tapes 30 m long	4 Nos.
7	Lockable Pocket tapes 5 m.	4 Nos.
8	TRIPOD (Aluminum)	5 Nos.



9	TRIPOD for Prism Pole	4 Nos.
10	Club hammers 2 kg.	4 Nos.
11	Sledge hammers 4 kg.	4 Nos.
12	Traffic Cones	40 Nos.
13	Survey Umbrellas	6 Nos.
14	Aluminum Straight Edges, 4 m long	2 Nos.
15	Aluminum Straight Edges, 5 m long	2 Nos.
16	Spirit Levels, 30cm long	4 Nos.

- *All miscellaneous tools, equipment and materials required in surveying in numbers as determined by the Engineer's Representative.*

All new surveying equipment shall be provided and maintained throughout the Contract period. In case of damage or loss those shall be replaced by the Contractor at his own cost.

The Contractor shall make available two (02) qualified surveyors and transport vehicle for checking and incorporation as and when required by the Engineer's Representative.

The survey equipment shall be placed at the disposal of the Engineer's Representative during the Contract period and shall be returned to the Employer on completion of the Contract, complete and in a good state, taking into account fair wear and tear.

The Contractor shall provide adequate supplies of expendable materials i.e. level books, pencils, erasers inks, drawing papers, pegs, nails, flags, brushes and paints etc. as required by the Engineer's Representative.

701.3 PAYMENT

The cost of supplying the equipment shall be paid as re-imbusement against provisional sum substantiated by vouchers from the owner plus twelve (12) percent surcharge to the contractor for administrative and overhead expenses including income tax (7.5%) related to the purchase and delivery of said items.

For running and maintenance, supporting staff, transport, stationery, utilities etc. shall be paid under maintenance of Surveyor Instrument.



Payment shall constitute full compensation for all costs of provision and maintenance of equipment, provision of vehicle, furnishing survey teams, supplies of expendable materials, necessary labor/helpers and all other incidental item(s) for the proper completion of the Work as stated herein above and as directed by the Engineer's Representative:

Item No.	Description	Unit of Measurement
SP-701a	Provide Surveying and Allied Instruments.	P.S.
SP-701b	Maintain Survey Instruments, Including 2no. Helpers..	Month



SP 702 PROVIDE EQUIP & FURNISH ENGINEER'S OFFICE & ACCOMODATION

702.1 General

The contractor shall provide a site office on rental basis against provisional sum provided in the Bill of Quantities. The site office includes the following:

- i) Office accommodation
- ii) Office furnishing and equipment
- iii) Office running and maintenance
- iv) Office supporting staff

702.2 Engineer's Representative Office / Accommodation

The office accommodation as approved and accepted by the Engineer shall be provided on rental basis. The overall size of the Engineer office shall be approximately 1000 Square. meters and residence accommodation of about 2,000 Square. meters having all kind of facilities.

702.3 Furnishing & Equipment

The furniture and equipment as approved and accepted by the Engineer shall be provided by the Contractor on the instructions of the Engineer or Representative of Engineer as per the requirement.

702.4 Running and Maintenance

702.4.1 The contractor shall be responsible for the running and maintenance of office accommodation, residence accommodation, furnishing and equipment etc. bills for all services/utilities to be paid by the contractor.

702.4.2 Office and Drawing Stationery and necessary equipment shall be provided by the contractor on monthly requirement basis as per the requirement or as directed by the Engineer.

702.5 Supporting Staff

The contractor shall provide to the Engineer following supporting staff.

- i) Naib Qasid Two
- ii) Chowkidar Two
- iii) Cook Two and helper 02
- iv) Sweeper Two
- v) Guards Two

The appointment of the supporting staff shall be subject to the approval of the Engineer and once assigned shall not be transferred or laid off without prior approval of the Engineer.

In case of power failure and non-availability of power, electric power through generators shall also be provided by the contractor. All rooms shall be provided with standard office lighting of the flours cent type. All



rooms shall have doors with locks and keys and supplied Air-conditioning and heating system as per the approval of the Engineer.

The water supply shall be maintained through water supply system of the town or locality boring/installing well with pump or by an elevated or pressure storage tank with a capacity of 2500 gallons.

A telephone shall be installed in Engineer's Office or cell phone may also be provided to facilitate the Engineer. Engineer office will be equipped with air-conditioning unit as per requirement.

702.6 Measurement and Payment

For the hiring of accommodation for site office if approved & allowed by the Engineer, the cost of rent and supplying office furniture and Equipment shall be paid as re-imburement against provisional sum substantiated by vouchers from the owner plus twelve (12) percent surcharge to the contractor for administrative and overhead expenses including income tax (7.5%) related to the purchase and delivery of said items.

For running and maintenance, office supporting staff, drawings, stationery, utilities bills etc. shall be paid under maintain of Engineer's office.

If the contractor does not provide necessary facility, Engineer shall hire the accommodation and arrange necessary supplies of furniture and equipment and employ staff etc. as specified and maintain the office. Expenditures shall be recovered from the IPC's / running bills of the contractor by adding hundred (100) percent overheads.

Pay Item No.	Description	Unit of Measurement
SP-702 a	Provide the Employer's and Engineer's Representative's Office and Residence	Provisional Sum
SP-702 b	Furnish and Equip. the Employer's & Engineer's Representative Office and Residence	Provisional Sum
SP-702 c	Maintain Employer's and Engineer's Representative Office and Residence	Month



SP 703 PROVIDE, EQUIP AND MAINTAIN LABORATORY FOR THE PROJECT

703.1 Description

The work under this special provision shall be providing of three nos material testing laboratories on rental basis having minimum 500 Sq.m covered area of each and shall be fully equipped with all necessary furnishing & equipment, utilities, installations and others as directed by the Engineer. Locations of material testing laboratories shall be as per approval / decision of the Engineer.

703.2 General Requirements

The furnishing of equipment shall ensure conducting all tests related to construction as per the list provided by the Engineer. In case if any test required for testing of material cannot be performed in the project laboratory, the Engineer may authorize such test to be carried out at the cost of contractor, at any other laboratory. The Contractor shall provide at no cost to the Engineer, technicians, helpers and vehicles deemed necessary by the Engineer, to assist in the operation of the laboratories as required by the Contractor's proposed program of work. Technicians and helpers once assigned to the laboratories may be removed by the Contractor only with the approval of the Engineer and salaries shall be paid by the contractor. The equipment shall be procured within 15 days on the instructions of the Engineer.

The contractor shall maintain the laboratory equipment, apparatus and supplies necessary to permit execution of all standard test required by the specifications. Lists of specific laboratory equipment shall be provided as per the requirement and recommendation to purchase from recognized manufacturers. The Contractor shall submit to the Engineer for his approval at the earliest. The list shall include the manufacturer's name and descriptive literature. Lab Equipment, fixtures and furniture shall remain the property of the Employer after completion of the project.

703.3 Facility of the Material Testing

Material testing equipment as described above shall be provided within minimum period. In case of delay in providing such facility, as an interim arrangement, temporary facilities of testing material shall be provided as agreed by the Engineer. Contractor may be paid for maintenance of temporary laboratory, provided such facilities are acceptable to the Engineer. Contractor shall also be responsible for extra expenses of the Engineer for conduction of test in temporary arrangement.

703.3.1 Supporting Staff

The contractor shall provide to the Engineer below mentioned supporting staff:

- | | | |
|------|------------|-----|
| i) | Naib Qasid | One |
| ii) | Chowkidar | One |
| iii) | Cook | One |
| iv) | Sweeper | One |



The appointment of the supporting staff shall be subject to the approval of the Engineer and once assigned shall not be transferred or laid off without the Engineer approval. Salaries shall be paid by the contractor.

703.4 Running and Maintenance

703.4.1 The contractor shall be responsible for the running and maintenance of Laboratory, furnishing and equipment etc. bills for all services/utilities to be paid by the contractor.

703.4.2 Office and Drawing Stationery and necessary equipment & material shall be provided by the contractor on monthly requirement basis as directed by the Engineer.

703.5 MEASUREMENT AND PAYMENT

703.5.1 Measurement

Work under this item shall be measured in two portions.

- i) Hired the building for Material Testing Laboratory and purchase of laboratory equipment shall be paid as reimbursement against provisional sum substantiated by vouchers from the owner plus twelve (12) percent surcharge to the contractor for administrative, overhead expenses including income tax (7.5%) related to the purchase and delivery of said items.
- ii) For running / maintenance and office supporting staff, drawing stationery, Lab. Material/equipment (minor), utilities bills , helpers (06 nos.) etc. shall be paid under maintain base Laboratory. Maintain Laboratory, to be measured for the duration of the contract and paid as per the rate/month.

703.6 Payment

The quantities under this item of work shall be paid at the contract price indicated in the Bill of Quantities which price and payment shall constitute full compensation for all costs of furnishing labor, materials, equipment and incidentals for the proper completion of the work indicated in these specifications and specified on the drawings and Special Provisions (Specification).

Pay Item No.	Description	Unit of Measurement
SP- 703 a	Provide Material Testing Project Laboratory	Provisional Sum
SP- 703 b	Equip and Furnish Material Testing Project Laboratory	Provisional Sum
SP- 703 c	Maintain Material Testing Project Laboratory 01 Nos including 02 No Helpers	Month



SP-705 DETOUR ROADS AND MAINTENANCE OF TRAFFIC

705.1 General

The Contractor shall conduct his operations so as to offer the least possible obstruction and inconvenience to the public in accordance with item 705 and 706 of General Specifications and Special Provisions and he shall have under construction no greater length or amount of Work that he can execute properly with due regard to the right of the public and movement of vehicles.

Unless otherwise directed by the Engineer, all public traffic shall be permitted to pass through the work zone with as little inconvenience as possible.

Two-way traffic flow must be provided at all times whether within the existing road or by use of detour roads or by a combination of both in coordination with the National Highway and Motorway Police, free of cost to the Employer.

The temporary bridge, culvert or road if required for detour shall be properly designed, built and maintained for the load it will bear. The Contractor shall prepare and submit the drawings of such temporary works to the Engineer for approval. Approval of the Contractor's drawings shall not be considered as relieving him of any responsibility for safe designing and constructing the temporary bridge, culvert or road.

705.2 Maintenance of Existing Traffic

The Contractor shall be responsible for the safety and convenience of the traffic in the project area and around the operations during construction in coordinate with the National Highway and Motorway Police. Traffic control devices shall be provided and maintained in good working condition throughout the period as instructed by the Engineer.

Roadway excavation, construction of embankments and widening of road shall be conducted in such a manner as to provide a reasonably smooth and even surface satisfactory for use by the traffic at all times. During rainy seasons, special surface treatment such as bituminous single surface treatment or other method approved by the Engineer shall be executed however it shall not be paid to contractor. The riding surface shall be maintained smooth and dense by regular grading, sprinkling of water and rolling operations.

The Public shall not be expected to run within the limits of active construction operations and the Contractor shall so program and carry out his work as to allow an adequate width of roadway unobstructed for the safe passage for the Public.



The Contractor shall prepare and submit to the Engineer a Comprehensive Traffic Management and Maintenance Plan for its approval before commencement of construction works at site. The contractor shall implement the said Plan to the satisfaction of the Engineer, otherwise the Engineer may hold certification of the interim payments.

The Contractor shall so schedule and carry out his work that pedestrian and vehicle access to adjoining premises along the road shall be maintained at all times, except with the written agreement of the owner/occupier of the premises.

705.3 Measurement and Payment

The costs of the Work involved in detour and maintenance of traffic as specified herein shall not be measured for direct payment and its cost shall be deemed to have included in the other item rates of Works.

705.4 Deduction

In case the Contractor fails to maintain the free flow of traffic with a reasonably smooth and dust free riding surface, to the satisfaction of the Engineer, the Engineer may so certify in writing to the Employer and the Employer may thereupon Employ and other persons to carry out the same and recover all expenses consequent thereon and incidental thereto from the Contractor without avoiding the Contract or releasing the Contractor from any of his obligations or liabilities under the Contract or affecting the rights and power conferred on the Employer or the Engineer by the Contract.



SP-706 TRAFFIC CONTROL DEVICES

706.1 General

The Contractor shall provide for the passage of traffic along the Road at all times in and around the construction sites all in accordance with item 706 of General Specifications and these special provisions. During critical activities, the Contractor may with the approval of the Engineer, provide for one way movement for selected and short sections of the highway.

For the control of traffic during construction, the Contractor shall furnish install and maintain such signs, delineators barricades, flashers and flagmen as are necessary for proper execution as per Comprehensive Traffic Management and Maintenance Plan submitted by the contractor and approved by the Engineer. The plan shall contain the diagram or sketch outlining in detail the area or areas affected and the location, details of detours and diversions, type and number of signs boards, delineators, barricades, flashers and flagmen he proposes to use for round the clock management of traffic at the site.

706.2 Construction Signs

Nominal size 1.2m x 1.2m diamond or square shaped of steel sheet with black letters painted on a yellow background. Letter size shall be minimum 12 cm in height. Signs shall be placed at 50 m and 100 m intervals commencing 500 m from the work site. The signs shall be placed approximately 2m right and 1.5m above the edge of pavement facing oncoming traffic. Typical sign workings to be used are: DETOUR AHEAD, FLAGMEN AHEAD, ONE LANE ROAD AHEAD, ROAD CONSTRUCTION AHEAD, ROAD CLOSED AHEAD, MEN WORKING, SLOW DOWN AND STOP etc.

In addition, other warning or regulatory signs shall be developed and located as the Engineer may direct to facilitate the flow of traffic.

706.3 Barricades

Steel sheet cross bars, nominally 25 by 2 cms and 1.2m wide shall be painted in 15-45 cms diagonal black and white alternating stripes and mounted on 15 cms posts, 1.2 m high, fastened to a suitable base platform. If necessary for stability the base shall be weighted with sand bags rocks or other materials. Barricades shall be located on the roadway no more than 100m from each end of the restriction.

706.4 Delineators

Delineators shall be reflective red or yellow plastic cones or plastic pipe with a minimum height of 45 cms and mounted on a suitable base. Delineators shall be spaced at 20 m intervals alongside the traffic side of the restricted work area.



706-5 Warning Lights

Warning lights shall be electric flashers with a bidirectional two lens head assembly. The lenses shall be minimum 15 cms in diameter. The intensity of the warning lights shall be at least 4 candle power and the flash rate shall be between 50-75 flashes per minutes. Normally warning lights shall be placed on all barricades and the adjacent construction sign. The Engineer may direct the placement of any additional warning lights at any other location at the site.

706.6 Flagmen

Flagmen shall be provided with a vest of reflective red material and construction type hard hat and have two hand signs at all times. The hand signs shall be of the paddle-type 30 cms in diameter, one painted STOP/GO and the other painted SLOW. Flagmen shall be posted at the beginning and end of the restricted section and at intervals within the zone as required. The number of Flagmen shall be deployed as instructed by the Engineer but not less than 25.

The Contractor shall install signs, lights, delineators barricades and furnish flagmen as specified above or as directed by the Engineer and shall maintain all such devices in good condition. Should the Contractor appear to be neglectful or negligent in furnishing warning and protective measures as stated herein, the Engineer may direct attention to the existence of a hazard and necessary warning measures and devices shall be furnished and/or installed by the Contractor without hesitation.

The Contractor shall not be relieved from his responsibility for public safety throughout the Contract duration.

706.7 Measurement and Payment

The Cost of furnishing, installing and maintaining the necessary warning and protective measures including the furnishing of competent flagmen shall not be measured and paid for separately and shall be deemed to be included in the other items of work entered in the Bill of Quantities.



708.1 General

The transport for the Employer's / Engineer's Representative and site staff is to be provided under this Contract for which provisional sum and rate item has been provided in the B.O.Q. Contractor shall procure these vehicles under the instruction of the Engineer.

Procurement of Vehicles

The contractor shall procure the vehicles from the local market, get these registered in the name of the Employer and hand over to the Employer's and Engineer's Representative.

Details /Type of vehicles are as under:

SP-708a : Employer's Representative's Transport
Two (02) Nos. vehicles for the Engineer's representatives

- | | | |
|------|----------------------------------|---------|
| (i) | 4x4 Double Cabin 2800cc with A/C | (1 No.) |
| (ii) | Car 1800cc with A/C | (1 No.) |

SP-708b : Engineer's Representative's Transport
Four (04) Nos. vehicles for the Engineer's representatives

- | | | |
|------|----------------------------------|-----------|
| (i) | 4x4 Double Cabin 2800cc with A/C | (02 Nos.) |
| (ii) | MPV 1000cc with A/C | (02 Nos.) |

The number of vehicles (6 nos.) covered under this provision shall be new/latest model at the time of delivery when instructions to procure these vehicles is given as per approval of the Engineer. The vehicles shall be handed over to Employer / Engineer's Representative. The Contractor shall be responsible for the cost of running & maintenance. These vehicles shall remain the property of the Employer and shall be handed over to the Employer after completion of the work in good working condition. The cost of vehicle shall be inclusive all like purchase, transportation, registration and other dues incurred in this regard. In case new vehicles are not purchased, same numbers of road worthy conditions vehicles shall be hired and its rent cost shall be paid through pay item SP-708a, rental cost shall be approved by the Employer.

In case of delay, failure or default on the part of the Contractor in providing the facilities under these provisions, the Engineer's Representative may arrange the same at the risk and cost of the Contractor or hired the vehicles such period.

708.2 Running & Maintenance

The Contractor shall be responsible for the running and maintenance of these vehicles which includes petrol, diesel, repair works, regular tuning,



replacement of tires, registration, comprehensive insurance, annual renewal, lubricants, servicing including providing drivers etc.

708.3 Method of Payment

On the instructions and determination by the Engineer, Contractor shall be paid for the Services under this Clause as follows:-

- i) For the procurement of vehicles Contractor shall provide the original supporting vouchers/receipts for his billing which shall be paid from the provisional sum with 12% extra cost as handling charges and income tax. In addition to that contractor shall also be paid applicable levies & other taxes but not the income tax (7.5 %) (If applicable).
- ii) For running and maintenance of above vehicles including salaries of drivers, the Contractor shall be paid on monthly basis.
- iii) On failure of the contractor to provide and of the services under this clause or even otherwise notwithstanding anything contained in any other clauses of the Contract Documents, the "Engineer" shall have the authority to nominate/sublet to any other contracting agency on recommendation of the Resident Engineer for the supply of services under this clause, the payment for which shall be made through this contract direct to the nominated agency out of Provisional Sum provided in the Contract or hire the good road worthy vehicles and recover the cost with 100% penalty charges from contractor's IPC's.

Item No.	Description	Unit of Measurement
SP-708a	Provide Employer's Representative's Transport	
	(i) 4x4 Double Cabin 2800cc with A/C (1 No.)	Each
	(ii) Car 1800cc With A/C (1 No.)	Each
SP-708b	Provide Engineer's Representative Transport	
	(i) 4x4 Double Cabin 2800cc with A/C (02 Nos.)	Each
	(ii) MPV 1000cc with A/C (02 Nos.)	Each
SP-708c	Running & Maintenance of Employer's & Engineer's Representative Transport	Vehicle-Month



SP-709

EMPLOYING TRAINEE ENGINEER'S WITH BOARDING, LODGING AND MESSING

The contractor will employ Trainee Engineers after the approval of the Employer, throughout the duration as per the contract and BOQ. Each Trainee Engineer will be given a monthly stipend Rs. 70,000 (minimum) by the contractor. The period of training of each trainee will be as per the contract. The Contractor will prepare a comprehensive training program and get it approved from NHA. It will be the contractor's responsibility for the provision of boarding & lodging of each Trainee Engineer or paid separately its cost.

Measurement and Payment

The number of Trainee Engineers shall be counted and paid to contractor as per the contract unit price which includes full compensation for all costs necessary like monthly stipend, boarding, lodging and transport facility.

Item No.	Description	Unit of Measurement
SP-709	Employing Trainee Engineer with boarding, lodging and messing with the approval of Member Planning NHA (04 Nos.)	Man-Month



SP-710

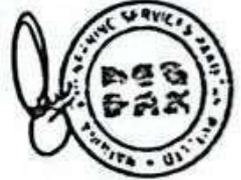
DEPLOYMENT OF QUANTITY SURVEYOR IN NHA (HQ) DESIGN SECTION

The contractor will employ 01 no Quantity Surveyor (DAE Civil) for NHA (HQ- Design Section) after approval of the Member (Planning), throughout the duration of project as per the contract BOQ. Quantity Surveyor will be given a monthly salary of Rs. 200,000 (minimum) by the contractor inclusive of all benefits. The period of hiring of Quantity Surveyor for NHA (HQ-Design Section) will be as per the contract.

Measurement and Payment

The contractor shall be paid under this item against hiring period for which Quantity Surveyor shall be deployed for NHA (HQ- Design Section) as per the contract unit price.

Item No.	Description	Unit of Measurement
SP-710	Deployment of Quantity Surveyor in Design Section at NHA HQ having minimum 10 years of experience with the approval of Member (Planning), NHA.	Month



ELECTRICAL WORKS

ELECTRICAL WORKS

1.1 DESCRIPTION

The work under this Contract consists of supplying, storage at site, installing, testing and commissioning of all materials and services comprising poles, lighting fixtures, lighting control panels, distribution transformers, cables, earthing, conduits and pipes etc., as specified herein, shown on the Drawings and given in the Bill of Quantities. Small items which are not expressly specified but which are necessary for completion of work shall be supplied by the Contractor without extra cost. The supply connection for lights etc. shall be obtained from the nearby WAPDA source. The work shall be complete in every respect for satisfactory operation as per specifications and standards give hereinafter.

The Contractor shall co-ordinate with the Engineer at site with respect to other services for exact location and position of all electrical equipments.

1.2 GENERAL

The location of the lighting fittings, poles, distribution boards, lighting control panels, distribution transformers and cables etc. are tentatively shown on the drawings. The Contractor shall ensure the exact position and location of poles and cable routes etc. in coordination with other services as per site requirement. The Contractor shall be responsible for proper light distribution on the road/underpass surface from the proposed luminaires and other equipment after installation and commissioning. He shall be fully responsible during maintenance period of the works.

The road/underpass lighting work shall be installed as per requirements of BS-5489 or other similar international standards. The Contractor shall also comply with the regulations of Pakistan Electricity Act and requirements of Water and Power Development Authority (WAPDA), wherever applicable.

The quality of equipment shall be of the best grade for each type, even though such quality may not be stated specifically in the specifications. All materials and products shall be new and manufactured by well known firms. Furthermore, these shall be sound and uniform in quality, size, shape, colour and texture and free from cracks, wrapage or other defects.

Component parts of each electrical system or piece of equipment shall be the latest standard product of a single manufacturer unless otherwise specified and provided sub-components, manufactured by different manufacturers are of specified standards design and dimensions and interchangeability is possible and shall normally have been satisfactory in service for at least two years.



The design criteria for road lighting are based on the following parameters;

Luminance (L) cd/m ²	1~1.5 cd/m ²
Overall Uniformity (U _o) (U _o = L min./L avg.)	0.4
Uniformity of Each lane (U _l) (U _l = L min./L max.)	0.5 – 0.7
Threshold increment not exceeding	≤ 10

Road surface characteristics as per IEC classification is type R2 with q_o = 0.07.

The contractor shall be responsible and confirm in writing that his selection of equipment will ensure on the road surfaces luminance level and uniformities equal or better than those defined in the lighting design criteria.

Within six (6) weeks after award of the contract, the contractor shall submit the technical details of the luminaries and other equipment and having obtained conditional approval thereof submit in duplicate, full detail of the calculated results for the level and uniformity of luminance and illumination on all road surface. These detail should be submitted in the format as described in the relevant IEC publication and after initial approval by the engineer.

1.3 APPLICABLE REGULATIONS AND STANDARDS/CODES

The latest edition of the following standards & codes shall be applicable for the materials within the scope of this work.

- IEC - International Electro-technical Commission
- IEEE - Institute of Electrical and Electronics Engineers U.S.A. (IEEE Wiring Regulation UK).
- BSS - British Standard Specifications
- VDE - Verband Deutscher Electro-technical (Association of German Electrical Engineers)
- NEMA - National Electrical Manufacturers Association, U.S.A.



- PSI - Pakistan Standards Institution
CIE - Commission Electro-technique International

1.4 TESTING

1.4.1 Factory Tests

a. General

All type and routine tests on switchgear and all other equipment shall be performed at the manufacturer's works in the presence of the Engineer or his representative. Type tests may be waived off in case test certificates as certified by an approved standard laboratory of international repute are provided by the Contractor and approved by the Engineer. Submission or merely producing the type test certificates shall not relieve the Contractor to carry out the required standard/routine tests.

The Contractor shall arrange at his own cost factory visit(s) for pre-shipment inspection/testing for all major electrical equipment offered. Airfare to and from inspector's home town (two persons), boarding, lodging and transport shall be Contractor's, responsibility and all costs in this respect shall also be borne by the contractor.

In addition, for all pre-shipment inspections carried abroad, the Contractor shall provide (for two persons) daily allowance @ 200 US\$ per day for out of pocket expenses, at per diem rate per person currently recommended by Chamber of Commerce and Industry for foreign travelers on business visa. The number of days shall be actual days spent in travel from and to the home town of the concerned inspector but not less than five (5) days. The 200 US\$ per day per person in cash shall be provided before start of travel from hometown.

For all pre-shipment inspections carried out within Pakistan, the Contractor shall provide (for two persons) daily allowance of Rs. 2,000 for out of pocket expenses, at per diem rate per person. The amount shall be provided in cash before start of travel from hometown for the entire duration of the visit.

The Contractor shall inform the Engineer about the date and time of test of each equipment at least two weeks in advance. The witnessing of test by the Engineer or his representative shall not absolve the Contractor from his responsibility for the proper functioning of the equipment, and for furnishing the guarantees. All test results shall be supplied in triplicate.



b. Insulation Resistance Test

Insulation resistance test shall be made on all Electrical equipment by using a meggar of 500 volts for circuits upto 250 volts and 1000 volts for circuits between 250 and 500 volts.

The insulation resistance values of cables, switchgear, etc., shall be as per BSS, IEC and Pakistan Electricity Rules.

1.4.2 Field Tests

a. General

Upon completion of the installation, the Contractor shall perform field tests on all equipment, materials and systems. All tests shall be conducted in the presence of the Engineer for the purpose of demonstrating equipment or system compliance with Specifications. The Contractor shall submit for Engineer's approval complete details of tests to be performed describing the procedure, test observations and expected results.

The Contractor shall furnish all tools, instruments, test equipment, materials etc. and all qualified personnel required for the testing, setting and adjustment of all Electrical equipment and material including putting the same into operation.

All tests shall be made with proper regard for the protection of the personnel and equipment and the Contractor shall be responsible for adequate protection of all personnel and equipment during such tests.

The Contractor shall record all test values of the tests made by him on all equipment. Three (3) copies of all test data and results certified by the Engineer shall be given to the Engineer for record purposes. These shall also include details of testing method, testing equipment, diagrams etc.

b. Earth Resistance Test

Earth resistance test shall be made by the Contractor on the earthing system, separating and reconnecting each earth connection.

If it is indicated that soil treatment or other corrective measures are required to lower the ground resistance values, the Engineer will determine the extent of such corrective measures.

The Electrical resistance of the ECC together with the resistance of the earthing leads measured from the connection with earth electrode to any other position in the complete installation shall not exceed five ohm.



Earth resistance test shall be performed as per Electrical Inspector's requirements. Where more than one earth electrodes are installed, the earth resistance test of each electrode shall be measured by means of resistance bridge instrument.

c. Switchgear Test

Each circuit breaker shall be operated electrically and mechanically. All interlocks and control circuits shall be checked for proper connections in accordance with the wiring diagrams furnished by the manufacturer.

The Contractor shall properly identify the phases of all switchgear and cables for connections to give proper phase sequence.

Trip circuits shall be checked for correct operation and rating of equipment served. The correct size and function of fuses disconnect switches, number of interlocks, indicating lights, alarms and remote control devices shall be in accordance with approved manufacturer drawings. Name plates shall be checked for proper designation of equipment served.



SP-2 POLES FOR ROAD LIGHTING

2.1 SCOPE OF WORK

The work under this section consists of designing, manufacturing, supplying, installation testing and commissioning of the street lighting poles and accessories as specified herein, or as shown on the Tender Drawings and given in the Bill of Quantities.

The Contractor shall discuss the electrical layout with the Engineer and coordinate at site with other services for exact location and position of the electrical poles.

The poles with accessories shall also comply with the General Specifications for Electrical Works Section-8001 and with other relevant provisions of the Tender Documents.

2.2 APPLICABLE STANDARDS/CODES

The latest editions of the following standards/codes shall be applicable to the material specified within the scope of this Section:

ASTM A36 - Steel for Pole and Base Plate

ASTM A307 - Anchor Bolts

BS EN ISO 1461 - Galvanization

ASTM A123 & A385 - Galvanization

2.3 CONSTRUCTION OF POLES

The galvanized steel poles shall be of mild steel as shown on drawing from base plate to lantern connection, well proportioned and neatly finished. The height of the pole from the centre line of the spigot for lantern connection to the ground line and out-reach of each arm from the vertical centre line of the pole to the tip of the spigot for lantern attachment shall be as shown on Drawing. Approval of the Engineer shall be obtained before ordering the poles for manufacturing.

The pole (vertical portion) alongwith base plate shall preferably be in one piece. But if manufacturing in one length is not possible, it can be in two or three pieces with force fit lap joint.



The steel poles after fabrication shall be galvanized by hot dip process (inside and outside) as per applicable standards '-Hot Dip Galvanized Coatings on Iron and Steel Articles'. The poles shall be prepared before galvanizing by removing grease, burs and slag etc. so that zinc coating is adherent, dense, smooth, continuous and uniform. The Contractor shall ensure before placing of order that the firm has adequate facility for hot dip galvanizing process as per standard practice. The steel used in the manufacture of poles shall be made by open hearth or electric furnace process.

The straight portion of the pole shall be truly vertical and no deviation more than 100 mm in the entire length shall be accepted.

Other tolerances shall be as follows:

- Outside diameter = +/- 1%
- Wall thickness = +/- 10%
- Overall length of pole = +/- 0.5%
- Weight = - 0.3%
+ not limited.

The pole and the bracket shall be so designed that when subjected to wind at a velocity of 160 km/hour on the full projected area of pole, bracket and the lantern a factor of safety of 3 on minimum tensile strength of the material shall be obtained. In addition, the temporary horizontal deflections at the lantern position shall not exceed 1/40 of the length of the pole above ground at aforementioned wind velocity.

The poles shall have a base compartment, designed to accommodate a loop-in services cutout for 4 core PVC/SWA/PVC cables of given sizes. A 8 mm stainless steel stud complete with nut and washers shall be provided in the base compartment of the pole for earthing purpose.

The edges of the door opening on the pole shall be reinforced with a 10 mm thick M.S. square bar to reinstate the strength of pole at this location. The opening cover shall consist of weather proof hinged door. The door shall be provided with a heavy duty non-rusting lock.

Flag brackets shall be fitted to poles if shown on the drawing and shall be as approved by the Engineer.



2.4 INSTALLATION

Lighting poles shall be handled/transported and erected in such a way so as to avoid any damages. Any damage to pole or galvanizing shall be made good to the satisfaction of the Engineer.

The lighting poles shall be stored clear of soil, ground water or other rust producing materials. The fixing of poles shall be carried out in accordance with manufacturer's instructions and good engineering practice.

The poles shall be erected in a true vertical position.

Where lighting poles are to be installed in the vicinity of overhead power lines, the Contractor shall inform the Engineer and act as directed. He shall maintain clearances as per WAPDA requirements from the power lines.

The Contractor shall number all the poles with high quality paint using stencil for 50 mm high lettering. The numbering shall be at 1200 mm from the bottom of pole towards the road. The numbering shall be in a manner as directed by the Engineer.

Earth backfill around pole foundation shall be done in 150 mm thick layers and shall be well rammed and compacted to provide full lateral support.

2.4.1 Data to be submitted

Before manufacturing, the Contractor shall submit for approval of the Engineer, the shop drawing of the pole anchor bolts, base plate and pole bracket together with details of the base compartment, cover and the means adopted for making it waterproof and tamperproof. Design calculation sheets for the poles from manufacturer shall also be submitted by the contractor to show that poles/foundations are safe for all specified stresses.

2.5 TESTS

2.5.1 General

The poles shall be tested and the results recorded for each test by the manufacturer in the presence of an authorized representative of the Owner or Engineer as stated below.

2.5.2 Inspection

Prior to inspection, checklist shall be submitted pertaining to fabrication of each pole lot duly filled in by the manufacturer.



The material, weight and dimensions of poles as specified shall be certified by the manufacturer. The poles shall be inspected and in case being found below the limits of tolerance as aforementioned, shall be rejected.

2.5.3 Sample Test

Sample of poles shall be selected at random basis from each lot of high masts and poles and shall be checked in accordance with the project specific requirements, BoQ, relevant construction drawings and applicable manufacturing standards. Factory routine test certificates shall be submitted by the manufacturer for each type of high masts/poles.

2.5.4 Galvanizing

Weight, uniformity of coating and other requirements shall be strictly inspected in accordance with applicable standards.

2.5.5 Service Cutouts

Each pole shall be provided with a waterproof and dust tight loop-in-service cutout accommodated in the base compartment of the pole.

The junction box shall comprise two (2) 2A MCB, for double arm poles and one (1) 2A MCB in accordance with IEC 60947 for single arm poles, a solid neutral link and an earthing terminal. It shall incorporate arrangements for looping "IN" and "OUT" for 4 core up to 25 mm² PVC/SWA/PVC cable having copper/aluminium conductor. The earth terminals, nuts and washers shall be adequately sized to take the earth continuity conductors with tight connections.

Dimensional drawings and details of the junction cutout box of pole shall be submitted for approval to the Engineer.

2.6 MEASUREMENT AND PAYMENT

2.6.1 Measurement

Measurement shall be made for the number of poles including all accessories and foundation block acceptably supplied and installed by the Contractor as shown on the drawing.

2.6.2 Payment

Payment shall be made for the number of units measured, as provided above, at the contract unit price each, and shall constitute full compensation for supplying, installing, connecting, testing and commissioning of each pole



including junction cutout box.

The galvanized steel poles shall be of mild steel as shown on drawing from base plate to lantern connection, well proportioned and neatly finished. The height of the pole from the centre line of the spigot for lantern connection to the ground line and out-reach of each arm from the vertical centre line of the pole to the tip of the spigot for lantern attachment shall be as shown on Drawing. Approval of the Engineer shall be obtained before ordering the poles for manufacturing.



SP-3 LUMINARIES

3.1 Description of Scope of Contract

Manufacturing, supply, installation, testing and commissioning of Light Emitting Diode (LED) Road Lighting Fixtures of make/model of Philips, GE or equivalent, conforming to the international standards, suitable for ME 1, ME 2 and ME 3 roads, with built-in flexibility in the optical system for each of the wattage groups as specified:

3.2. Major Contract Components

The major contract components are the lighting design calculations for project specific requirements, design & manufacturing, type testing (or test reports from independent laboratories on similar fixtures), factory acceptance testing, supply/transportation to site, installation at site, site acceptance testing & commissioning and maintenance & local support during Four (04) years warranty period of LED Road Lighting Fixtures after defect liability period of one year and the associated equipment/hardware thereof.

3.2.1 Lighting Installation Period

The installation period may vary as per project specific requirements. However, the delivery schedules are defined in the Tender Documents.

3.2.2 Specifications

3.3 General Requirements

3.3.1 Housing

The fixture shall have a full die cast aluminum housing providing adequate rigidity, strength and heat dissipation. Bidder to provide the manufacturing standard details.

The housing shall have integrated driver and LED lamp compartments for better heat dissipation and convenience in maintenance at the site, and shall feature multilayer optic with highly reflective components to increase light output.

The optical LED compartment shall have thermally hardened (Tempered) glass cover and high quality silicon gaskets. The glass shall be extra-white for maximum light transmission. The glass cover shall be tightly secured with the housing.



The bidders/supplier/manufacturer shall submit the samples of each wattage/type/model of the fixture being offered along with its submittal.

3.3.2 Optics

The fixtures for the project shall have flexible optical systems for the wattage range in the respective group.

The fixture shall use high efficiency (greater than or equal to 90%) LED and optics system.

The Light Output Ratio (LOR) shall not be less than 85%.

The fixture shall offer composite system efficiency above 120 lumen/Watt (tolerance of +/-5%).

The lens system design and high efficiency LED shall facilitate maximum spacing between the road lighting poles and coverage of wider roads.

The multilayer optics design shall ensure adequate luminance and illuminance uniformity in the unlikely event of an individual LED failure.

The fixture shall offer choice of narrow, medium and wide beam light distribution.

The optical lens system shall feature long life with no discoloration (UV protection), highest possible light transmission and having high reflectivity for maximum light output.

3.3.3 Surge Protection

The lighting fixture shall have surge protection to protect the electronic driver and LED system. Minimum surge protection rating shall be 10 kV.

SPD should comply to IEC 61347-2-11 and should be listed in Luminaire IEC 60598-2-3

3.3.4 IP Protection / Impact Resistance

The complete fixture including lamp and gear compartments shall have minimum ingress protection class IP66 for Road Lights and IP65 for Flood/tunnel Lights for long reliable performance and minimal maintenance requirement and an Impact Resistance of IK08 or above(Road Lights) and IK07 or above(Flood/tunnel Lights). No chemical glue shall to be used as that may cause breakdown of water-proof and dust-proof seal. All Synthetic material shall be 100% UV stable and scratch resistant.



3.3.5 Design of Fixture w.r.t Maintenance

Both the driver and LED compartments shall be designed to be easily accessible for maintenance. Whatever method of i.e clamps/screws for securing/assembling of fixture is used, it is to be ensured that the fixtures are designed in a manner so that frequent opening/closing at site during maintenance does not compromise its ingress protection (IP) rating and the various components like terminal blocks, LED drivers etc. are not dislocated from their designated position.

Gaskets are to be properly secured in special groves made for the same and must not be fixed to the body by any adhesive material.

The components inside the gear compartment like LED drivers, terminal blocks etc. must be easily detachable by using plug and play connectors/terminals to ensure ease of replacement at site and to be secured in the body of the fixture making special mounting arrangements so that the same are not dislodged/dislocated from their designated position.

3.3.6 Mounting

The mounting of the fixture shall be in axial orientation through suitable sized sidearm. The means for attaching the luminaire or external part to its support shall be appropriate to the weight of the luminaire or external part.

3.3.7 Future Compatibility

The fixture shall be fully compatible with future LED upgrades when they become available. It shall have a modular design to upgrade / replace with new LED modules or LED drivers at site conveniently with minimum effort. All electronic components/ drivers shall be mounted in a manner so that they are easily accessible and replaceable during maintenance. Lamp compartment shall have an easy access for opening and closing at site.

3.4 LED Driver/Electronic Control Gear for LED Modules

The LED driver shall be designed to operate large array of high powered LEDs through current controlled output. The driver shall be suitable for 230V, +10%, -15%, 50Hz, single phase mains AC supply.

The LED driver shall have an efficiency of at least 90%.

The LED driver shall have energy saving/dimming options. So, that the driver can be easily programmed at site in a manner that different output wattages are available from the same fixture as per requirements. In the late night



mode the fixture can thus be operated at various reduced wattages as per traffic conditions to have an energy efficient use.

The LED driver shall be of Philips, Meanwell, GE, Schwabe or Lightech Make or equivalent (duly type tested as specified and in full conformance to the technical requirements/specifications).

The driver shall have Power Factor (PF) >0.90 at maximum load.

3.5 **LEDs**

The LED chip shall be Philips Lumiled, Cree, Nichia or Osram make or equivalent (duly type tested as specified and in full conformance to the technical requirements/specifications).

The LEDs shall:

- Be designed for lumen maintenance of L70 or 70% at the end of useful life at ambient temperature of 35 °C.
- Have a useful life of 50,000 burning hours at 50 °C.
- Have a minimum color rendering index (Ra) of 70 (+10/-10) and a color temperature above 5000K.
- Have a color consistency within 7 SDCM (standard deviation of color matching) as defined by MacAdam.

The bidder shall submit the exact details w.r.t the model number, binning efficacy, CRI/CCT, LM 21 calculations of LED chip/wafer being used in the fixtures manufactured by them.

3.6 **Thermal Management**

Managing thermal properties in LED fixtures is most critical to ensure optimum performance of LEDs and reliability of the system.

The housing under the circuit board shall be specially designed to ensure perfect contact between the board and the fixture housing for efficient heat dissipation.

PCBs used shall maximize the heat transfer process and to offer reinforced electrical insulation via dielectric layer. The PCB shall be mounted on the housing using a highly efficient thermal interface material. Use of Silicon glue is not acceptable. The PCB used shall be from a reputed PCB manufacturer offering fully traceability of the product along with its serial number/identification numbers to ensure quality of the product.



The housing shall have additional ribs and shall also have adequate surface area to ensure fast heat dissipation.

3.7 Photometric

Fixtures shall have Illumination Engineering Society (IES) Type II or III distribution pattern, with short or medium longitudinal distribution.

LM-80 LED and photometric test reports and IES files from a third party testing Laboratory/authenticated source shall be available.

Photo Biological Safety:

Ensure luminaries comply with Photo biological Safety of lamps and lamp systems in accordance with the requirements of BS EN 62471:2008 or ANSI/IESNA RP-27. 3-0.

Provide proof of testing and compliance to the standards along with certification provided to prove the fixture is classed as "Exempt" or Risk one. (The main target is to show up passed for blue rays toxic effect on retina)

Required Lighting Levels:

Unless otherwise mentioned, LED street lighting suppliers shall follow CIE115, including M1, M2, M3, M4 lighting levels as per applications and given parameters.

A maintenance factor of 0.75 shall be used on all lighting calculations, provided that the supplier need to submit lighting calculations at MF of 1 represents the day one measurements shall be submitted along with 0.75 calculations.

3.8 Warranties & Maintenance

The complete fixture including all accessories shall have at least four (04) years warranty, after one year of Defect Liability Period (DLP), against any manufacturing defects and failures.

3.9 Applicable Standards and Codes

The fixtures shall conform to the following latest standards and codes. It shall be the mandatory requirement that the bidder shall submit detailed type test reports from certified international testing agency / laboratory / body to establish its conformance to the specified international standard.



- IEC 60598-1
- IEC 60598-2-3 (Road & Tunnel Lights)
- IEC 60598-2-5 (Flood Lights)
- LM-79 for the luminaries being offered (Model/Wattage specific)
- LM-80 for LED chip being used
- LM-82-12 (Model/Wattage specific)
- IEC 62471 (For the complete fixtures being offered as well as for the LED Chips)
- EN 55015 : 2006 and 2007 – Limits and methods of measurement of radio disturbance characteristics of electrical lighting
- EN 61547 : 1995 / +A1 : 2000 – Equipment for general lighting purpose EMC immunity requirements
- EN 61000-3-2 : 2006 – Limitation of harmonic current emission
- EN 61000-3-3 : 2008 – Limitation of voltage fluctuation and flicker
- EN 62493- Assessment of lighting equipment related to human exposure to electromagnetic field (environmental friendly)
- Thermal management test (UL 1598) (Model/Wattage specific)
- IP Degrees of protection provided by enclosures (IP Code)
- Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)

The LED driver shall conform to following latest standards and codes:

- EN61347-1: Lamp control gear general and safety requirements
- EN61347-2-13: particular requirements for DC or AC supplied electronic control gear for LED modules
- EN62384: DC or AC supplied electronic control gear for LED modules performance requirements
- Technical and descriptive data and drawings.

3.10 Technical and Descriptive Data and Drawings

Technical and descriptive data and drawings to be submitted shall include but not be limited to the following:

- Technical data of fixtures and driver
- IES photometric file(absolute photometric data)
- LM-79 test report for each of the fixture type/wattage being offered.
- LM-80 test report of LED used
- LM-82-12 (test report) of the fixture type/wattage being offered.
- Thermal management test report (UL 1598) of the fixture type/wattage being offered.
- EN 62493- Test report
- IK rating test report
- Lumen depreciation test report at 1000, 2000, 3000, & 6000 burning hrs.
- 3rd Party IEC 60598 test reports.



- Vibration test report
- EMC test report
- Salt spray test report
- Photo- biological safety test report
- Customer testimonials
- Factory ISO certificate
- Reports of other type tests stipulated in the respective standards/codes
- Country of origin, Manufacturing works/ factory details, premises & QA & QC procedures, in-house testing procedures, routine testing procedures/protocols with traceability mechanism on light fixtures being manufactured and testing equipment details w.r.t make/model & calibration available at premises shall be provided.

Contractor/Supplier shall be bound to furnish (if required) the original test reports for onward confirmation/verification/authentication of the relevant parts/results/calculations of the test reports as required from the testing Laboratory.

Supplier/manufacturer shall be bound to arrange for the third party testing of the LED lights from approved accredited laboratory by third party of international repute prior to placement of order.

3.11 International Independent Laboratories

For the specified requirements of type tests and type test reports by an independent authority/independent laboratory (specific to their status/approval for performance of specific test(s) on the fixtures as defined in the project), the following laboratories shall be considered as independent laboratories:

- DEKRA (KEMA) Labs, Holland.
- CESI Labs, Italy.
- CRIEPI Labs, Japan.
- Any other laboratory accredited by EA (European Co-Operation for Accreditation) or a member thereof.
- Any other laboratory accredited by ILAC (International Laboratory Accreditation Cooperation) or a member thereof.
- Any other laboratory accredited by IAF (International Accreditation Forum) or a member thereof.
- Any other laboratory accredited by STL (Short-Circuit Testing Liaison) or a member thereof.



SP-4 CONDUITS AND PIPES

4.1 DESCRIPTION

When cables cross road, paved area or other services, they shall be laid in protective pipes of required size. The pipe ends after installation of cable shall be plugged to make them watertight by means of bituminized hesian or equivalent material.

Conduits/ pipes/ ducts for electrical cables shall be properly sealed with the water proofing material "Plastic Polyurethane Foam" as per relevant ASTM standard to avoid rain water entry to the conduits. The contractor shall also provide the technical data of the sealant material before the execution of the work.

4.2 GENERAL

The extent of works shown on the drawing does not indicate the exact position of conduits and pipes. The Contractor shall ensure exact location and route of conduit and pipes in coordination with other services drawings, as per site requirements and as directed by the Engineer.

4.3 APPLICABLE STANDARD/CODES

Latest editions of the following standards / codes shall be applicable for the materials in scope of this Section:

- BS 6099 - PVC conduits and accessories.
- BS 3595 - PVC pipes & accessories.
- BS 4346 - Cement Solvent for jointing

4.4 MATERIAL

4.4.1 PVC Conduits and Accessories

The heavy gauge PVC conduits and accessories conforming to BS6099 shall be generally used. The PVC conduits and accessories of light gauge may be used on the project with the concurrence of the Engineer.

The PVC bends, sockets, elbows, couplings, etc. shall conform to the same specifications as for the conduits. The PVC bends shall have enlarged ends to receive conduit without any reduction in the internal diameter at joint. Manufactured smooth bends shall be used where conduit changes direction.



Bending of conduits by heating or otherwise will not be allowed in any situation. The use of sharp 90-degree bends and tees will not be allowed for concealed wiring.

The round PVC junction boxes for ceiling light or fan points shall have minimum dimensions of 63-mm diameter and depth. The junction boxes for wall light points shall have minimum dimensions of 63-mm diameter and 38 mm deep. Round junction boxes shall be provided with one piece PVC cover plate fixed to the box by means of brass screws.

4.4.2 PVC Pipe and Accessories

The PVC pipe shall be rigid. All pipes shall be minimum Class D, unless otherwise stated on drawings or bill of quantities. The buried PVC pipe should be able to withstand the external load acting upon it by continuous movement of heavy duty vehicles such as trucks. Cranes, forklift, etc. Where pipe change direction, manufactured smooth bends shall be used. Bending of pipes by heating or otherwise will be allowed in special cases only. Bending of pipes by heating shall be carried out by first filling the pipe with sand inside and then immediately removing the sand. The use of sharp 90-degree bends and tees will not be allowed. The bends shall conform to same specifications as given for PVC conduits. for joining of pipe all precautions and procedures recommended by manufacturer shall be followed.

4.5 INSTALLATION

4.5.1 Concealed Conduits

Where concealed conduit system as stated on drawings, the conduit shall be installed concealed in roof, wall, column, etc. Conduits shall be laid underfloor only where specifically stated.

When concealed the conduit shall have a minimum of 32-mm cover of concrete measured from the top of conduit to finished surface. In the reinforced cement concrete (RCC) work the conduit shall be laid before pouring of Concrete. Under no circumstances shall chases be made in the RCC structure for concealing conduit and Accessories after pouring of concrete. The conduit shall be supported on top of bottom reinforcement of slab. All outlet boxes to be firmly supported and installed such that they finish flush with the soffit of slab or beam.

Where conduits have to be concealed an cement concrete (CC) work after concreting or in block masonry chase shall be made with appropriate tools and shall not be made deeper than required. The conduit shall then be fixed firmly in the recess and covered with cement concrete mixture. The work of cutting in the cement concrete work or block masonry work shall be



coordinated with the civil work. The Contractor shall obtain approval from the Engineer before starting chasing and cutting.

The termination of conduits at or near the equipment switchboard as shown diagrammatically on the drawings. The exact locations of the termination shall be coordinated with the equipment/switchboard to be installed. Any extension of conduit to suit the site condition shall be made without any extra cost. Conduit ends pointing upwards or downwards shall be properly plugged in order to prevent the entry of foreign materials. All openings through which concrete may leak shall be carefully plugged and boxes shall be suitably protected against falling with concrete. At all terminations of conduit sharp edges of conduit ends shall be prevented to avoid the cutting or damaging of wire or cables during pulling through the conduits.

Under floor conduit shall be installed at a minimum depth of 2 inches from the finished floor level or as shown on the drawings. The conduits shall be installed empty before finishing of floor or in RCC work with a 18 SWG steel wire drawn through the conduit for pulling cable. No conduits shall be laid under floor in bathroom.

The entire conduit system shall be installed and checked before wiring as carried out. Any obstruction found shall be cleared before the installation of cable. Pull boxes and adaptable boxes shall be provided an conduit runs wherever required to facilitate pulling operation. The drawings are diagrammatic and do not indicate the position and spacing of pull boxes or adaptable boxes. However, these shall meet the following requirements.

- Pull boxes
- For straight runs the spacing shall not be more than 180 feet
- For runs with one 90degree bend the spacing shall not be more than 90feet
- For runs with two 90degree bends the spacing shall not be more than 40feet
- Adaptable boxes
- For conduit upto 1-inch dia. the boxes shall be 2 inch in depth
- For conduit upto 1-1/2 inch dia. the boxes shall be 2-1/2 inch in depth
- For conduit upto 2-inch dia. the boxes shall be 3-1/2 inch in depth



The rectangular inspection boxes or pull boxes shall be 18 SWG heavy gauge sheet steel of suitable design to receive conduits. The box shall be painted inside and outside with black enamel paint over a base coat of red oxide primer paint. The minimum length of inspection box shall not be less than four times the cable manufacturer's recommended Bending radius of the cable. All concealed type pull boxes shall have a white plastic sheet of appropriate size fixed to the box by means of galvanized screws.

Adaptable boxes shall be 18 SWG sheet steel and painted and finished to the same quality as the Lighting distribution boards.

Wherever the conduit lengths cross the expansion joint either along the columns or slab suitable arrangement shall be provided so that when the conduit lengths in the expansion joint are stressed the conduit shall not crack or break.

4.5.2. PVC Pipe

Rigid PVC pipes shall be installed under roads and paved areas, at crossing with other services and at cable entering building as shown on the drawings. The depth of the pipe shall vary according to the conditions at site, and approval of Engineer shall be obtained prior to installation. In general the pipes shall be installed underground at the following depths measured from the top of the pipe:

- a) Under roads and paved surface 900 mm below the finished surface
- b) When crossing other services 250-mm vertical clearance.
for the crossing length. 500 mm horizontal clearance
with CC protective cover.

The trench of required dimensions shall be excavated and the bottom of trench cleaned and leveled. A Four-inch thick bed of fine sand shall be provided over which the PVC pipes installed after proper alignment. Where two or more pipes are installed in the same trench the clearance between pipes shall not be less than Two inches. After laying of pipe the trench shall be backfilled with clean-screened earth in layer of Four inches. Each layer shall be properly compacted.

Where underground cables enter connection terminal boxes the PVC pipe shall be installed on surface by means of PVC clamps at a maximum interval of Eighteen inches.

After installation, the ends of the pipe shall be plugged with material impervious to water and chemicals. All joints shall be sealed adequately to prevent entry of foreign elements.



The installation of pipes shall be completed in all respects including its fixing at terminations, before cabling work is started. All sharp edges and burrs shall be removed by using reamer or any approved device. The pipe shall be thorough cleaned of dirt and dust from inside. the pipes shall be installed in proper co-ordination with other works.

4.6 MEASUREMENT AND PAYMENT

4.6.1 General

The Contractor's bid amount against each Bill of Quantities item as given below shall include supplying, installation and completion for all work specified herein and as shown on the Tender drawing related to the item.

4.6.2 PVC Conduits

4.6.2.1 Measurement

Measurement shall be made for the number of running feet or running metres of conduits acceptably supplied and installed by the Contractor as a complete unit.

4.6.2.2 Payment

Payment shall be made for the total numbers of units measured, as provided above, at the Contract unit price each. The payment shall constitute full compensation for supplying, installing and completion of the laying of the conduits including jointing materials and accessories. The complete work wherever applicable shall include cutting/ chasing of civil work, for concealed conduit system, excavation and backfilling of ground for underground pipes painting, plugging, bitumen coating, etc., as applicable for each type of work.

4.6.3 PVC Pipes

4.6.3.1 Measurement

Measurement shall be made for the number of running feet or running metres of pipes acceptably supplied and installed by the Contractor as a complete unit.

4.6.3.2 Payment

Payment shall be made for the total numbers of units measured, as provided above, at the Contract unit price each. The payment shall constitute full compensation for supplying, installing and completion of the laying of the PVC pipes including jointing materials and accessories.



SP-5 LT CABLES

5.1 DESCRIPTION

The cable manufacturer shall be certification holder of ISO-9002 and shall be approved by the Engineer. The cables for road lighting shall be PVC insulated and PVC sheathed, 600/1000 Volt grade, designed, manufactured and tested in accordance with IEC-60502 or other equivalent international standards.

For lighting system the cables shall be single or multicore as required with stranded copper or aluminum conductors and polyvinyl chloride heat and moisture-resistant insulation of the thickness listed in IEC or British Standard.

The route of the cables shall be as shown on the drawing. Any change in route required due to site conditions shall be made in relation with other service layout and with the approval of the Engineer.

5.2 MATERIAL REQUIREMENTS

The cable shall be suitable for operation at conductor temperature upto 70° C under normal conditions.

Conductors shall be of high purity electrolytic annealed copper or aluminum wires and shall conform to the requirement of the following BS or equivalent standard.

If armouring is required it shall consist of galvanized steel wires complying with BS 1442 and shall provide conductivity not less than 50% of the phase conductor.

- BS 6746: - PVC insulation and sheath of electric cables
- BS 6360: Copper or Aluminum conductors in insulated cables and cords
- IEC 60228: - Conductors of insulated cables

5.2.1 Cable Sizes

The sizes of LT copper conductor cables shall be as shown on the drawings. Care shall be taken so that voltage drop at the far end of the cable does not exceed 5% of the nominal voltage. Cables manufactured by the reputed firms shall be used, provided they fulfill all the requirements of the specifications.



5.2.2 Phase Identification

All cables shall have phase identification colour on the insulation of each core. The colour code of three phase circuits shall be red, yellow and blue for phase conductors and black for neutral conductor. From pole junction box upto lantern green or green and yellow striped PVC insulated wire shall be used as earth continuity conductor (ECC).

For all cables, to be supplied and installed, the Contractor shall submit complete technical data, including conductor material, insulation material, current carrying capacity, Voltage grade, weight for 100 metres etc. and all such data shall be supported by test certificates, current and temperature rise curves etc. for approval of Engineer.

5.2.3 Cable Accessories

All accessories shall be provided without additional cost for the complete cabling and wiring system. These shall include but not be limited to items such as clamps, fixing channels, connectors, cable joints (where necessary and as approved by the Engineer), clips, lugs, tapes, solders, identification tags, bushes & glands etc.

5.2.4 DATA TO BE SUBMITTED

The Contractor shall submit the following for approval of the Engineer before execution:

- Manufacturer
- Country of Origin
- Catalogue with indication of equipment proposed
- Detailed Specification
- Construction drawings

Compliance of the following shall be required:

- 1) In-process testing and tests after manufacturing (each size/type) to be supplied, as per national and international standards (as applicable) specified particularly for the project for which the cable will be ordered, including but not limited to:
 - a) Single / Multi-core Cable Manufacturing as per applicable BS or IEC standards schedule of testing.
 - b) Tests on completed cables in accordance with BS standard 6004 & BS 6346 or equivalent IEC standard / codes.



- 2) Routine tests shall be carried out from independent laboratory in the presence of Client / Consultant representatives. Review/approval of these test reports shall be carried out by the Client/Consultants.
- 3) In advance availability of sources / supporting documents with regard to material sources vis-à-vis imported Copper (in accordance with the mandatory requirements of imported copper laid down in the market input rates of material, Finance Department, Government of the Punjab), PVC used in the manufacturing of the cables ordered for a particular project including sales tax invoices from the respective material source and reconciliation quantity of the material procured with the manufactured cables. The import documents of material should consist of the following:
 - Bill of exchange.
 - Commercial invoice.
 - Packing list.
 - Beneficiary certificate.
 - Test report of Material (Copper Rod).
 - Shipment advice.
 - Bill of lading.
 - The vendor from which imported copper is purchased should be approved / registered with LME
- 4) Certificate of Registration from the client shall be submitted.
- 5) Cable inspection test protocol/procedure shall be furnished.
- 6) Pre-shipment / delivery inspection shall be carried out at Manufacturing Works of the cable manufacturers.
- 7) The samples from the cable drums supplied at site shall be taken and collected by the contractor in the presence of Client/consultant representatives for testing of same from UET or PCSIR Lahore in line with applicable standards / codes and test report of the same shall be submitted accordingly.

5.3 CONSTRUCTION REQUIREMENTS

Power supply to the poles at the road crossing shall be with PVC insulated PVC sheathed cable passing through pipe as specified and as shown on the drawings. Individual pole connections shall be by means of the power supply cable looping between poles. The cable from lighting control box shall enter first lighting unit at its three phase and neutral service cut-out and then similarly looped to the next. The luminaries on each pole shall be connected alternately to each of the three phases.

Cable routes shall consist of trenches or 100 mm PVC pipe as suitable or as



shown on the drawings. The cable if laid in trench shall be at least 500 mm below the general ground and 750 mm below road (class-1) level, with sand cushion around cable and a layer of 230 mm wide bricks over sand along the entire route of cable. The bricks shall be laid in such a way to provide equal margin of cover on both sides of the cable.

Slack shall be left in cables for which purpose the cut lengths of cables shall allow about 3% more in the measured length between terminations (Engineer will verify the lengths of cables). At junction boxes, ample slack shall be left to prevent straining of cable joints due to settlement of cable trench.

For underpass luminaries PVC insulated, PVC sheathed, SWA cable shall be pulled through already laid/buried PVC pipes in underpass slabs. The pulling of cables through pipes shall be started only after the conduit (PVC) system is completely installed and all outlet boxes, junction boxes etc. are fixed in position. The cable shall be pulled in PVC pipes with care, preferably without the use of any lubricant. Where necessary, and after approval of Engineer, the cable manufacturers recommended lubricant shall be used. Use of any kind of oil or soap will not be permitted.

The wiring shall be continuous between terminations and looping-in system shall be followed throughout. Any joint in cables shall not be allowed. Slack shall be left in cables for which purpose the cut lengths of cables shall allow about 3% more in the measured length between terminations (Engineer will verify the lengths of cables). At junction boxes, ample slack shall be provided to facilitate repairs in future.

Cables, whether installed in bare ground or in pipes shall not be bent to a radius less than that recommended by the cable manufacturers.

Upon completion of cable installation, the Contractor will be required to undertake testing as approved by the Engineer or the concerned department and shall comply with IEE wiring regulations. The copies of test results shall be supplied to the Engineer.

Conduits/ pipes/ ducts for electrical cables shall be properly sealed with the water proofing material "Plastic Polyurethane Foam" as per relevant ASTM standard to avoid rain water entry to the conduits. The contractor shall also provide the technical data of the sealant material before the execution of the work.

5.4 MEASUREMENT AND PAYMENT

5.4.1 Measurement

Measurement shall be made for the number of running meters for each size



and type of cable complete with required accessories acceptably supplied and installed by the Contractor. For 2.5 mm² cable from junction box to lighting fitting lamp holder through hollow of pole, it shall be on each cable basis.

5.4.2 Payment

Payment shall be made for the number of running metres of each size of cable measured as provided above, at the contract unit price each and shall constitute full compensation for supplying, installing, connecting and commissioning, of the cables. Payment for 2.5 mm² cable from junction box to lighting fitting lamp holder shall be lumpsum on each cable basis.



SP-6 LIGHTING CONTROL PANEL

6.1 DESCRIPTION

The lighting control/distribution panel shall be of 14 SWG sheet steel fabricated, cubical type, totally enclosed, dust tight and vermin proof. These shall be complete in all respects with material and accessories, factory assembled, tested and finished all according to the specifications and to the normal requirements. The panel with all components and accessories shall be suitable for front operation and shall;

- be provided with adequate clearance from live parts so that flashovers cannot be caused by switching, vermins, pests etc.
- have all components rated for insulation class of 600 Volt minimum.
- have the components mounted so as to facilitate ease of maintenance from the front.
- be suitable for mounting on concrete foundation.

The lighting control panel shall be complete with detachable steel base frame for embedding in concrete foundation on site.

6.2 MATERIAL REQUIREMENTS

The road lighting control box shall be of 14 SWG, G.I. sheet and equipped with the following:

- One-set of three phase, neutral and earth busbars of rating as specified (site rating).
- One incoming moulded-case circuit breaker, breaking capacity & rating as specified.
- Outgoing circuit breakers, breaking capacity & rating as specified.
- Magnetic contactors as per rating specified.
- Photo-electric cell switches dust and water proof type and as per BS 5972 or WAPDA Specifications P-102 with upto date amendments.



One photo electric cell unit shall be provided to switch ON/OFF every contactor for control of lights. Photo-electric unit shall include a delay device to prevent the switching of lamps during transient changes in voltage. Each lighting circuit shall be equipped with Auto/Manual selector switch and ON/OFF push buttons for maintenance purpose without interference with the photo cell and the whole to be enclosed in the dust and vermin proof case. Since the lighting control panel is installed on road side, therefore its outer cover shall be plain, without electrical components. A brass batten holder with ON/OFF switch and 60 watt incandescent lamp shall be provided at suitable location in the panel to facilitate maintenance during night time. Doors with hinges shall be provided so as to give maximum access for cabling and maintenance and shall be fitted with lock. Three sets of keys shall be supplied along with road lighting control box.

All necessary interconnecting wiring within the control panel shall be carried out in the factory.

Cable glands and lugs shall be provided. Three sets for incoming outgoing 4-Core up to 35 mm² Copper conductor PVC/SWA/PVC cables.

A suitable earthing terminal shall be provided inside the box.

Crimping type lugs for incoming and outgoing copper cables shall be provided.

6.2.1 Moulded Case Circuit Breakers

Moulded Case Circuit Breakers shall be provided for each distribution feed circuit. The circuit breakers shall be in accordance with IEC 60947-2. The three phase fault level shall be in accordance with the circuit requirements. The I_{cu} of all MCCBs shall be equal to 100% of I_{cs} . All MCCBs shall be capable of operating at 50 °C.

Each circuit breaker shall have integral thermal overload and magnetic type short-circuit trip devices. The thermal release shall provide inverse time overload tripping and the magnetic release shall provide instantaneous tripping or short time delay tripping where necessary, to achieve discrimination with downstream protective devices during short circuit conditions.

6.2.2 Magnetic Contractors

The contactors shall be triple pole, 400 V continuous duty type. The main contacts shall be silver tipped, but type with double break per pole. Each contactor shall be provided with 230 V AC single phase operating coil, and minimum two normally open and two normally closed auxiliary contacts wired



upto terminals. But if more number of working auxiliary contacts are required then, these shall be provided according to the system requirements.

6.2.3 Indicating Lamps

Indicating lamps shall be suitable for flush mounting, complete with base and shall have rosettes of suitable colour.

6.2.4 Line-up Terminals

Line-up terminals wherever provided for control & power circuits shall be suitable for voltage and size of conductors as indicated on drawing.

The line-up terminals for controls shall be suitable for channel mounting. All necessary accessories such as end-plates, fixing clips, transparent label holder caps and label sheets with marking shall be provided.

6.2.5 Data to be Submitted

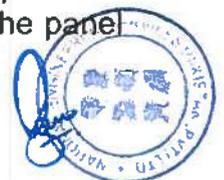
The Contractor shall submit the following for approval of the Engineer before execution;

- Manufacturer
- Country of Origin
- Catalogue with indication of equipment proposed
- Detailed Specification
- Construction drawings
- General arrangement and proposed foundation details.
- Details of materials used for weather and dust proofing.

6.3 CONSTRUCTION REQUIREMENTS

The road lighting control panel box shall be installed near transformer at location shown on the drawing. The Contractor shall ensure coordination with the civil contractor to avoid damage to the completed works. The Contractor shall provide foundation bolts and grout them in cement concrete with the approval of the Engineer. All installation material required for the satisfactory erection, such as bolts, nuts, washers, supporting steel etc. shall be provided and installed by the Contractor. The panel shall be installed upright and in level and shall be firmly and rigidly fixed on the concrete supports. Panel shall be erected as per manufacturer's instructions and as approved by the Engineer.

Loose parts dispatched by the manufacturer, shall be installed and connected as per assembly drawing. Any safety locking of metres, relays etc. provided by the manufacturer, for safe transport shall be released only after the panel



is installed in position. The Lighting Control Panel shall be tested and commissioned in the presence of the Engineer.

Panel openings for cables shall be properly sealed with the water proof material "Plastic Polyurethane Foam" as per relevant ASTM standard to avoid rain water/animal entry to the panel. The contractor shall also provide the technical data of the sealant material before the execution of the work.

6.4 MEASUREMENT AND PAYMENT

6.4.1 Measurement

Measurement shall be made for each panel complete with all components and accessories as given in bill of quantities acceptably supplied and installed by the Contractor as completed job.

6.4.2 Payment

Payment shall be made for the number of panels measured as provided above at the contract unit price each and shall constitute full compensation for supplying, installing, connecting, testing and commissioning of panels including bolts, supporting steel base, nuts, washers, tapes and earthing etc.



SP-7 EARTHING

7.1 DESCRIPTION

Earthing system as shown on the drawing shall be installed by the Contractor. The earthing system shall give earth resistance, including the resistance of soil, earth leads and ECC, equal to or less than one ohm.

7.2 MATERIAL REQUIREMENTS

7.2.1 Earthing by Earth Rods

The earth rod shall be of steel and shall be protected against rusting by a thick exterior layer of copper (not less than 0.33 millimeter), permanently molten or electrolytically deposited on a high strength steel core which shall provide rigidity for easy driving without bending. The earth rod shall have nominal dia of 16 mm with chamfered head of 2x45 mm (chamfer). The overall length of the rod shall be 3000 \pm 5 mm.

7.2.2 Earthing Lead

The copper conductor used for earth wire shall conform to the latest revision of IEC 228, IEC 228A. The size and number of individual conductor shall be as specified in the applicable standards.

7.2.3 Earth Continuity Conductor

Earth continuity conductor (ECC) shall be hard drawn bare copper wire, or single core PVC insulated copper conductor cable of given size. The earth continuity conductor shall be connected at one end to the earth rod through switch clamp/eye bolts as shown in the drawings at the other end to the relevant equipment to be protected as mentioned in the specification, BOQ and shown on drawing.

The specifications for single core PVC insulated cables used as ECC shall be same as those in relevant sections of technical specifications.

7.2.4 Data to be Submitted

The Contractor shall submit the following for approval of the Engineer before execution;

- Manufacturer
- Country of Origin
- Catalogue with indication of equipment proposed
- Detailed Specification
- Construction drawings



7.3 CONSTRUCTION REQUIREMENTS

7.3.1 General

For earthing of equipment proper size copper or brass thimbles or lugs shall be used to which the copper wire shall be connected by copper brazing. The soldering of copper wire at joints or terminations shall not be allowed. All tee-off connections shall be by copper brazing using suitable socket and clamps. After brazing, the jointed surface shall be protected by oxide inhibiting compound of low electrical resistance. For connections to metallic body, the surface shall be thoroughly cleaned before bolting the lug or socket.

The earth continuity conductor shall, in general, run in cable trench or in conduits/pipes. Where laid along underground cables, these shall be laid directly underground in unpaved areas and in pipe under paved areas.

7.3.2 Earth Continuity Conductor

The body of all lighting control panels shall be connected to earth by specified size of ECC. All other metal work shall also be connected to earth by suitable size of ECC so that earth resistance is less than five ohm.

At joints or terminations, the ECC shall be connected using proper accessories. No connection shall be made by twisting of earth conductors.

7.3.3 Earth Resistance Test

Earth resistance tests shall be done on the earthing system by separating and reconnecting conductor. The resistance of earthing leads in the installation shall not exceed one ohm.

Earth resistance test shall be performed as per Electrical Inspector's requirements.

7.4 MEASUREMENT AND PAYMENT

7.4.1 Measurement

For earth continuity conductors (ECC) measurement shall be made for each size of copper wires on per running meter basis acceptably supplied and installed by the Contractor.

7.4.2 Payment

Payment for copper rod type earth point shall be made for each point and provided as above at the Contract Unit price each and shall constitute full compensation for supplying, installing, connecting and testing including earth



rod, excavation, backfilling, civil work for inspection chamber, etc. as shown on the drawings. Payment of earth continuity conductors (ECC) shall be made for the number of running meters measured at the Contract unit price and shall constitute full compensation for supplying, installing & connecting including all installation accessories.



Environmental, Social, Health and Safety Requirements

MINIMUM ENVIRONMENTAL AND SOCIAL POLICY (STATEMENT) REQUIREMENT

The E&S Works' policy goal, as a minimum, shall be stated to integrate environmental protection, climate adaptation, land acquisition and resettlement, occupational and community health and safety, gender, equality, child protection, vulnerable people (including those with disabilities), sexual harassment, sexual exploitation and abuse (SEA), HIV/AIDS awareness and prevention and wide stakeholder engagement in the planning processes, programs and activities of the parties involved in the execution of the Works. The policy shall set the frame for monitoring, continuously improving processes and activities and for reporting on the compliance with the policy.

The policy shall include a statement that, for the purpose of the policy and/or code of conduct, the term "child" / "children" means any person(s) under the age of 18 years.

The policy shall, as far as possible, be brief but specific and explicit, and measurable, to enable reporting of compliance with the policy in accordance with the Particular Conditions of the Contract Sub-Clauses 4.8 and 4.20 (Part B – Specific Provisions) and Part D (ESHS Metrics for Progress Reports).

As a minimum, the policy is set out to the commitments to:

1. Comply with all applicable national laws and regulations, as well as AIIB's Environmental and Social Standards (ESSs).
2. Apply good international industry practice (e.g. World Bank Environmental and Health Safety Guidelines and other) to protect and conserve the natural environment and to minimize unavoidable impacts to minimize environmental impacts and promote sustainability.
3. Provide and maintain a healthy and safe work environment and safe systems of work by implementing robust occupational health and safety (OHS) management systems, including hazard identification, risk assessments, and emergency preparedness.
4. Protect the health and safety of local communities and users, with particular concern for those who are disabled, elderly, children or otherwise vulnerable.
5. Be intolerant of, and enforce disciplinary measures for illegal activities. To be intolerant of, and enforce disciplinary measures for inhumane treatment, sexual activity with children and sexual harassment, gender-based violence (GBV), sexual exploitation and abuse (SEA), child labor, forced labor, and human trafficking..
6. Incorporate a gender perspective and provide an enabling environment where women and men have equal opportunity to participate in, and benefit from, planning and development of the Works.
7. Work cooperatively, including with end users of the Works, relevant authorities, contractors and local communities.
8. Engage with and listen to affected persons and organizations and be responsive to their concerns, with special regard for vulnerable, disabled and elderly people.
9. Provide an environment that fosters the exchange of information, views and ideas that is free of any fear of retaliation, and protect whistleblowers.
10. Establish accessible grievance redress mechanisms (GRMs) in line with

Project GRM to ensure concerns are addressed promptly, fairly, and without fear of retaliation. Whistleblower protections must be guaranteed.

11. Minimize the risk of communicable diseases and to mitigate the effects of communicable diseases associated with the execution of the Works.
12. Monitor, evaluate, and report on ESHS performance regularly, with commitments to continuous improvement.
13. Ensure contractors and subcontractors adhere to this policy through contractual obligations and regular audits.

The policy shall be signed by the senior manager. This is to signal the intent that it will be applied rigorously.

MINIMUM ESHS REQUIREMENTS

All the project E&S instruments (namely but not limited to the ESIA, ESMP, LMP, SEP, RAP, GAP, ESAP,) shall be the integral and binding part of contract document. In case of any inconsistency between these document and other part of the contract, the provisions that provide highest level of E&S protection and compliance shall prevail.

Detailed specifications for ESHS requirements shall consider:

- Project reports, e.g., ESIA/ESMP and other E&S instruments such as LMP, SEP, RAP, GAP and EASP.
- Consent/permit conditions including NOC/Environmental approval from EP&CCD.
- Required standards including the AIIB Bank ESHS Guidelines.
- Relevant international conventions or treaties etc., national legal and/or regulatory requirements and standards (where these represent higher standards than the Bank ESHS Guidelines).
- Relevant international standards, e.g., WHO Guidelines for Safe Use of Pesticides.
- Relevant sector standards, e.g., EU Council Directive 91/271/EEC Concerning Urban Wastewater Treatment.
- Grievance redress mechanism including types of grievances to be recorded and how to protect confidentiality, e.g., of those reporting allegations of SEAH.
- SEAH prevention and management.
- Emergency Preparedness and Response including community notification procedures, incident notification to employer, engineer and employee. The contractor(s) shall notify the engineer and employer of any serious injury, major spill or GBV/SEA/SH related issue, significant E&S, OHS and CHS incident within 24 hour or as defined in ESIA/ESMP. Detailed investigation report as per ESIA/ESMP shall be submitted to the Engineer as per the timeline mentioned in ESIA/ESMP or other specific E&S instrument

The detail specification for ESHS are provided in ESMP (attached below) which will cover all the OHS, CHS, environmental and social protection, monitoring and reporting requirements, etc.

MINIMUM REQUIREMENTS FOR THE TREE CUTTING

The Section 2 of Phase 1A Project area/both sides of the road are located within the NHA-owned ROW and are therefore the property of NHA. The felling or uprooting of these trees will be carried out by the contractor engaged under the project with proper inventory establishment

and marking of tree. The felled trees will subsequently be handed over to the NHA via the Engineer. The separate contractor will be engaged by NHA for plantation of compensatory trees (at ratio of 1:10 with maintenance and monitoring of 5 year) as per the tree plantation plan provided in ESIA/ESMP.

REQUIREMENTS FOR THE TENDERER'S CODE OF CONDUCT

A satisfactory code of conduct will contain obligations on all Contractor's Personnel (including subcontractors and day workers) that are suitable to address the following issues, as a minimum. Additional obligations may be added to respond to particular concerns of the region, the location and the project sector or to specific project requirements.

The Code of Conduct shall address the following:

1. Compliance with applicable laws, rules and regulations.
2. Compliance with applicable health and safety requirements to protect the local community (including vulnerable and disadvantaged groups), the Employer's Personnel and the Contractor's Personnel (including wearing prescribed personal protective equipment, preventing avoidable accidents and a duty to report conditions or practices that pose a safety hazard or threaten the environment).
3. The use of illegal substances.
4. Nondiscrimination in dealing with the local community (including vulnerable and disadvantaged groups), the Employer's Personnel and the Contractor's Personnel (for example, based on family status; ethnicity; race; gender; religion; language; marital status; age; disability (physical and mental); sexual orientation; gender identity; political conviction; or social, civic or health status).
5. Interactions with the local community(ies), members of the local community(ies) and any affected person(s) (for example, to convey an attitude of respect, including to their culture and traditions).
6. Sexual harassment (for example, to prohibit use of language or behavior, toward women and/or children, that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate).
7. Violence, including sexual and/or gender-based violence (for example. acts that inflict physical, mental or sexual harm or suffering, threats of such acts, coercion and deprivation of liberty).
8. Exploitation including sexual exploitation and abuse (for example, the prohibition of the exchange of money, employment, goods or services for sex, including sexual favors or other forms of humiliating, degrading behavior, exploitative behavior or abuse of power).
9. Protection of children (including prohibitions against sexual activity or abuse, or otherwise unacceptable behavior toward children, limiting interactions with children and ensuring their safety in project areas).
10. Sanitation requirements (for example, to ensure workers use specified sanitary facilities provided by the contractor(s) and not open areas).
11. Avoidance of conflicts of interest (such that benefits, contracts or employment, or any sort of preferential treatment or favors, are not provided to any person with whom there is a financial, family or personal connection).
12. Respecting reasonable work instructions (including regarding environmental and social norms).
13. Protection and proper use of property (for example, to prohibit theft, carelessness or waste)
14. Duty to report violations of this Code.
15. Non-retaliation against workers who report violations of the Code, if that report is

made in good faith.

The Code of Conduct shall be written in plain language and signed by each worker to indicate that they have:

- received a copy of the Code;
- had the Code explained to them;
- acknowledged that adherence to this Code of Conduct is a condition of employment; and
- understood that violations of the Code can result in serious consequences, up to and including dismissal, or referral to legal authorities.

A copy of the Code shall be displayed in a location easily accessible to the community and project affected people. It shall be provided in languages comprehensible to the local community, Contractor's Personnel, Employer's Personnel and affected persons.

MINIMUM REQUIREMENTS FOR THE TENDERER'S LABOR MANAGEMENT PLAN

As a minimum, the Labor Management Plan shall include the general as well as specific terms and conditions of employment, regulation of working hours, payment modalities, living conditions of the workers and a Grievance Redress Mechanism for resolution of labor related conflicts. This LMP shall be in accordance with the approved project LMP as well as other E&S instruments

PAYMENT FOR ESHS REQUIREMENTS

The Contractor shall be deemed to have included all costs associated with compliance with Environmental, Social, Health and Safety (ESHS) requirements in its overheads and spread across the rates and prices of all other Bill of Quantities (BOQ) items. No separate or additional payment shall be made for ESHS compliance. In the event of non-compliance with ESHS obligations, the Employer shall be entitled to withhold payments in accordance with Special Provision Clause 14.6.2.

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

This Environmental and Social Management Plan (ESMP) describes how the identified impacts and risks will be managed, with mitigation and enhancement measures as well as monitoring. Mitigation and enhancement measures are collated and expanded upon in the ESMP. The ESMP is organized by management plans, institutional setup, capacity building and training, and presents key monitoring and performance indicators.

For each topic, this ESMP identifies mitigation and enhancement measures. Where feasible, the mitigation hierarchy as per Environmental and Social Standard -1 (ESS1) of Environmental and Social Framework of AIIB are followed. The following sections present management measures and monitoring requirements for the impacts and risks, however, the details are provided in Environmental and Social Impact Assessment (ESIA) and other Environmental and Social Instruments prepared¹¹ as per the requirements of AIIB.

1.1 Contractors' Qualification

The Contractors procured under the Project be compliant with ISO 9001 Quality Management, ISO 14001 Environmental Management and ISO45001 Occupational Health and Safety Management or equivalent. In addition, all subcontractors under the major contractors will also be subject to ISO 14001 and ISO-45001 audit provisions by the main Contractor during the course of the project.

1.2 Various Mitigation and Control Measures

The ESMP includes different types of mitigation and control measures and sub-plans for significant impacts and risks: (i) general and non-site-specific measures in the form of Environmental and Social Codes of Practices (ECPs) presented in Annex 10-1 of ESIA to address general construction and operation matters identified as moderate and low in significance prior to mitigation and prevention in Table 8-2 of ESIA and Annex 9-1 of ESIA; (ii) project specific and to the extent possible, site-specific mitigation measures for substantial and higher impacts and risks are presented in Chapter 8 of ESIA; (iii) Contractor's ESMP (C-ESMP) with site-specific and contract-specific management plans to be prepared by the Contractor; (iv) Occupational and Community Health and Safety (OCHS) Management System Processes and Standard Operating Procedures to be prepared by the Contractors; and (v) proposed plans in this ESMP to address significant and cumulative impacts.

1.3 Environmental and Social Code of Practices for Construction

The environmental and social codes of practice (ECPs) are generic, non-site-specific guidelines for the construction phase. The ECPs consist of environmental and social management guidelines and OHS practices to be followed by the contractors for sustainable management of all environmental, social, health and safety issues. The ECPs are listed below and details are presented in Annex 10-1 of ESIA.

- ECP 1: Waste Management
- ECP 2: Fuels and Hazardous Goods Management
- ECP 3: Water Resources Management
- ECP 4: Drainage Management

¹¹ The ESIA and other E&S instruments are provided on NHA's Website (<https://nha.gov.pk/documents/topic/26544>) and AIIB's Website (<https://www.aiib.org/en/projects/details/2024/special-fund/reconstruction-of-national-highway-n-5-under-pakistans-resilient-recovery.html>)

- ECP 5: Soil Quality Management
- ECP 6: Erosion and Sediment Control
- ECP 7: Topsoil Management
- ECP 8: Topography and Landscaping
- ECP 9: Borrow Areas Development & Operation
- ECP 10: Air Quality Management
- ECP 11: Noise and Vibration Management
- ECP 12: Protection of Flora
- ECP 13: Protection of Fauna
- ECP 14: Road Transport and Road Traffic Management
- ECP 15: Construction Camp Management
- ECP 16: Cultural and Religious Issues
- ECP 17: Construction and Operation Phase Security

1.4 Contractor's Environmental and Social Management Plan

The Contractor will prepare a 'Contractor's Environment and Social Management Plan' (C-ESMP) demonstrating the manner in which they will comply with the requirements of Site-Specific Management Plans, ECPs and the mitigation measures proposed in this ESIA Report. The C-ESMP will be submitted before the start of any construction activities (within 28 days after signing of contract) of Contractor's mobilization and be approved by the Engineer. The C-ESMP will form the part of the contract documents and will be used as monitoring tool for compliance. Violation of the compliance requirements will be treated as non-compliance leading to the corrections or otherwise imposing penalty on the contractor.

1.5 Occupational and Community Health and Safety Management Plan

The Contractor will also prepare an Occupational and Community Health and Safety Management (OCHSM) plan devising the general guidelines for the identified hazards and control measures along with the OHS Management Processes and Standard Operating Procedures presented in Chapter 9 of ESIA. The OHS shall comply with ESS1, World Bank Group General Environmental Health and Safety Guidelines, Chapter 2 of ESIA: Occupational Health and Safety, 2007; Punjab Labour and OHS Acts; and ILO Code of Practices 1992, Safety and Health in Construction Industry; and Safety and Health in Building and Civil Engineering Work, ILO Codes of Practices. If the guidelines stated before cannot address a specific OCHS management in the project, Good International Industry Practices will be applied, as for example, OSHA and ISO45000.

Review and update of the OCHSM plan will be done,

- a) when there is a change in the scope of the project,
- b) there is a change in construction methodology/technique based on site condition,
- c) following significant OHS hazard or a major accident, and
- d) at the end of the Project (to allow for improvements in subsequent projects).

OCHS Plan should contain general guidance for all identified risks under each work activities. It also contains management system processes and standard operating practices. Processes and SOPs should be presented in three discrete headings, (a) Contractor's Standards on the identified risk management, (b) Expected Site specific OCHS hazard and risks during construction, and (c) Control Measures proposed by the Contractor.

1.6 Risk Assessment and Management

Risk assessment (RA) will be done by Contractor for each construction task focusing on job tasks as a way to identify risk before they occur, based on the guidance provided in Chapter 9 of ESIA. The outcome of the RA will be the risk register, which will focus on the relationship between the worker, the task, the tools, and the work environment. Ideally, after identifying uncontrolled hazards, steps should be taken to utilize hierarchy of control: elimination, substitution, engineering controls, administrative controls and personal protective equipment, to minimize them to an acceptable risk level. Many workers are injured and killed at the worksite every day. The RA should be one of the major components of the larger commitment of the Contractor's health and safety management system.

The RA should be conducted on many jobs in the worksite. Priority should be given to the following types of jobs:

- Jobs with the highest injury or illness rates;
- Jobs with the potential to cause severe or disabling injuries or illness, even if there is no history of previous accidents;
- Jobs in which one simple human error could lead to a severe accident or injury;
- Jobs that are new or complex to the construction or have undergone changes in construction processes and procedures; and
- Jobs complex enough to require written instructions.

1.6.1 EHS in Method Statement

The Contractor will include an EHS Chapter in each Method Statement. This EHS section will be based on the RA and other provisions of OCHS Plan and environmental issues of the site and specific to construction methods to be followed by the Contractor. This section will be reviewed by the EHS Specialists of the Engineer/Construction Supervision Consultant (CSC) and confer approval along with other technical parameters to be reviewed by the engineering team of the CSC. Each revision of the method statement shall also be reviewed by the EHS Specialists and their concurrence will be required to get the method statements approved.

1.6.2 Field Engineer's EHS Oversight

There will be limited supervision staffs available in EHS to cover all work sites and project shifts in the project. Therefore, it will become impossible to supervise and monitor EHS parameters in every site in a continuous basis. Hence, site engineers can be delegated certain EHS oversight. Engineers monitoring forms including Available for Inspection (AFI) and Daily Monitoring Forms (DMF) and checklists will be designed to include EHS aspects. EHS should be made also a key responsibility of site engineers.

Training program will be devised by CSC on engineers' oversight in EHS and will be offered by EHS specialists of the Contractor and CSC to address EHS immediately when identified and raise it to EHS specialists if further action is required. The training on engineers' oversight should convey the following messages:

- Engineers would assume greater responsibility for overseeing the EHS as part of their daily routine work,
- Engineers would review and approve each site's readiness to commence the work as per the design specifications, certifying whether Contractors are meeting the

requirements of the Method Statements, and withholding funds from them that are not complied with.

- Engineers would impose financial penalties on the Contractor with nonexistent or non-compliant EHS matters; and
- Engineers will assist workers in recognizing environment friendly and safe work measures and procedures necessary to protect the natural environment and occupational health and safety of workers and prevent illnesses, injuries and fatalities during construction.

1.6.3 Request for Inspection

Poor temporary structures such as scaffold, access walkways, stairs, and ladders are some of the major causes of the accidents in construction industry. For technical verifications of the temporary structures, specifications in the bidding documents define the material, stability, strength and deflections of each temporary structure. However, this clause is often ignored in construction industry as the main focus is the permanent structures. Therefore, Request for Inspection (RFI) or Availability for Inspection (AFI) for temporary structures will be required, as a pre-requisite for the readiness of site. Along with the technical requirements (e.g., complete drawings, calculations relating to stability, strength, and deflections), health and safety parameters will also be inspected for all temporary structures. During these RFI/AFI, both technical and EHS personnel of the CSC will inspect the requirements and certify the technical quality and the readiness of the site to commence the permanent work.

1.7 Inclusion of Relevant Components of ESMP in Contract Documents

The ESMP of the Project along with the ECPs and occupational hazards and risks will be included in the contractors' bid documents. The technical specifications of the bid documents will clearly state that contractor will need to comply with the mitigation and control measures provided in the ESMP, ECPs, OCHSMP, World Bank Group EHS General Guidelines and SEQs as well as other stringent quality standards.

1.7.1 Contractor's Obligations

- After the award of the contract and before mobilization, the Contractor will prepare and submit two separate plans, C-ESMP and OCHSMP in compliance with this ESIA, ESS2, WBG EHS Guidelines, ILO COPs, and SEQs. The preparation and their revisions and updates will also be quantified and presented as line items in the Contract.
- Quantities of personal protective equipment (PPE), first-aid boxes, ambulance, health care facility with Pakistan Medical and Dental Council licensed doctors and nurses.
- Provision of Environmental and OHS Staffs for the entire construction period. Detail staff requirements are presented in ESIA.
- Providing and maintenance of Dust Measurement Meters for spot measurements (2 number).
- Quarterly 24-hour Ambient Air Quality Monitoring of PM10, PM2.4, NO2, SO2, and CO.
- Continuous noise monitoring close proximity of settlements/sensitive receptor during the construction work.

1.8 Institutional Arrangements for Implementation of E&S Instruments during Construction Phase

The key players involved during construction phase of the proposed Project are the Project Implementation Unit (PIU) NHA as employer / proponent and Regional Implementation Unit (RIU) for section 2, Punjab EP&CCD, the Construction Supervision Consultants (CSC), Third Party Validation Consultant and the Contractor(s). The organizational setup for implementation of E&S instruments during construction phase is provided in **Figure 1.1**.

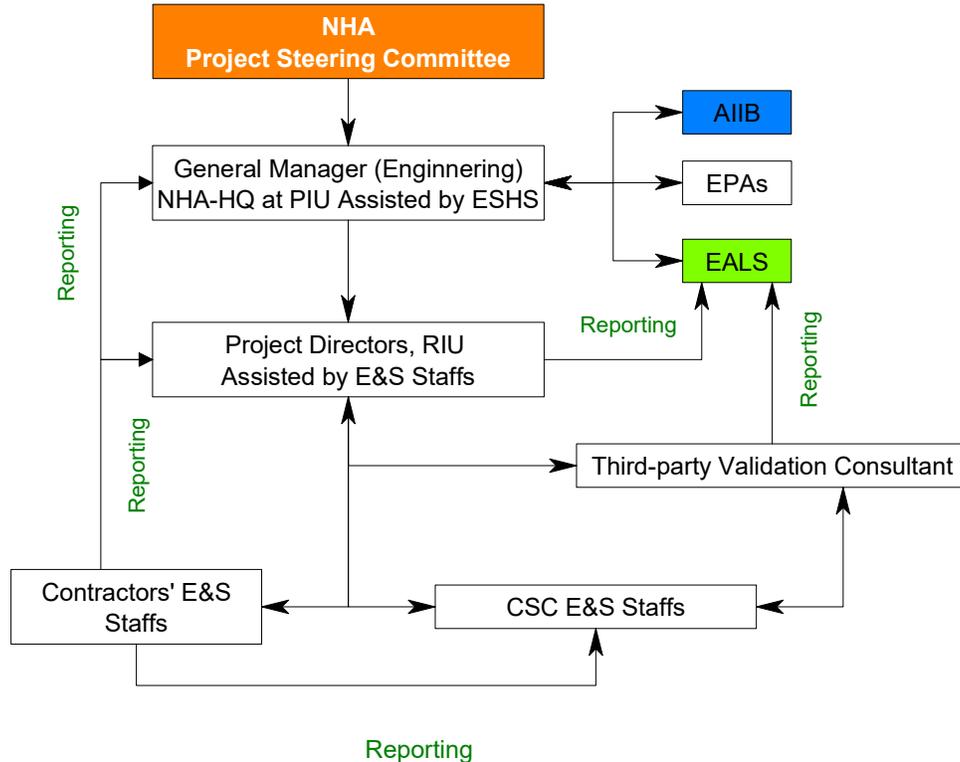


Figure-1: Organizational Setup for Implementation of E&S Instruments during Construction

Contractors will be responsible for the following:

- Preparation of C-ESMP with site specific mitigation plans for approval of CSC before mobilization.
- Preparation of Occupational and Community Health and Safety Management Plan based on construction methods, site specific hazards and guidance presented in Chapter 9 of ESIA.
- Implementation of C-ESMP and OCHSMP as well as mitigation, monitoring, and control measures proposed in the ESMP and OCHS Guidance.
- Prepare separate monthly reports for addressing environmental and social impacts and OCHS issues.

The following personnel are required in the contractor's environmental and social team:

- Lead EHS
- Environmental Specialist

- Social Specialist
- OHS Specialists (3 nos.)
- Community Liaison/Communication Officer
- EHS Supervisors (6 nos.)
- Flagman (25 nos.)
- Medical Doctor
- Medical Technicians (2 nos.)

The Contractor shall appoint one Lead EHS who shall be responsible for ensuring that the environment, health and Safety Management is adhered to the approved C-ESMP and OCHSMP. The EHS Manager shall be a graduate with at least a Bachelor Degree in OHS/engineering/ environmental management and have experiences of more than 15 years in environment, health and safety works in infrastructure construction. They will be suitably qualified and experienced persons acceptably fluent in the English language. They shall have obtained a vocational certification issued by NEBOSH (National Examination Board in Occupational Safety and Health), or Board of Canadian Registered Safety Professional or an equivalent certification. The Lead EHS or his designates (equally qualified) shall be available at Site and their deputies shall carry out regular and random checks of all parts of the Site where work is taking place.

1.9 Environmental and Social Management

1.9.1 Construction Stage Site Specific Management Plans

Contractor will be required to prepare site specific management plans and include in the C-ESMP along with the ECPs, prior to his mobilization and commencement of construction works, for approval of PIU and CSC. The key sub-plans are described below:

- **Material Transportation Plan** will be prepared by the contractor to prevent accidents during transportation by using motor-vehicles to the project sites and using other means. The plan should address specific details on the site conditions, the exact route to be followed and the conditions of the road. The Contractor propose alternative routes for review and approval by the Engineer. A commitment must be made by the Contractor to repair the road to its original condition, if any local road is damaged due to the heavy loaded traffic of the Project.
- **Pollution Prevention Plan** will be prepared as part of C-ESMP and implemented by the contractors on the basis of the ECPs and WBG EHS Guidelines that will be part of the bidding documents. The Plan will be submitted to the CSC for their review and approval before contractor mobilization.
- **Construction Camp Management Plan** will be prepared as part of C-ESMP by the contractor based on ECP 14. The Plan will include the camp layout, details of various facilities including supplies, storage, and disposal. The Plan will be submitted to the CSC for their review and approval before camp establishment.
- **Emergency Preparedness Plan** will be prepared by the contractor after assessing potential risks and hazards that could be encountered during construction.
- **Communication Plan** to deal with the interaction of the community, complaints management, workers recruitment, notice of works and workers conduct with locals.

1.9.2 Mitigation Plan

The mitigation, safety inspections, and audit plans are the key element of ESMP to be prepared on the basis of impact and risk assessment described in Chapter 8 of ESIA. The Plan describes the potentially negative impacts and risk during construction and operation, lists mitigation and prevention measures to address the negative impacts and risks, and assigns responsibilities for implementation, prevention and monitoring and inspecting of these measures. The Mitigation and prevention Plan is given in **Table 1**. Contractor will make sure they present the implementation status of mitigation and preventive measures identified in this Table in every monthly report, with quantifiable information.

Table 1: Mitigation, compensation, enhancement, and prevention plan

Impacts and Risks	Details of mitigation/enhancement measure	Implementation timing	Implementation method	Responsibility
ESS1: Assessment and Management of Environmental and Social Risks and Impacts				
<p>Inadequate implementation of C-ESMP, LMP, OCHSMP.</p>	<ul style="list-style-type: none"> • Recruit qualified contractors who maintains environmental sustainability in corporate strategy. • Avoid contractors with poor environmental, health, and safety management. • Contractor’s qualifications stated in the ESMP are included as the pre-qualification criteria in the short-listing process. • Ensure that the conditions of the ESMP is correctly reflected in the contractor’s bidding documents and the supervision consultant’s TOR. • EHS bills of quantities are included in the specifications. • Education, qualification and training requirements of personnel are included in the bidding documents and considered by the supervision consultant when they give approval to the contractor. • Prepare Contractor’s Environmental and Social Management Plan (C-ESMP), OCHSMP based on the ESIA. • Recruit qualified staffs to implement the C-ESMP and OCHSMP. 	<p>Planning prior to construction, implementation throughout. System review and re-planned for operations.</p>	<p>C-ESMP, LMP, OCHSMP.</p>	<p>Contractor, CSC, PIU, RIU</p>

Impacts and Risks	Details of mitigation/enhancement measure	Implementation timing	Implementation method	Responsibility
ESS1: Labor and Working Conditions				
Labor management,	<ul style="list-style-type: none"> Implement Labor Management Procedure (LMP) 	Planning prior to construction, implementation throughout. System review and re-planned for operations.	LMP; Stakeholder engagement with workers Worker representation committees Supply chain analysis and due diligence procedure	PIU, RIU, CSC, Contractor
Working condition	<ul style="list-style-type: none"> Mitigation measures include skill development, local employment, RIU-supervision for labor standards, worker training on GRM, a complaint box for reporting issues, and effective LMP compliance. 	Throughout project lifecycle	LMP	CSC, RIU Contractor
Worker accommodations	<ul style="list-style-type: none"> ECP 14: Construction Camp Management ensure that the Contractors are following the labor standards, training for the workers on the existing GRM so they know their rights and responsibilities, and availability of complaint box allowing for workers to report any wrongdoings. dedicated cleaning staff, routine checks of the conditions of the accommodations, penalties (to act as deterrent rather than with the intention for punishment) for workers are 	Throughout project lifecycle	Workers' accommodation plan and LMP	CSC, RIU Contractor

Impacts and Risks	Details of mitigation/enhancement measure	Implementation timing	Implementation method	Responsibility
	<p>careless and intentionally do not uphold the safety and hygiene standards.</p> <ul style="list-style-type: none"> Mitigation measures provided in LMP 			
Child and forced labor	<ul style="list-style-type: none"> Adding legal requirements in Contractor contracts that they must not employ underage workers, and positive identification before hiring. The contractor will comply with the labor laws of the Country. When sourcing for primary suppliers, the project will require such suppliers to identify the risk of child labor/forced labor and serious safety risks. The PIU and the consultants will review and approve the purchase of primary supplies from the suppliers following such risk identification/assessment. Where appropriate, the Project will be required to include specific requirements on child labor/forced labor and work safety issues in all purchase orders and contracts with primary suppliers. In particular, NHA will require bidders to provide two declarations: a Forced Labor Performance Declaration (which covers past performance), and a Forced Labor Declaration (which covers future commitments to prevent, 	Throughout project lifecycle	LMP	CSC, RIU, Contractor

Impacts and Risks	Details of mitigation/enhancement measure	Implementation timing	Implementation method	Responsibility
	<p>monitor and report on any forced labor, cascading the requirements to their own sub-contractors and suppliers).</p>			
<p>Risk of falling in water or drowning during bridge construction and maintenance over water</p>	<ul style="list-style-type: none"> Contractors will implement an OHS management plan with SOPs, job hazard analysis, method statements, training, and incident reporting. Work should be subcontracted to experienced firms, minimizing manual overwater tasks using mechanical equipment. Safety provisions include passive systems (fencing, guardrails, safety nets), worker rescue measures, safe transport, and mandatory life jackets. 	<p>Construction</p>	<p>OCHSMP</p>	<p>CSC, RIU Contractor</p>
<p>Occupational Health and safety</p>	<ul style="list-style-type: none"> Contractors will prepare and implement OHS management plan that would include standard operating procedures (SOPs) for all works, requirement of conducting Job Hazard Analysis and preparing Method Statements containing OHS aspects, traffic interface planning, working at height and hot work permit, barricading, OHS training requirements, incident recording and reporting protocols. NHA will prepare a similar Plan/System for the operation phase. 	<p>Throughout project lifecycle</p>	<p>OCHSMP</p>	<p>CSC, RIU, Contractor</p>

Impacts and Risks	Details of mitigation/enhancement measure	Implementation timing	Implementation method	Responsibility
Safeguarding personnel, property and the risks from presence of a security force	<ul style="list-style-type: none"> ECP 17: Construction and Operation Phase Security 	Planning prior to construction, implementation throughout.	Security management plan	RIU in collaboration as deemed relevant with a security service provider and Contractor
ESS1: Resource Efficiency and Pollution Prevention and Management				
Land use change	<ul style="list-style-type: none"> Mitigation measures would include proper land clearance planning, spoil management measures, vegetation clearance and erosion management, sediment management, design of storm water drainage in construction areas as well as design and implementation of site erosion control. 	Design and procurement period	Comply with design requirements	CSC, RIU, Contractor
Landscape aesthetic	<ul style="list-style-type: none"> Mitigation measures would involve careful siting of project components and improve landscape through plantations. 	Design and procurement period	Comply with design requirements	RIU, CSC, Contractor
Air pollution	<ul style="list-style-type: none"> Emissions management from construction vehicles, frequent spray of water on unpaved roads, and preventing the release of emission from burning waste materials. Dust control measures would consist of proper construction materials planning, dust management planning, and water spraying where needed. Prevent release of dust and emissions from burning waste materials, 	Throughout construction and operation	Air quality management plan	CSC, Contractor, RIU

Impacts and Risks	Details of mitigation/enhancement measure	Implementation timing	Implementation method	Responsibility
	<p>construction vehicles, and generators, and their management</p> <ul style="list-style-type: none"> • ECP 1: Waste Management • ECP 2: Fuels and Hazardous Goods Management • ECP 7: Topsoil Management • ECP 9: Air Quality Management • ECP 13: Road Transport and Road Traffic Management 			
Noise and vibration	<ul style="list-style-type: none"> • Noise and vibration management, organize the loading and unloading of trucks, and handling operations for the purpose of minimizing construction noise on the work site, use lower wattage flat lens fixtures that direct light down and reduce glare during the night, thus reducing light pollution. • Using noise control mechanisms (e.g., noise canopy over generators and compressors) • Avoiding/minimizing noisy works during the night time as far as possible • Maintaining community liaison • Using light diffusers where necessary • ECP 10: Noise and Vibration Management 	Throughout construction and operation	Noise and vibration management plan Air quality management plan	CSC, RIU, Contractor
Potential hazards caused by bitumen	<ul style="list-style-type: none"> • Spills and leaks will be contained through appropriate means such as 	Throughout construction and operation	OCHSMP	CSC, Contractor, RIU

Impacts and Risks	Details of mitigation/enhancement measure	Implementation timing	Implementation method	Responsibility
and other toxic chemicals	<p>bunding. Chemicals and oils will be stored on cemented platform and in a covered area with spill containment arrangements.</p> <ul style="list-style-type: none"> • A waste management plan will be developed to deal with the wastewater produced from construction sites and camps as well as a design for spillage control and wastewater treatment. • ECP 2: Fuels and Hazardous Goods Management 			
Spoil management measures	<ul style="list-style-type: none"> • ECP 1: Waste Management • ECP 7: Topsoil Management 	Prior to construction	Spoil management plan	CSC, Contractor
Pollution associated with borrow pits	<ul style="list-style-type: none"> • Obtain and verify permits for borrow pits, regulate excavation depth (1:4 slope), control soil erosion, prevent mosquito breeding, preserve topsoil for vegetation, use pits for waste disposal, and ensure safety with fencing and access restrictions. • ECP 9: Borrow Areas Development & Operation 	Throughout construction	Borrow material management	contractor RIU
Wastewater from construction camps and other site facilities	<ul style="list-style-type: none"> • Avoid storing liquids where there is a high risk of water pollution or land contamination (e.g., on bare ground or unsealed surfaces, next to drains, creeks etc.). • Proper waste disposal system is to be implemented to minimize pollution 	Prior to construction; During construction	Design Waste management plan	RIU, contractor and designers

Impacts and Risks	Details of mitigation/enhancement measure	Implementation timing	Implementation method	Responsibility
	<ul style="list-style-type: none"> • All fuel, oils, chemicals, hydraulic fluids, on-site toilets etc. must be stored in the construction site compound which shall be bunded • Optimize use of resources (oil, water, etc.) to minimize the amount needed • Make incidence reporting a priority in case of spills and leaks • Train staff to recognize spills and the appropriate measures to take • Keep continuous inspection for leaks prior to each construction activity (e.g., concrete pouring) • All pouring of concrete, sealing of joints, application of water-proofing paint or protective systems, curing agents, etc. for outfalls must be completed in dry weather • Locations where concrete or other wet materials are to be used, bunded steel decks must be used to capture any spilled concrete, alkaline water displaced from inside tubular steel piles or spilled sealants or other materials • The fueling equipment should be equipped with breakaway” hose connections that provide emergency shutdown of flow in case of failure of connection. 			

Impacts and Risks	Details of mitigation/enhancement measure	Implementation timing	Implementation method	Responsibility
	<ul style="list-style-type: none"> • Absorbents should be present at places of refueling. • All camps and other facilities will have appropriate effluent treatment and disposal mechanism • Regular monitoring of water quality near Project Area • ECP 1: Waste Management • ECP 3: Water Resources Management • ECP 14: Construction Camp Management 			
Storm-water in construction areas	<ul style="list-style-type: none"> • ECP 1: Waste Management • ECP 4: Drainage Management • ECP 3: Water Resources Management • ECP 14: Construction Camp Management 	Prior to construction	Design	RIU, contractor and designers
Site erosion	<ul style="list-style-type: none"> • ECP 5: Soil Quality Management • ECP 6: Erosion and Sediment Control • ECP 7: Topsoil Management 	Prior to construction Throughout construction period	Design Sedimentation and erosion control plan	RIU, contractor and designers
Leaks and spills	<ul style="list-style-type: none"> • ECP 1: Waste Management • ECP 2: Fuels and Hazardous Goods Management • ECP 3: Water Resources Management 	Design prior to construction. Throughout construction period.	Design Spill management plan Traffic management plan Water resources management plan Construction traffic management plan	RIU, contractor and designers
Safe drinking water	<ul style="list-style-type: none"> • ECP 3: Water Resources Management 	Throughout project	Water resources management plan	contractor; RIU

Impacts and Risks	Details of mitigation/enhancement measure	Implementation timing	Implementation method	Responsibility
Stockpiling arrangements and pollution prevention	<ul style="list-style-type: none"> • ECP 1: Waste Management • ECP 2: Fuels and Hazardous Goods Management • ECP 3: Water Resources Management • ECP 7: Topsoil Management 	Construction	Ecological management plan within the ESMMP spill management plan water resources management plan waste management plan	contractor
Solid waste management	<ul style="list-style-type: none"> • Implement waste management system to avoid, minimize, reduce and reuse waste including defining material ordering, use and handling measures. Moreover, waste material storage areas, borrow pits and materials laydown areas should be carefully designed and sited. Appropriate measures should also be introduced for materials storage, handling and use. • Introduce measures for waste segregation where applicable • Define storage and transportation requirements for various types of wastes • Define final disposal arrangement/location for various types of wastes • ECP 1: Waste Management • ECP 2: Fuels and Hazardous Goods Management 	Throughout construction and operations	Waste management plan	contractor

Impacts and Risks	Details of mitigation/enhancement measure	Implementation timing	Implementation method	Responsibility
Measures for materials storage, handling and use	<ul style="list-style-type: none"> ECP 1: Waste Management ECP 2: Fuels and Hazardous Goods Management 	Throughout construction and operations	Materials management plan	contractor
Re-use construction material	<ul style="list-style-type: none"> ECP 1: Waste Management 	During design and construction	Materials management plan	contractor
Traffic management including Speed restrictions; Vehicle monitoring; Trained drivers and licensed contractors, road maintenance; Designated crossing points; on site traffic management; Minimize vehicle journeys and fuel consumptions; and accident action planning	<ul style="list-style-type: none"> Mitigation measures include road condition surveys, controlling vehicle movement, final road routing, and ensuring proper road maintenance. The contractor will prepare and implement a traffic management plan that would include drivers' training in defensive driving techniques, speed control, placement of flagmen where needed (e.g., along the populated areas and markets), placement of sign boards, liaison with the community and increasing community awareness regarding project related traffic. ECP 13: Road Transport and Road Traffic Management 	Construction	Traffic management plan	contractor
Structural adaptation measures - Adding flexibility and low regret climate adaptation measures for dealing with floods, droughts, heatwave events	<ul style="list-style-type: none"> Locate camp on higher and stable ground Design access roads with consideration of flood and drought risks Provide shading, insulation and ventilation at work sites Locate transmission line towers and their foundations out of known flood 	Detailed design	Design	RIU and contractor

Impacts and Risks	Details of mitigation/enhancement measure	Implementation timing	Implementation method	Responsibility
	zones and avoiding steep slopes if possible <ul style="list-style-type: none"> • For transmission towers and their foundations, increase concrete mix/strength to be more resilient to flood, drought, heat and lightning strikes • Insulate and protect critical service infrastructure • Adapt traditional construction materials to withstand higher temperatures • Include debris screens for drainage systems, additional construction joints to allow for more thermal expansion, slope protection / stabilization measures and monitoring 			
Temporary flood reduction measures	<ul style="list-style-type: none"> • Store temporary flood barriers for deploying in a storm/heavy precipitation event. • Prepare temporary additional drainage and temporary debris screens • Plan for increased road drainage, and road surfacing on temporary/unsurfaced roads • Revise construction schedule during extreme flood event 	During construction	Climate risk management plan (following IHA Hydropower Sector Climate Resilience Guide 2019)	contractor
ESS1: Community Health and Safety				
Community Health and Safety Risks in the Communities	<ul style="list-style-type: none"> • Mitigation measures would include performing medical screening and 	Throughout project lifecycle	Community health and safety plan	RIU Contactors

Impacts and Risks	Details of mitigation/enhancement measure	Implementation timing	Implementation method	Responsibility
close Proximity of the Project; labor influx; SEA/SH risks	<p>requiring proof of vaccination prior to any employment. Moreover, the contractor should conduct induction training or workshops to introduce the basics of health and hygiene and the necessary preventive measures against them.</p> <ul style="list-style-type: none"> • Vaccination programs can also be organized in the camp and any positive cases of COVID-19 should be dealt with diligently. • Establish workers' camps separated from local communities with strict protocols for interaction with local communities in order to avoid project impacts from labor influx. • Contractor will develop a Code of Conduct (CoC) for all site personnel. All site personnel will sign this CoC and will abide by it. • Project staff will receive training on the prevention of SEA/SH. Engagement of skilled trainers to raise awareness among project workers of the risks, expected behaviors, and consequences of violations, communicated through training, and publicized codes of conduct. It may also be important to raise awareness of the risks among community members 			

Impacts and Risks	Details of mitigation/enhancement measure	Implementation timing	Implementation method	Responsibility
	<p>and local health authorities and inform them about available grievance mechanisms.</p> <ul style="list-style-type: none"> • Arrange and support local organizations and/or government initiatives on community STD education, prevention, and treatment programs. • Extensive training for awareness raising strategy which describes how workers and local communities will be sensitized to SEA and SH risks, and the worker’s responsibilities under the CoC • The routes/places used by the women will be avoided as far as possible. If unavoidable, alternate routes will be identified for the communities, if required, especially along routes frequented by women folk, such as route to the local well or water source. • Construction crew will avoid entering villages and settlements. • Communities will be informed and consulted before commencing works inside or near the communities. • Provision related to SEA/SH will be incorporated in the bidding document, 			

Impacts and Risks	Details of mitigation/enhancement measure	Implementation timing	Implementation method	Responsibility
	<ul style="list-style-type: none"> • Identification and mapping of the service providers. 			
Management of project-induced influx and local community effects from availability of short-term salaries	<ul style="list-style-type: none"> • Compile influx management strategies incorporated across the employment and procurement policy, stakeholder engagement plan, community health and safety plan, community investment plan and security plan into this plan. • Identify additional actions as required, for instance ring fence community investment funds for spatial planning or support for local initiatives to address greater demand for community and infrastructure, hold influx forum every year during construction, support counselling services in response to known anti-social behavior (including gender-based violence), and support financial management awareness services. 	Planning prior to construction, implementation throughout. Plan updated for operations if risk assessment indicates ongoing influx.	Influx management plan	RIU Contractor
Traffic Management; Traffic and Road Safety	<ul style="list-style-type: none"> • Mitigation measures include road condition surveys, controlling vehicle movement, final road routing, and ensuring proper road maintenance. • The Contractor will prepare and implement a traffic management plan based on the recommendations made by the road safety study (separately carried out for N5) that would include drivers' training in defensive driving 	Construction	Traffic management plan	contractor

Impacts and Risks	Details of mitigation/enhancement measure	Implementation timing	Implementation method	Responsibility
	<p>techniques, speed control, placement of flagmen where needed (e.g., along the populated areas and markets), placement of sign boards, liaison with the community and increasing community awareness regarding project related traffic.</p> <ul style="list-style-type: none"> • ECP 13: Road Transport and Road Traffic Management 			
Emergency Preparedness and Response	<ul style="list-style-type: none"> • Preparing an emergency preparedness and response plan (EPRP) by the Contractor at site level as part of the OCHSMP and by NHA at the Project level to contain larger emergencies. • NHA will work with the local authorities to coordinate with the national emergency response network in the areas of influence and to ensure implementation of the project specific emergencies and make arrangements with external emergency services (Fire, ambulance, etc.), if the resources available with the Contractor is not sufficient to contain an emergency. 	Design, pre-construction, construction, and throughout project lifecycle	Emergency Preparedness and Response Plan	RIU Contractor
ESS 1: Biodiversity, Conservation, and Sustainable Management of Living Natural Resources				
Losses of trees and terrestrial habitat due to land clearance	<ul style="list-style-type: none"> • Mitigation measures include minimizing land clearance, restricting activities to designated areas, and properly planning camps, machinery 	Operation	ESMP	RIU and Contractors

Impacts and Risks	Details of mitigation/enhancement measure	Implementation timing	Implementation method	Responsibility
	<p>movement, and temporary roads to protect vegetation.</p> <ul style="list-style-type: none"> • Construction camps should be established in areas with little to no vegetation, and alternate routes for access and diversion road should be chosen to avoid environmental impact. • Camp locations will be selected to minimize environmental effects, reduce costs, and limit land use. • Compensate each tree with 10 trees planted with a total of 25,450 saplings, through a plantation enhancement program. • ECP 5: Soil Quality Management • ECP 6: Erosion and Sediment Control • ECP 7: Topsoil Management • ECP 8: Topography and Landscaping • ECP 11: Protection of Flora • ECP 12: Protection of Fauna 			
Habitat rehabilitation and restoration	<ul style="list-style-type: none"> • Include habitat rehabilitation and restoration on the sites affected temporarily by construction (these are unknown at this stage). The nature and areas of habitats to be restored on these sites will be determined following stakeholder consultation led by the RIU. 	Implement immediately after construction	Ecological management plan within the ESMMP (Vegetation removal and restoration plan within this)	Led by RIU with contractor implementation support

Impacts and Risks	Details of mitigation/enhancement measure	Implementation timing	Implementation method	Responsibility
Killing or injury of species	<ul style="list-style-type: none"> introducing and enforcing speed limits for vehicles. A hunting ban imposed on Project staff alongside other standard mitigation for road safety and habitat clearance. ECP 11: Protection of Flora ECP 12: Protection of Fauna 	Throughout project lifecycle	Ecological management plan within the ESMP (Wildlife rescue and relocation plan within this)	contractor
ESS1: Stakeholder Engagement and Information Disclosure				
Stakeholder engagement carried out in a meaningful and inclusive way, providing access to remedy	<ul style="list-style-type: none"> Detailed measures available in Stakeholder Engagement Plan 	Stakeholder engagement plan (current version developed as part of this ESIA) Implementation prior to construction, during construction and operations	Stakeholder engagement framework in ESMS Stakeholder Engagement Plan	RIU, possibly with support of a communications company Contractor

1.10 Plans to Address Project Impacts and Risks

Five ESMP Sub-plans have been proposed to address direct project and cumulative impacts, to guide environmental and social management procedures and the implementation of prescribed mitigation and enhancement measures during the construction and operational phases of the Project. This section will be further updated when engineering design is finalized. The following sub-plans have been proposed under the Project to be implemented by the Contractor and RIU:

1.10.1 Tree Plantation / Reforestation Plan

The basic purpose of afforestation/plantation of suitable species in the Project area is to reduce the risk been made due to different construction activities for the proposed Project. The expected risk made will be compensated by planting of saplings to enhance green cover and improve the overall environment of the area. Afforestation will not only reduce the risk been made but will also increase the green cover, carrying capacity and aesthetics of the area along with many positive aspects and impacts.

Plantation will be done after the construction work immediately by contractor (other than civil work contractor). Plantation of indigenous trees species is highly important to maintain the biodiversity and ecological balance. 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 construction, the afforestation activity will further help in enhancing the socio-economic condition of the area and Project sustainability.

The Forestry and Wildlife Department, Punjab may be engaged for carrying out the proposed activates. The details are attached as Annex 10-2 of ESIA. Maintenance of the plantation will be responsibility of NHA Afforestation Department.

1.10.2 Project Induced Labor Influx Management Plan

The plan is to recruit one Contractor for the entire project and they may develop two construction facilities Section 2. The project expects to involve direct workers, contracted workers and primary supply workers. Most unskilled positions are likely to be sourced from the local districts and neighboring communities, thereby sharing project benefits with communities. Many of the workers are expected to be employed from the existing highway reconstruction projects, therefore, reducing new workers coming into the area.

The construction work, with the promise for more development in the project locations – particularly in selected central places/markets, may further attract diverse groups of in-migrants, namely, families/followers, traders/entrepreneur, small business/shop owners, suppliers of construction-related materials and various other service providers will move into the area to benefit from the project construction for more than two years period. This may lead to potential negative socio-cultural impacts, including a wide range of concerns such as gender-based violence, sexual exploitation and abuse of women/children, generating tensions between the local residents of the remote and isolated and rather conservative communities and the in-migrant groups.

The Contractor will prepare a labor influx management plan in line with AIB's guidelines, covering measures or strategies to (i) raise awareness and engage all stakeholders (e.g., project management, contractors, consultants, community groups/leaders, local NGOs) in responding to the social and cultural risks to local communities; (ii) inter-cultural understanding with a view to minimize the risks; (iii) better management of construction and labor camps; (iv) development and implementation of code of conduct for locals and in-migrant workers (for

instance, respect to local values and cultures; workers strictly forbidden to establish contacts and relationship with local women; workers must not leave camps without prior permission from the supervisors; and workers or local resident must report any suspicious contact or activities to the camp officers); and (v) improvement in local law and order to ensure positive environment and build a community of mutual trust and respect for project construction.

1.10.3 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 construction and to provide procedures to follow in the event of a chance archaeological find. The chance find procedure of archaeological deposits is attached as Annex 1 of the ESMPF.

1.10.4 Skill Development Plan for Employment with the Contractor

Due to the high unemployment rate in the country, communities who are affected by the Project due to the resettlement for project implementation will come to the Contractors and implementing agency with the demand to be employed in the Project, this was echoed during community consultation as well. Most of them are unskilled and has no experience in infrastructure project. Therefore, Contractor will be reluctant to employ them at the beginning in the construction activities. This can cause protest and agitations in the project area and often lead to Contractors' work stoppages and extreme delay in project implementation. One-week job specific skill development training should be provided with pay to the community members prior to their employment. Some training can be outsourced to the recognized national or provincial institutions. Certificates should be provided to the participants after completion of the training. The training should be hands-on and specific to the job, e.g., Truck and car driver, Catering staff, Cement finisher, Scaffolder, Security staff, Electrician, asphalt sprayer, etc. This will bring two prong benefits, one in the development of skills in the country and the second one in quick project implementation.

In addition to the job specific training, the Contractor will provide training in the following areas:

(a) Communication Skills

Communication forms the backbone of almost any construction project. Whether it is to present an idea to the supervisor or foreman, discuss an alternate plan when construction hits a snag, or even just request new supplies, communication is important to making sure the project stays on track. The Contractor will always prefer construction workers who already have this soft skill; therefore, a good communicator will pay off the construction site by this skill.

(b) Teamwork Skills

Construction workers have to work in teams. Teamwork skills help get the job done. Much like good communication skills keep everyone on the same page, good teamwork skills allow everyone to work together in a harmonious way. The job stays on track and will likely be finished sooner if everyone works together.

(c) Time Management Skills

Time management skills are incredibly important for construction workers in any number of roles. Construction work has deadlines to meet. Some tasks are time-sensitive (e.g., concrete creeping). Delays are very common on the sites of construction projects. Contractor needs

workers who can manage their time effectively. Contractor needs workers who know how to prioritize and reorganize their schedules when faced with unexpected delays.

(d) Technical Skills

Specific construction skills include manual and mechanical excavation, stone-laying, pouring cement, erecting and installing specific types of equipment. Contractors typically appreciate versatile workers who can take on additional tasks as needed. Construction tasks may include:

- | | |
|--|---|
| (i) Electrical | (vii) OSHA safety requirements |
| (ii) Framing | (viii) Erecting |
| (iii) Concrete | (ix) Crane and Rigging |
| (iv) Panel assembly work | (x) Operation of Construction equipment |
| (v) Environmental codes | (xi) Use of Power tools |
| (vi) Reading and interpreting drawings | |

(e) Occupational Health and Safety at Worksite

Construction industry comes next to agriculture and cotton industry in providing jobs in Pakistan; though it is the third largest source of livelihood, it is highly informal and unorganized, with unskilled and semi-skilled workers. These workers, mostly migrants, fall into the trap of contractors and middlemen and lose their jobs and a decent life. The only way to reconstruct their lives is by training them in functional skills and equipping them with safety and health information at the earliest. In fact, such intervention can be effectively carried out on the construction premises itself with bare minimum infrastructure.

The classroom training apart from technical aspects also has soft skill trainings focusing on the social and behavioral habits of the trainees, including health, sanitation and safety to bring significant improvements in their worldview and way of life. Such skill trainings will help construction worker to gain self-confidence. Once they undergo the trainings, raw/unskilled workers look forward to handling semi-skilled jobs and semi-skilled workers to jobs requiring skilled manpower. As a result, Wage Enhancement is almost assured for all of those undergoing such trainings. These trained workers can then pursue semi-skilled jobs in the middle-east.

1.11 Environmental and Social Monitoring

Environmental and Social 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 E&S preparation, pre-construction, construction and O&M. 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 will be compared with the guidelines; standards and pre-Project condition to investigate whether the ESIA/ESMP and its implementation are effective for the mitigation of impacts or not. The objectives of environmental and social monitoring plan during the pre-construction, construction and O&M phases will be as follows:

- Monitor the actual Project impacts on physical, ecological and socio-economic receptors;

- Recommend additional mitigation measures for any unforeseen impact or where the impact level exceeds the anticipated level in the ESIA/ESMP;
- Ensure compliance with legal and community obligations including safety during construction and O&M phases;
- Ensure the safe disposal of excess construction materials, solid waste, water and wastewater and gaseous emissions;
- Appraise the adequacy of the ESIA/ESMP 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 ESIA/ESMP and recommend improvements in ESIA/ESMP, if required; and
- Compile periodic incidents / accidents data to support analyses that will help to minimize future risks.

PIU and RIU of NHA will be responsible for all the monitoring activities (compliance monitoring and effect monitoring). All the findings and results in the form of monitoring report will be finally shared with respective EPA as well as AIB as per the reporting mechanism.

1.11.1 Compliance Monitoring

The compliance monitoring of the proposed Project activities is principally a tool to ensure that the environmental and social control measures identified are strictly adhered to during the Project execution. The compliance monitoring will be conducted by the E&S Staff of SC. Various aspects of the ESIA/ESMP compliance monitoring will be to:

- Systematically observe the activities undertaken by the contractor(s) or any other persons associated with the proposed Project;
- Verify that the activities are undertaken in compliance with the ESIA/ESMP;
- Document and communicate the observations to the CSC and E&S staff of RIU, so that any corrective measures, if required, can be taken in a timely manner;
- Maintain a record of all incidents of environmental and social significance and related actions and corrective measures;
- Maintain contact with the communities, solicit their views and concerns, and discuss them during the monthly meetings; and
- Prepare periodic reports of the environmental and social performance of proposed Project.

1.11.2 Effect Monitoring Strategy

The ESIA/ESMP anticipates the impacts of the proposed Project on the basis of information available at the time of conducting the assessment and the natural processes that link various environmental and social parameters. Based on assessment, mitigation measures are introduced such that the predicted residual effects do not exceed acceptable levels. Consequently, it is possible that even if the mitigation measures are implemented fully, the negative impacts of the Project could exceed predicted levels or acceptable limits. In order to address the above concerns, effects monitoring will be undertaken during the Project activities, with the overall objective of proper management of environmental and social risks and uncertainties. Broadly, effects monitoring has the following objectives:

- To verify that the impacts of the proposed Project are within acceptable limits, thus establishing credibility (public assurance);

- To immediately warn the PIU and RIU of unanticipated adverse impact or sudden changes in impact trends so that corrective actions can be undertaken, which may include modifications in the proposed activities, or the inclusion of modified or additional mitigation measures;
- To provide information to plan and control the timing, location, and level of certain Project activities so that the effects are minimized; and
- To facilitate research and development by documenting the effects of the proposed Project that can be used to validate impact-prediction techniques and provide a basis for more accurate predictions of future projects.

The contractor(s) is mainly responsible for effect monitoring, which is being supervised by the CSC and monitored by RIU at each site, and for the entire Project. The effect monitoring program has been designed carefully considering the identified impacts and some additions or deletions probably in frequency may be taken up in this program after learning lessons from one-year operation of the Project through Change Record Register. **Table -2** provides environmental and social effect monitoring schedule for pre-construction, construction and operations stages of the proposed Project.

Table -2: Monitoring Plan as per ESSs

SI	Parameters / Receptor	Monitoring Parameters / Performance Indicator	Location	Monitoring Mechanism	Monitoring and Reporting Frequency	Responsibility	
						Implementation	Monitoring
1.	Water Resources/ Water Quality	Monitoring of all parameters of effluent from construction sites as per stringent environmental quality standards.	<p>Proposed Project routes.</p> <ul style="list-style-type: none"> Major receptor, i.e., residential areas etc. within the RoW/Aol. However, estimated sampling points will be verified at construction stage. <p>Other proposed effluent discharge points are:</p> <ul style="list-style-type: none"> Contractors camps Concrete preparation plants Fuel (Petrol. Oil and Grease) products storages. 	<p>Visual checks of laboratory activities</p> <p>Discrete grab sampling and laboratory testing of water samples by Punjab EP@CCD approved Laboratory for monitoring.</p>	<ul style="list-style-type: none"> Once before the start of construction by activity monitors and reported; and On quarterly basis during the construction. Bi annual during O&M Phase 	<ul style="list-style-type: none"> Contractor during Pre-Construction and Construction Phase NHA during O&M Phase 	<ul style="list-style-type: none"> Compliance monitoring lies with CSC and RIU during Construction Phase NHA during O&M Phase

SI .	Parameters / Receptor	Monitoring Parameters / Performance Indicator	Location	Monitoring Mechanism	Monitoring and Reporting Frequency	Responsibility	
						Implementation	Monitoring
			<ul style="list-style-type: none"> Vehicle and machines repairing and servicing yards. 				
2.	Drinking Water	Monitoring of all parameters of drinking water as per stringent environmental quality standards.	<p>Proposed Project routes.</p> <ul style="list-style-type: none"> Major receptor i.e. construction site, camps area and nearby residential areas within the RoW/Aol. However, estimated sampling points will be verified at construction stage. 	<p>Visual checks and monitoring of laboratory activities</p> <p>Discrete grab sampling and laboratory testing of drinking water samples by Punjab EP&CCD approved Laboratory for monitoring.</p>	<ul style="list-style-type: none"> Once before the start of construction by activity monitors and reported; and On quarterly basis during the construction. Bi annual during O&M Phase 	<ul style="list-style-type: none"> Contractor during Pre-Construction and Construction Phase NHA during O&M Phase 	<ul style="list-style-type: none"> Compliance monitoring lies with CSC and RIU during Construction Phase NHA during O&M Phase
3.	Soil Contamination	Soil contamination, uncontrolled solid waste disposal	<p>Proposed Project routes.</p> <ul style="list-style-type: none"> Sites with severe 	Visual observations and checks of laboratory activities	<ul style="list-style-type: none"> Once before the start of construction by activity 	<ul style="list-style-type: none"> Contractor during Pre-Construction and 	<ul style="list-style-type: none"> Compliance monitoring lies with CSC and RIU during

SI	Parameters / Receptor	Monitoring Parameters / Performance Indicator	Location	Monitoring Mechanism	Monitoring and Reporting Frequency	Responsibility	
						Implementation	Monitoring
		activities at sites.	contamination Other proposed sampling sites are: <ul style="list-style-type: none"> • Construction Camp. • Equipment washing yards. • Spillage points of fuel, chemicals and lubricants. 	Sampling and laboratory testing for soil samples.	monitors and reported; and <ul style="list-style-type: none"> • On quarterly basis during the construction. • Bi annual during O&M Phase 	Construction Phase <ul style="list-style-type: none"> • NHA during O&M Phase 	Construction Phase <ul style="list-style-type: none"> • NHA during O&M Phase
4.	Land Resources	Land use change.	Proposed Project routes. <ul style="list-style-type: none"> • Sites with significant land use change. 	Random visits and visual observations of land use change.	<ul style="list-style-type: none"> • Once before the start of construction by activity monitors and reported; and • On quarterly basis during the construction. • Bi annual during O&M Phase 	<ul style="list-style-type: none"> • Contractor during Pre-Construction and Construction Phase • NHA during O&M Phase 	<ul style="list-style-type: none"> • Compliance monitoring lies with CSC and RIU during Construction Phase • NHA during O&M Phase

SI	Parameters / Receptor	Monitoring Parameters / Performance Indicator	Location	Monitoring Mechanism	Monitoring and Reporting Frequency	Responsibility	
						Implementation	Monitoring
5.	Dust Emissions	Monitoring of PM ₁₀ PM _{2.5} as per stringent environmental quality standards	Proposed Project routes. <ul style="list-style-type: none"> Sensitive receptors within the RoW/Aol, construction site, camps area. Estimated sampling points will be verified during construction stage. 	Visual checks and monitoring of laboratory activities Onsite Ambient Air Monitoring equipment	<ul style="list-style-type: none"> Once before the start of construction by activity monitors and reported; and On quarterly basis during the construction. Bi annual during O&M Phase 	<ul style="list-style-type: none"> Contractor during Pre-Construction and Construction Phase NHA during O&M Phase 	<ul style="list-style-type: none"> Compliance monitoring lies with CSC and RIU during Construction Phase NHA during O&M Phase
6.	Noise Pollution	Day and night time noise monitoring in dBA Leq. as per stringent environmental quality standards	Proposed Project routes. <ul style="list-style-type: none"> Sensitive receptors within the RoW/Aol. Estimated sampling points will be verified during construction stage. 	Visual checks and monitoring of laboratory activities Monitoring of noise level at site.	<ul style="list-style-type: none"> Once before the start of construction by activity monitors and reported; and On Monthly basis during the construction (spot measurement regular daily 	<ul style="list-style-type: none"> Contractor during Pre-Construction and Construction Phase NHA during O&M Phase 	<ul style="list-style-type: none"> Compliance monitoring lies with CSC and RIU during Construction Phase NHA during O&M Phase

SI	Parameters / Receptor	Monitoring Parameters / Performance Indicator	Location	Monitoring Mechanism	Monitoring and Reporting Frequency	Responsibility	
						Implementation	Monitoring
			Other proposed sampling sites are: <ul style="list-style-type: none"> • Construction camps. • Equipment yards. 		<p>basis keeping in view the day to day application of different heavy noise causing equipment by the contractor).</p> <ul style="list-style-type: none"> • Bi annual during O&M Phase 		
7.	Fumes and gases	<p>Monitoring of CO, CO₂, SO_x, NO_x, HC and PM_{2.5} and PM₁₀ and compliance with stringent environmental quality standards</p> <p>Vehicular emissions as per stringent environmental quality standards.</p>	<p>Proposed Project routes.</p> <ul style="list-style-type: none"> • Major receptors within the RoW/Aol. Estimated sampling points will be verified during construction stage. • Emissions from the silencers of 	<p>Visual checks and monitoring of laboratory activities</p> <p>Onsite monitoring of ambient air quality will be preferred.</p>	<ul style="list-style-type: none"> • Once before the start of construction by activity monitors and reported; and • On quarterly basis during the construction. • Bi annual during O&M Phase 	<ul style="list-style-type: none"> • Contractor during Pre-Construction and Construction Phase • NHA during O&M Phase 	<ul style="list-style-type: none"> • Compliance monitoring lies with CSC and RIU during Construction Phase • NHA during O&M Phase

SI	Parameters / Receptor	Monitoring Parameters / Performance Indicator	Location	Monitoring Mechanism	Monitoring and Reporting Frequency	Responsibility	
						Implementation	Monitoring
			heavy machinery, trucks and other vehicles.				
8.	Ecological Resources	Disturbance to natural habitat and fauna, uncontrolled floral cutting which can be avoidable.	Proposed Project routes along the RoW/Aol.	Visual checks to ensure that only marked trees are cut within the Project corridor. Monitoring of Wildlife / birds hunting. Inventory of existing trees, cut trees, and planted trees.	<ul style="list-style-type: none"> Once before the start of construction by activity monitors and reported; and On quarterly basis during the construction. Bi annual during O&M Phase 	<ul style="list-style-type: none"> Contractor during Pre-Construction and Construction Phase NHA during O&M Phase 	<ul style="list-style-type: none"> Compliance monitoring lies with CSC and RIU during Construction Phase NHA during O&M Phase
9.	Public Infrastructure	Disturbance or damage to public infrastructure	Proposed Project routes. <ul style="list-style-type: none"> Public infrastructures within the RoW/Aol. These structures will be verified prior to the 	Random visits and consultations with vulnerable.	Prior to the start of construction. Reporting will be done on the basis of RAP recommendation.	<ul style="list-style-type: none"> Contractor during Pre-Construction and Construction Phase NHA during O&M Phase 	<ul style="list-style-type: none"> Compliance monitoring lies with CSC and RIU during Construction Phase NHA during O&M Phase

SI	Parameters / Receptor	Monitoring Parameters / Performance Indicator	Location	Monitoring Mechanism	Monitoring and Reporting Frequency	Responsibility	
						Implementation	Monitoring
			start of construction.				
10.	Community around the Project corridor	Use of common resources. Hindrances to mobility. CHS	<ul style="list-style-type: none"> Communities within the RoW/Aol. 	Community consultations.	Prior to the start of construction and during the construction stage. Reporting will be done on the basis of RAP recommendation.	<ul style="list-style-type: none"> Contractor during Pre-Construction and Construction Phase NHA during O&M Phase 	<ul style="list-style-type: none"> Compliance monitoring lies with CSC and RIU during Construction Phase NHA during O&M Phase
11.	Waste Management	Inspection of waste and spoil disposal in accordance with Waste Management Plan	<ul style="list-style-type: none"> Main Project area (RoW) Construction camps and Offices. Equipment yards. Other Project allied facilities 	Visual Observations, Monitoring and Audits	<ul style="list-style-type: none"> Review the waste management stream before start of the Project; Monitoring and reporting on monthly basis during the construction stage; Bi-annual during O&M Phase 	<ul style="list-style-type: none"> Contractor during Pre-Construction and Construction Phase NHA during O&M Phase 	<ul style="list-style-type: none"> Compliance monitoring lies with CSC and RIU during Construction Phase NHA during O&M Phase

SI	Parameters / Receptor	Monitoring Parameters / Performance Indicator	Location	Monitoring Mechanism	Monitoring and Reporting Frequency	Responsibility	
						Implementation	Monitoring
12.	Labor Management and Working Conditions	As per the LMP of which include but not limited to OHS, hygiene facilities, appropriate camps area, etc.	<ul style="list-style-type: none"> Main Project area (RoW) Construction camps and Offices. Equipment yards. Other Project allied facilities 	Visual Observations, Incident/accident register Monitoring and Audits	<ul style="list-style-type: none"> Monitoring and reporting on monthly basis during the construction stage; Bi annual during O&M Phase 	<ul style="list-style-type: none"> Contractor during Pre-Construction and Construction Phase NHA during O&M Phase 	<ul style="list-style-type: none"> Compliance monitoring lies with CSC and RIU during Construction Phase NHA during O&M Phase
13.	Traffic Safety and Management	As per the TMP of ESIA / ESMP which include but not limited to the observation of traffic congestion at bottleneck areas, provision of signs and signal, vehicular inspection, driving safety protocols, etc.	<ul style="list-style-type: none"> Main Project area (RoW and Aol) Construction camps and Offices. Equipment yards. Other Project allied facilities 	Visual Observations, Vehicle Log Books, Monitoring and Audits	<ul style="list-style-type: none"> Monitoring and reporting on monthly basis during the construction stage. Bi annual during O&M Phase 	<ul style="list-style-type: none"> Contractor during Pre-Construction and Construction Phase NHA during O&M Phase 	<ul style="list-style-type: none"> Compliance monitoring lies with CSC and RIU during Construction Phase NHA during O&M Phase

SI	Parameters / Receptor	Monitoring Parameters / Performance Indicator	Location	Monitoring Mechanism	Monitoring and Reporting Frequency	Responsibility	
						Implementation	Monitoring
14.	Social aspects including GBV and other Grievances	Social and cultural conflicts, SEA/SH complaints, grievances related to livelihood impacts, child abuse, etc.	<ul style="list-style-type: none"> Main Project area (RoW and Aol) Construction camps and Offices. Equipment yards. Other Project allied facilities 	Visual Observations and consultations, Grievance Redress/Social Complaint Register, Monitoring and Audits	<ul style="list-style-type: none"> Monitoring and reporting on monthly basis during the construction stage; Bi annual during O&M Phase 	<ul style="list-style-type: none"> Contractor during Pre-Construction and Construction Phase NHA during O&M Phase 	<ul style="list-style-type: none"> Compliance monitoring lies with CSC and RIU during Construction Phase NHA during O&M Phase
15.	OHS, CHS, accidents and incidents	As per Chapter 9 of ESIA, OCHS which include but not limited to the unsafe acts and conditions, work permits, provision and availability of mandatory PPEs, Community complaints on OCHS, incidents and injuries, illnesses, trainings, TBTs, walk-	<ul style="list-style-type: none"> Main Project area (RoW and Aol) Construction camps and Offices. Equipment yards. Other Project allied facilities 	Visual Observations and consultations, Grievance Redress/Social Complaint Register, Incident/accident register, Monitoring and Audits	<ul style="list-style-type: none"> Monitoring and reporting on monthly basis during the construction stage Bi annual during O&M Phase 	<ul style="list-style-type: none"> Contractor during Pre-Construction and Construction Phase NHA during O&M Phase 	<ul style="list-style-type: none"> Compliance monitoring lies with CSC and RIU during Construction Phase NHA during O&M Phase

SI	Parameters / Receptor	Monitoring Parameters / Performance Indicator	Location	Monitoring Mechanism	Monitoring and Reporting Frequency	Responsibility	
						Implementation	Monitoring
		through-inspections, etc.					
16.	Chemical Storage and Handling	Safety Data Sheets, Leakage and spills, Segregated handling and storage of chemicals, availability of fire extinguishers.	<ul style="list-style-type: none"> Main Project area (RoW and Aol) Construction camps Equipment yards. Other Project allied facilities 	Visual Observations, Chemical Storage inventory, Incident/accident register, Monitoring and Audits	<ul style="list-style-type: none"> Monitoring and reporting on monthly basis during the construction stage Bi annual during O&M Phase 	<ul style="list-style-type: none"> Contractor during Pre-Construction and Construction Phase NHA during O&M Phase 	<ul style="list-style-type: none"> Compliance monitoring lies with CSC and RIU during Construction Phase NHA during O&M Phase
17.	Land Acquisition and Resettlement	As per Entitlement Matrix of RPF and RAP	<ul style="list-style-type: none"> Within the proposed project construction limits 	As per RAP	<ul style="list-style-type: none"> As defined in RAP 	<ul style="list-style-type: none"> NHA 	<ul style="list-style-type: none"> TPV (External Monitor)

1.12 Grievance Redress Mechanism

NHA will establish a Grievance Redress Mechanism (GRM) to effectively address community complaints and grievances. The GRM for this project will follow a three-tiered structure:

- Community/Local Level Grievance Redress Committee (GRC)
- Regional Implementation Unit (RIU) Level GRC
- Project Management Unit (PIU-NHA) Level GRC

In addition to these GRCs, Gender-Based Violence (GBV) Committees will be established and formally notified within the PIU/RIU to handle issues related to GBV, Sexual Exploitation and Abuse, and Sexual Harassment (SEA&SH). These committees will be gender-sensitive, ensuring that women can safely register grievances related to compensation, movement restrictions during construction, privacy concerns, GBV, or other project-related issues. The committee will facilitate and support affected women in lodging complaints and ensuring resolution.

For project workers, the PIU-NHA, supervision consultants, and contractors will establish a separate GRM (or integrate provisions into the overall GRM) to address labor and workplace-related concerns in compliance with national and provincial laws and Asian Infrastructure Investment Bank (AIIB) Environmental and Social Framework (ESF) requirements before the project becomes effective.

Detailed functions and responsibilities of each GRC, GBV Committee, and Worker GRM are outlined in the Stakeholder Engagement Plan (SEP) of this project.

1.13 ESMP Trainings

It is proposed that training programs be implemented during the Project life cycle to ensure all staff receive the required training in both general and job-specific issues. Trainings should be provided to all new recruits and continual refresher courses should be established for the existing staff. The implementation of the E&S training would help ensure that the requirements of the ESIA and ESMP are transparent to all project personnel and they are followed accordingly throughout the project lifespan. Moreover, the training programs would also ensure that all site personnel are well aware of their work responsibilities for instance, the environmental and social requirements of the Project and how they will be implemented and monitored on site. They will also be introduced to the potential impacts and risks of the Project, including the mitigation and control measures that have adopted to address those impacts and risks as well as where to implement the appropriate measures. Additionally, the trainings would lead the staffs to be well aware about the roles of NHA, the Engineer and the Contractor when it comes to environmental and social issues. Each organization will be responsible to provide training to their own staffs before the start of the Project and also during the execution of the Project. Training will cover all staff levels, including management, supervisory personnel as well as both skilled and unskilled workforces.

Training program will consist of the following:

- General E&S awareness or toolbox talks, induction, and community interaction.
- Discussion regarding the ESMP, E&S sensitivity of the project area and key findings of the ESIA.
- Awareness of transmissible diseases and will be scheduled before the start of any field activities.
- The trainings conducted by the Contractor for the construction staff would educate them about the ESMP and waste disposal and would similarly start before any construction activities.

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- The drivers would be trained prior to and during the field operations regarding road safety, defensive driving, waste disposal and cultural values and social sensitivity.
 - All site personnel would be educated about camp operation, waste disposal, natural resource conservation and housekeeping through trainings and they would commence prior to any field operations and would be continued throughout.
 - Special training will be organized for the Contractors' staff on near and over water construction.
 - Contractor staffs will be trained on job-specific work prior to commence the task, proper use of personal protective equipment.
 - Employees working under the Contractor would be trained about restoration requirements and waste disposal and the training program would commence before any restoration activities.
 - PIU will engage a third party to train NHA operation staff on how to clean the panels.

1.14 Reporting and Documentation

Contractor will prepare two separate monthly reports, one for Environmental and Social Management and the second one for OHS Management. The ESHS Section with assistance from CSC and contractors will also produce quarterly reports.

Incident Report: Contractors should present all incident information in the monthly report including property and environmental damages. For fatal and high potential incidents, a flash report must be submitted within 24 hours to the PIU and a detail investigation report within 7 days of the incident. All fatal incidents and high potential incidents require a root-cause analysis.

Contractor and CSC Monthly Report: Implementation schedule of the mitigation plans and safety inspections and preventive controls suggested in the ESMP should be reported in all monthly reports. The outcome of the field inspections and audits should be reported in all monthly report. Contractors should present the implementation schedule of mitigation measures and preventive actions in all monthly report along with monitoring and auditing and CSC should confirm the status of mitigation and preventive measures claimed by the Contractor.

Quarterly Progress Reports on Environment, Health and Safety: The environmental, Social, Health and Safety monitoring reports will include environmental and social mitigation measures and preventive actions undertaken, environmental and social monitoring activities conducted, details of monitoring data collected, analysis of monitoring results particularly the non-compliances, proposed mitigation and corrective measures, GRM data, ESHS training conducted, and environmental and OHS regulatory violations observed. The monitoring reports will be prepared by CSC and submitted quarterly during the construction period and annually for three years after completion of construction to EPA by ESHS Section/PIU.

Project Completion Environmental, Health and Safety Monitoring Report: One year after completion of construction, the ESHS Section will submit a Project Completion Environmental Monitoring Report which will summarize the overall environmental and social impacts and risks from the project.

Drawings

The actual Drawings, including site plans are annexed in a separate folder (As Volume-IV).

Supplementary Information

NIL

Section 8: General Conditions of Contract (GCC)

The Conditions of Contract consists of two parts, this Section 8 (General Conditions of Contract) and the following Section 9 (Particular Conditions of Contract).

Red Book:

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The Conditions of Contract are the “General Conditions” which form part of the “Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer (Red book)” Second edition 2017, reprinted 2022 with amendments” published by the Federation Internationale Des Ingenieurs – Conseils (FIDIC) and the following “Particular Conditions” which comprise of the Bank’s COPA and the amendments and additions to such General Conditions.

An original copy of the above FIDIC publication i.e. “*Conditions of Contract for Building and Engineering Works Designed by the Employer*” must be obtained from FIDIC.

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Section 9: Particular Conditions of Contract

The following Particular Conditions of Contract (PCC) shall supplement the GCC. Whenever there is a conflict, the provisions herein shall prevail over those in the GCC.

The PCC consists of four parts:

- Part A – Contract Data.
- Part B – Specific Provisions.
- Part C – Prohibited Practices.
- Part D – Environmental, Social, Health and Safety (ESHS) Metrics for Progress Reports.

The references to Clauses and Sub-Clauses provided in the PCC given below are applicable to the General Conditions of the “Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer (“Red book”), Second Edition 2017, reprinted 2022 with amendments” published by the Federation Internationale Des Ingenieurs – Conseils (FIDIC).

Particular Conditions of Contract (PCC) Part A - Contract Data

Ref. Sub- Clause (Col 1)	Conditions (Col 2)	Data (Col 3)
1.1.20 Percentage of Profit	Where the Contract allows for Cost Plus Profit, percentage profit to be added to the Cost	Five Percent (5%)
1.1.27	Defects Notification Period	365 days
1.1.31	Employer's name and address	Chief Executive Officer (CEO), National Highway Authority, 28-Mauve Area, G-9/1, Islamabad Member (Aided Projects) NHA will act as Employer on behalf of CEO NHA, for all purposes under this contract as his authorized representative.
1.1.35	Engineer's name and address	Name of The Engineer will be communicated before commencement of work.
1.1.73	Sections	Not Applicable.
1.1.84	Time for Completion	730 days
1.1.89	Bank's name	Asian Infrastructure Investment Bank
1.1.90	Borrower's name	Islamic Republic of Pakistan
1.3 (a) (ii)	Electronic transmission system	Facsimile and Email
1.3(d)	Address of Employer for communications:	Chief Executive Officer (CEO), National Highway Authority 28-Mauve Area, G-9/1, Islamabad, Pakistan
1.3(d)	Address of Engineer for communications:	Employer will notify before commencement of work
1.3(d)	Address of Contractor for communications:	To be determined later, once Tendering completed and contract awarded
1.4	Governing Law	Law of Islamic Republic of Pakistan
1.4	Ruling language	English
1.4	Language for communications	English
1.6	Time for the Parties to sign a Contract Agreement	Within 28 days after receipt of Letter of Acceptance and the furnishing of the Performance Security by the Contractor pursuant to Sub-Clause 4.2.
1.8	Number of additional paper copies of Contractor's Documents	Six (6) copies
1.15	Total liability of the Contractor to the Employer under or in connection with the Contract	The product of 1.15 times the Accepted Contract Amount

Ref. Sub- Clause (Col 1)	Conditions (Col 2)	Data (Col 3)
2.1	Time for access to the Site	<p>The Employer shall give the Contractor right of access to, and possession of, the Site in parts in accordance with a section-wise handing-over plan. Complete possession of, and full access to, the entire Site shall be provided within Six (6) months from the Commencement Date.</p> <p>The Section wise handing-over plan shall be notified to the successful bidder and the Contractor shall carry out the Works in compliance with such plan, without any adjustment to the Time for Completion and submit the Programme under GC Clause 8.1 accordingly.</p>
3.2	Engineer's Duties and Authority	<p>A Variation resulting in an increase of the Accepted Contract Amount in excess of 0.1% shall require prior consent of the Employer.</p> <p>Similarly, when cumulative of all Variations results in an increase of the Accepted Contract Amount in excess of 1%, any further Variation shall require prior consent of the Employer.</p>
4.2	Performance Security	<p>The Performance Security will be in the form of an Unconditional Bank Guarantee issued by a Scheduled Bank in Pakistan in the amount(s) of Ten percent (10%) of the Accepted Contract Amount and in the same currency (ies) of the Accepted Contract Amount.</p> <p>In case of Foreign Bank, the guarantee should be counter guaranteed by a scheduled Bank in Pakistan.</p>
4.7.2 (a)	Period for notification of errors in the items of reference	28 days.
4.19	Period of payment for temporary utilities	Each month
4.20	Number of additional paper copies of progress reports	Six (06) copies.
5.1(a)	Maximum allowable accumulated value of work subcontracted (as a percentage of the Accepted Contract Amount)	Fifteen Percent (15%)
5.1(b)	Parts of the Works for which subcontracting is not permitted	Not Applicable.
6.5	Normal working hours	<p>8:00 AM to 5:00 PM inclusive of one hour break or as specified by the Engineer.</p> <p>The Contractor shall have the option to work continuously in multiple shifts by day and night. However, the Contractor shall at its own cost provide and maintain such good and sufficient light as will enable to proceed the work satisfactorily and in a safe manner without</p>

Ref. Sub- Clause (Col 1)	Conditions (Col 2)	Data (Col 3)
		<p>danger. In such scenario, the Contractor shall take the Engineer's prior approval on the lighting arrangement, safety aspects and schedule of its work shifts.</p> <p>The working hours specified under this section shall at all times comply with the relevant provisions of the governing law.</p>
8.3	Number of additional paper copies of program	Six (06) copies.
8.8	Delay damages payable for each day of delay	0.05% of the Contract Price per day, in the currencies and proportions in which the Contract Price is payable.
8.8	Maximum amount of delay damages	Ten Percent (10%) of the Contract Price, less provisional sum for DAAB. .
12.2	Method of measurement	<p>It shall be in accordance with the Bill of Quantities, other applicable Schedule(s), or other relevant provisions of the Contract.</p> <p>In case of any inconsistency among various documents, Sub-Clause 1.5 [Priority of Documents] shall be followed.</p> <p>In case the method of measurement is not specified anywhere for any specific item of work, the Engineer shall specify an appropriate method of measurement based on recommended engineering practice.</p>
12.3	Percentage profit	As stated under 1.1.20 above.
13.4 (b)(ii)	Percentage rate to be applied to Provisional Sums for overhead charges and profit	Twenty Percent (20%) that includes profit, overhead and all the applicable taxes as per the Contract, except for DAAB fee.
14.2	Total Advance Payment	10% Percentage of the Accepted Contract Amount less provisional sums payable in the currencies and proportions in which the Accepted Contract Amount is payable on submission of unconditional Bank Guarantee on the prescribed form from a scheduled Bank in Pakistan. In case of Foreign Bank, the guarantee should be counter guaranteed by a scheduled Bank in Pakistan. The Contractor shall furnish acceptable Bank Guarantee within twenty eight (28) days of signing of the Contract.
14.2.3	Repayment of Advance payment	<p>(a) exceeds 30% of the portion of the Accepted Contract Amount payable in that currency less Provisional Sums; and</p> <p>(b) deductions shall be made at the amortization rate of 25%; provided that the advance payment shall be completely repaid prior to the time when 90 percent (90%) of the Accepted</p>

Ref. Sub- Clause (Col 1)	Conditions (Col 2)	Data (Col 3)
		Contract Amount Less Provisional Sums has been certified for payment.
14.3	Period of payment	After the end of each month
14.3(b)	Number of additional paper copies of Statements	Six (6) copies
14.3(iii)	Percentage of retention	Five Percent (5%)
14.3(iii)	Limit of Retention Money (as a percentage of Accepted Contract Amount)	Five Percent (5%)
14.5(b)(i)	Plant and Materials	Plant and Materials for Payment when shipped: Not Applicable
14.5(c)(i)	Plant and Materials	Plant and materials for payment when delivered to the Site: Steel Reinforcement (Grade 60). Asphalt Cement (Grades 60-70 and 80-100) only if stored in sealed drums. Cement (OPC).
14.6.2	Minimum Amount of Interim Payment Certificates	Two Percent (2%) of the Accepted Contract Amount less provisional sum
14.7(a)	Period of payment of Advance Payment to the Contractor	Twenty-eight (28) days
14.7b(i)	Period for the Employer to make interim payments to the Contractor under Sub-Clause 14.6 (Interim Payment)	Fifty-six (56) days
14.7b(ii)	Period for the Employer to make the Final Payment to the Contractor under Sub-Clause 14.13	Twenty-eight (28) days
14.7(c)	Period for the Employer to make final payment to the Contractor	Fifty-six (56) days
14.8	Financing charges for delayed payment (percentage points above the average bank short-term lending rate as referred to under sub-paragraph (a))	For local component, the financing charges shall be calculated at the annual rate of one percent above the Karachi Interbank Offered Rate (1%+KIBOR) notified by the State Bank of Pakistan. Online Source: https://www.sbp.org.pk/ecodata/kibor_index.asp For foreign component, the financing charges shall be calculated at the 30 day Average rate of SOFR (Secured Overnight Financing Rate). Online Source : https://www.newyorkfed.org/markets/reference-rates/sofr
14.11.1(b)	Number of additional paper copies of draft Final Statement	Six (6) copies

Ref. Sub- Clause (Col 1)	Conditions (Col 2)	Data (Col 3)
17.2(d)	Forces of nature, the risks of which are allocated to the Contractor	Any operation of all the forces of nature which is foreseeable and/or against which an experienced contractor could reasonably have been expected to have taken adequate preventive precautions.
19.1	Permitted deductible limits.	PKR 10.0 million or US \$ 35,500/- The Contractor shall submit the draft of the Insurance Policies before the Signing of the Contract for the Employer's approval and further details of issuance company rating from PACRA. The Insurance Company should have at least AA+ rating as determined by the Pakistan Credit Rating Agency - PACRA
19.2.1(b)	Additional amount to be insured (as a percentage of the replacement value, if less or more than 15%)	Fifteen Percent (15%)
19.2.1(iv)	List of Exceptional Risks which shall not be excluded from the insurance cover for the Works	Nil
19.2.2	Extent of insurance required for Goods	For their full replacement value including delivery to the Site
	Amount of insurance required for Goods	Full replacement cost including delivery to the Site
19.2.3(a)	Amount of insurance required for liability for breach of professional duty	1.15 times the work designed by the Contractor
19.2.3(b)	Insurance required against liability for fitness for purpose	Yes (in respect of the Contractor's design obligations only)
19.2.3	Period of insurance required for liability for breach of professional duty	Until the End of Defects Notification Period.
19.2.4	Amount of insurance required for injury to persons and damage to property	Minimum amount of third-party insurance(s): <ul style="list-style-type: none"> - PKR 7 million per occurrence in case of injury to persons, - PKR 10 million per occurrence in case of an injury to persons leading to a long-term disability, - PKR 15 million per occurrence in case of an injury to persons leading to a permanent disability, - PKR 20 million per occurrence in case of death, and - 1% of the Accepted Contract Amount, per occurrence in case of damage to property. Number of occurrences: Unlimited, till the issuance of Performance Certificate.

Ref. Sub- Clause (Col 1)	Conditions (Col 2)	Data (Col 3)
19.2.6	Other insurances required by Laws and by local practice (give details)	As per applicable law
21.1	Time for appointment of Dispute Avoidance/Adjudication Board (DAAB) member (s)	42 days after the Commencement Date
21.1	The DAAB shall be comprised of	Three (3) Members
21.1	List of proposed members of DAAB	Proposed by Employer The names of proposed members will be communicated 56 days after the commencement date Proposed by Contractor 1. _____ 2. _____ 3. _____ To be provided by the Tenderer at the time of Tender submission. (Attach CV to the Tender)
21.2	Appointment (if not agreed) to be made by	In case of local bidder, it shall be selected from Pakistan Engineering council (PEC) Arbitrator list on which parties agreed upon or by PEC. Further, for foreign bidder or JV, International Chamber of Commerce.
21.6 (a)	Rules of arbitration	Sub-Clause 21.6(a) of PART B – Specific Provisions shall apply.
21.6 (a)(ii)	Number of arbitrators	One (01) Sole Arbitrator.
21.6 (a)(iii)	Place of arbitration	In case of foreign contractor, the place of arbitration shall be neutral place/mutually agreed upon by both contracting parties, which shall neither be in the Employer's country nor in the foreign contractor's country. In case of domestic Contractor, place of arbitration shall be Islamabad, Pakistan.
21.6(b)		Sub-Clause 21.6(b) of PART B – Specific Provisions shall apply. Arbitration Act, 1940 (Act No. X of 1940) of Pakistan (as amended, modified, re-enacted or replaced thereof and in force on the date of the submission of the request for arbitration).

Particular Conditions of Contract (PCC)

Part B – Specific Provisions

Clause/Sub-Clause	Specific provisions
Sub-Clause 1.1.10 Contract	“the Contractor’s Proposal” is deleted.
Sub-Clause 1.1.49 Laws	The Sub-Clause is replaced with: “ Laws ” means all national (or state) legislation, statutes, ordinances and other laws, and regulations and by-laws of any legally constituted public authority.”
Sub-Clause 1.1.74 Site	The Sub-Clause is replaced with: “Site” means the places where the Permanent Works are to be executed, including storage and working area, and to which Plant and Materials are to be delivered, and any other places specified in the Contract as forming part of the Site.”
Sub-Clause 1.1.76 Specification	The following is added to the definition. The Specification includes Environment, Health and Safety Management Plan; Key Personnel requirement; and Equipment requirements.
Sub-Clause 1.1.77 Statement	On the second line after “Payment Certificate under...”, add “Sub-Clause 14.2.1 [Advance Payment Guarantee] (if applicable),”.
Sub-Clause 1.1.81 Tender	“the Contractor’s Proposal” is deleted.
New Sub-Clause 1.1.89 Bank	“Bank” means the financing institution (if any) named in the Contract Data
New Sub-Clause 1.1.90 Borrower	“Borrower” or “Recipient” means the person (if any) named as the borrower/recipient in the Contract Data
Sub-Clause 1.1.91 ESHS	“ ESHS ” means Environmental, Social, Health and Safety.
Sub-Clause 1.1.92 Sexual Exploitation and Abuse (SEA)	“Sexual Exploitation and Abuse” “(SEA)” stands for the following: Sexual exploitation is defined as any actual or attempted abuse of position of vulnerability, differential power or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another. In Bank-financed operations/projects, sexual exploitation occurs when access to or benefit from a Bank-financed Goods, Works, Non-consulting Services or Consulting Services is used to extract sexual gain. Sexual abuse is defined as sexual activity with another person who does not consent. It is a violation of bodily integrity and sexual autonomy and is

Clause/Sub-Clause	Specific provisions
	broader than narrower conceptions of “rape,” especially because (a) it may be committed by other means than force or violence, and (b) it does not necessarily entail penetration.
Sub-Clause 1.2 Interpretation	<p>Sub-paragraph (a) is replaced with the following: “Words indicating one gender include all genders; “he/she” is replaced with: “it”; “him/her” is replaced with “it”; “his” and “his/her” are replaced with: “its”; “himself/herself” are replaced with: “itself”.</p> <p>Further, “and” is deleted from the end of sub-paragraph (i) and added at the end of sub-paragraph (j). sub-paragraph (k) is added:</p> <p>(k) “The word “tender” is synonymous with “bid” or “proposal”, the word tenderer with “bidder” or “proposer” and the words “tender documents” with “request for bids documents” or “request for proposal documents”, as applicable.”</p>
Sub-Clause 1.5 Priority Documents of	<p>Delete sub-paragraphs from (a) to (k) and replace with the following;</p> <p>(a) the Contract Agreement; (b) the Letter of Acceptance; (c) the Letter of Tender; (d) the Particular Conditions Part A – Contract Data; (e) the Particular Conditions Part B – Specific provisions; (f) the Particular Conditions Part C – Prohibited Practices; (g) the Particular Conditions Part D - Environmental, Social, Health and Safety (ESHS) Metrics for Progress Reports; (h) List of Eligible Countries as defined by the Bank. (i) these General Conditions. (j) the Specification including EMP, ESHS, personnel and equipment requirements. (k) the Drawings. (l) Completed Schedules including Bill of Quantities. (m) Environment, Health and Safety Code of Conduct for Contractor’s Personnel. (n) Environment, Health and Safety Management Plan (ESHSMP). (o) the executed Joint Venture Agreement (if the Contractor is a Joint Venture); (p) Land Acquisition and Resettlement Plan (LARP); and (q) any other documents forming part of the Contract.</p>
Sub-Clause 1.6	The last paragraph is replaced with:

Contract Agreement	“If the Contractor comprises a Joint Venture, the authorized representative of the Joint Venture shall sign the Contract Agreement in accordance with Sub-Clause 1.14 [Joint and Several Liability].”
Sub-Clause 1.12 Confidentiality	<p>The following is added at the end of the second paragraph: “The Contractor shall however be permitted to disclose such particulars if required to establish its qualifications to compete for other projects.”</p> <p>“or” at the end of (b) is deleted.</p> <p>“or” at the end of (c) is added.</p> <p>The following is then added as (d): “is required to be provided to the Bank.”</p>
New Sub-Clause 1.17 Inspections & Audit by the Bank	<p>The following Sub-Clause is added after Sub-Clause 1.16:</p> <p>“The Contractor shall permit and shall cause its agents (whether declared or not), subcontractors, subconsultants, service providers, suppliers and their personnel, to permit the Bank and/or persons appointed by the Bank to inspect the site and/or the accounts, records and other documents relating to the procurement process, tender submission, proposal submission and contract execution, and to have such accounts, records and other documents audited by auditors appointed by the Bank.”</p>
Sub-Clause 2.1 Right of Access to the Site	<p>Add after the first sentence of the first paragraph:</p> <p>“For any part of the Site (or the whole Site as the case may be) for which the Contractor is to be given access to, and possession of, there shall be no physical works at the Site or any part thereof (as the case may be) unless the Employer shall give a Notice to the Contractor stating that all relevant provisions of the applicable Resettlement Plan (RP) were complied with and confirming that all compensation to the affected persons have been duly paid as per the RP. This Notice shall specify the date on which access to, and possession of the part of the Site (or the whole Site as the case may be) shall be given to the Contractor.”</p>
Sub-Clause 2.4 Employer’s Financial Arrangements	<p>The first paragraph is replaced with:</p> <p>“The Employer shall submit, before the Commencement Date, reasonable evidence that financial arrangements have been made for financing the Employer’s obligations under the Contract.”</p> <p>The following sub-paragraph is added at the end of Sub-Clause 2.4:</p> <p>“In addition, if the Bank has notified to the Recipient that the Bank has suspended disbursements under its loan, which finances in whole or in part the execution of the Works, the Employer shall give notice of such suspension to the Contractor with detailed particulars, including the date of such notification, with a copy to the Engineer, within 7 days of the Recipient having received the suspension notification from the Bank. If alternative funds will be available in appropriate currencies to the Employer to continue making payments to the Contractor beyond 60 days after the date of Bank notification of the suspension, the Employer shall provide reasonable evidence in its notice of the extent to which such funds will be available.”</p>

<p>Sub-Clause 3.1 The Engineer</p>	<p>The following is added at the end of the first subparagraph: “The Engineer’s staff shall include suitably qualified engineers and other professionals who are competent to carry out these duties.”</p>
<p>Sub-Clause 3.2 Engineer’s Duties and Authority</p>	<p>The Engineer shall obtain the consent in writing of the Employer before taking action under the following Sub-Clauses of these Conditions:</p> <p style="padding-left: 40px;">(a) Sub-Clause 13.1: Right to vary - instructing a variation, except;</p> <p style="padding-left: 80px;">(i) in an emergency situation as determined by the Engineer; or</p> <p style="padding-left: 80px;">(ii) if such a Variation would increase the Accepted Contract Amount by less than the percentage specified in the Contract Data.</p> <p style="padding-left: 40px;">(b) Sub-Clause 13.2 (Value Engineering): stating consent or otherwise to a value engineering proposal submitted by the Contractor in accordance with Sub-Clause 13.2.</p> <p>Notwithstanding the obligation, as set out above, to obtain consent in writing, if, in the opinion of the Engineer, an emergency occurs affecting the safety of life or of the Works or of adjoining property, it may, without relieving the Contractor of any of his duties and responsibility 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, despite the absence of consent of the Employer, with any such instruction of the Engineer. The Engineer shall determine an addition to the Contract Price, in respect of such instruction, and EOT if any, in accordance with Clause 13 and shall notify the Contractor accordingly, with a copy to the Employer.</p> <p>The Engineer shall promptly notify the Employer, in writing and in advance, of the initiation, instruction/proposal, or requirement of any Variation, that are within the Engineer’s authority under the Works Contracts.</p> <p>For all Variations exceeding the Engineer’s authority under the Works Contract, submit full technical, financial, and contractual justification and obtain the Employer’s prior written approval before taking any step to progress, recommend, or issue such Variation except in case of emergency. The Engineer shall involve the Employer at every stage of the Variation process, and no Variation shall be issued without the Employer’s explicit written approval.</p> <p>The Engineer shall promptly notify on any matter that may have cost, time, risk, or contractual implications under the Civil Works Contract, including but not limited to matters arising from adverse physical conditions, suspension of works, claims, extension of time, liquidated damages, taking-over and completion certification, defects liability, special risks, or any other relevant provisions of the Contract.</p>

<p>Sub-Clause 3.3 Engineer's Representative</p>	<p>Add the following third paragraph after paragraph 2.</p> <p>“The Engineer shall obtain the consent of the Employer before appointing or replacing an Engineer's Representative.”</p> <p>Add the following fourth paragraph after paragraph 3.</p> <p>“The Employer may require the Engineer to immediately remove (or cause to be removed) any Engineer's Representative who is found, based on reasonable evidence, to have engaged in corrupt, fraudulent, collusive or coercive practice.”</p>
<p>Sub-Clause 3.4 Delegation by the Engineer</p>	<p>The following is added at the end of the second paragraph:</p> <p>“If any assistants are not fluent in this language, the Engineer shall make competent interpreters available during all working hours, in a number sufficient for those assistants to properly perform their assigned duties and/or exercise their delegated authority.”</p>
<p>Sub-Clause 4.1 Contractor's General Obligations</p>	<p>The following is inserted after the paragraph “The Contractor shall provide the Plant (and spare parts, if any)...”:</p> <p>“All equipment, material and services to be incorporated in or required for the Works shall have their origin in any eligible source country as defined by the Bank.”</p> <p>The following is inserted after the paragraph “The Contractor shall, whenever required by the Engineer...”:</p> <ul style="list-style-type: none"> • The Contractor shall not carry out mobilization to Site (e.g., limited clearance for haul roads, site accesses and work site establishment, geotechnical investigations or investigations to select ancillary features such as quarries and borrow pits) unless the Engineer gives consent, a consent that shall not be unreasonably delayed, that appropriate measures are in place to address environmental and social risks and impacts, which at a minimum shall include applying the Management Strategies and Implementation Plans (MSIPs) and Code of Conduct for Contractor's Personnel submitted as part of the Tender and agreed as part of the Contract. • The Contractor shall submit to the Engineer for Review any additional MSIPs as are necessary to manage the ESHS risks and impacts of ongoing Works (e.g., excavation, earthworks, bridge and structure works, stream and road diversions, quarrying or extraction of materials, concrete batching and asphalt manufacture). These MSIPs collectively comprise the Contractor's Environmental and Social Management Plan (C-ESMP) and Occupational & Community Health Safety Management Plan (OCHSMP). The Contractor shall review the C-ESMP, periodically (but not less than every six (6) months), and update it as required to ensure that it contains measures appropriate to the Works. The updated C-ESMP and OCHSMP and other associated plans

	<p>recommended in the ESIA/ESMP etc, shall be submitted to the Engineer for Review.</p> <p>The C-ESMP and OCHSMP shall be part of the Contractor’s Documents. The procedures for Review of the C-ESMP and OHSMP and its updates shall be as described in Sub-Clause 4.4.1 [<i>Preparation and Review</i>].</p> <p>The following is added as (g); (g) and (h) of the Sub-Clause are then renumbered as (h) and (i), respectively.</p> <p>(g) if so stated in the Specification, the Contractor shall:</p> <ul style="list-style-type: none"> (i) design structural elements of the Works taking into account climate change considerations; and (ii) apply the concept of universal access (the concept of universal access means unimpeded access for people of all ages and abilities in different situations and under various circumstances. <p>The following is added at the end of the Sub-Clause:</p> <p>“The Contractor shall provide relevant contract- related information, as the Employer and/or Engineer may reasonably request to conduct Stakeholder engagements. “Stakeholder” refers to individuals or groups who:</p> <ul style="list-style-type: none"> (i) are affected or likely to be affected by the Contract; and (ii) may have an interest in the Contract. <p>The Contractor may also directly participate in Stakeholder engagements, as the Employer and/or Engineer may reasonably request.”</p> <p>The Contractor shall prepare, submit C-ESMP (including all sub management plans as mentioned in ESIA/ESMP) and OCHSMP within 28 days of contract signing and before mobilization for approval. The Engineer’s NOC/approval is required before commencement of work. These C-ESMP (including sub-plans) and OCHSMP will be updated periodically (quarterly basis or as required) upon update/change in design, work methodology, identification of new risks or in-case of serious incident.</p> <p>The Contractor shall implement a C-ESMP and OHSMP in accordance with the requirements outlined in Section 7 of the Works’ Requirements. The C-ESMP and OHSMP shall include all required Management Strategies and Implementation Plans.</p> <p>Failure to implement the approved C-ESMP and OHSMP, comply with Occupational Health and Safety standards, or maintain an operational GRM shall be considered a material breach of contract.</p>
<p>Sub-Clause 4.2.1 Contractor’s obligations</p>	<p>The first paragraph is replaced with:</p> <p>“The Contractor shall deliver the Performance Security to the Employer within 28 days after receiving the Letter of Acceptance and shall send a copy to the Engineer. The Performance Security shall be in the form of an unconditional, irrevocable, on-demand bank guarantee issued by a scheduled bank in the Country or by a foreign bank located outside the Country and counter-guaranteed by a scheduled bank in the Country to make it encashable by a bank in the Employer’s country. The Performance</p>

	<p>Guarantee shall be in the form annexed to the Particular Conditions or in another form approved by the Employer.”</p> <p>Add the following second and third paragraph: “In this Sub-Clause, the term ‘scheduled bank’ means any bank selected by the Contractor that is listed in the second schedule of the State Bank of Pakistan Act, 1956. The State Bank of Pakistan (SBP), which is the Country’s central bank, maintains this schedule. The second schedule includes banks that are authorized to operate in the Country and are regulated by the SBP.</p> <p>In case of Joint Venture (JV), where the term JV includes consortium or other unincorporated grouping of two or more persons, the Performance Security must be in the name of JV.”</p>
Sub-Clause 4.2.2 Claims under the Performance Security	The first paragraph is replaced in its entirety with: “The Employer shall not make a claim under the Performance Security, except for amounts for which the Employer is entitled under the Contract.”
Sub-Clause 4.2.3 Return of Performance Security	In sub-paragraph (a) “21 days” is replaced with: “28 days”
Sub-Clause 4.3 Contractor’s Representative	The following is added at the end of the last paragraph: “If any of these persons is not fluent in this language, the Contractor shall make competent interpreters available during all working hours in a number deemed sufficient by the Engineer.”
Sub-Clause 4.4.1 Preparation and Review	<p>In the first paragraph, delete the word “and” at the end of sub-paragraph (c), at the end of sub-paragraph (d) replace “.” with “; and” and add sub-paragraph(e) as follows:</p> <p>“(e) described in Sub-Clause 4.4.4 [Site-Specific Occupational and Community Health and Safety Management Plan] and Sub-Clause 4.4.5 [Contractor’s Environment and Social Management Plan]; and”</p>
Sub-Clause 4.4.3 Operation and Maintenance Manuals	<p>Delete the first paragraph and replace with:</p> <p>“The operation and maintenance manuals shall be prepared by the Contractor as stated in the Specification (if not stated, as acceptable to the Engineer).”</p>
Sub-Clause 4.6 Co-operation	<p>The following is added after the first paragraph:</p> <p>“The Contractor shall also, as stated in the Specification or as instructed by the Engineer, cooperate with and allow appropriate opportunities for the Employer’s Personnel to conduct any environmental and social assessment.”</p>

<p>Sub-Clause 4.7 Setting out</p>	<p>In the second bullet point of subparagraph (b) of Sub-Clause 4.7.3: before “if the items of reference”, add: “when examining the items of reference within the period stated in subparagraph (a) of Sub-Clause 4.7.2” on the second and third lines, delete “and the contractor’s Notice is given after the period stated in subparagraph (a) of Sub-Clause 4.7.2”.</p>
<p>Sub-Clause 4.8 Health and Safety Obligations</p>	<p>The following are included after deleting “and” at the end of (f) and replacing “.” with “;” at the end of (g):</p> <ul style="list-style-type: none"> • provide health and safety training of Contractor’s Personnel as appropriate and maintain training records; • actively engage the Contractor’s Personnel in promoting understanding, and methods for, implementation of health and safety requirements, as well as in providing information to Contractor’s Personnel, training on occupational safety and health, and provision of personal protective equipment without expense to the Contractor’s Personnel; • put in place workplace processes for Contractor’s Personnel to report work situations that they believe are not safe or healthy, and to remove themselves from a work situation which they have reasonable justification to believe presents an imminent and serious danger to their life or health; • Contractor’s Personnel who remove themselves from such work situations shall not be required to return to work until necessary remedial action to correct the situation has been taken. Contractor’s Personnel shall not be retaliated against or otherwise subject to reprisal or negative action for such reporting or removal; • subject to Sub-Clause 4.6, where the Employer’s Personnel, any other contractors employed by the Employer and/or personnel of any legally constituted public authorities and private utility companies are employed in carrying out, on or near the site, of any work not included in the Contract, collaborate in applying the health and safety requirements, without prejudice to the responsibility of the relevant entities for the health and safety of their own personnel; and • establish and implement a system for regular (not less than every six months) review of health and safety performance and the working environment.” <p>The second and third paragraphs are replaced with the following: “Within 21 days of the Commencement Date and before commencing any construction on the Site, the Contractor shall submit to the Engineer for Review a health and safety manual which has been specifically prepared for the Works, the Site and other places (if any) where the Contractor intends to execute the Works. The procedures for Review of the health and safety manual and its updates shall be as described in Sub-Clause 4.4.1 [Preparation and Review].”</p>

The health and safety manual shall be in addition to any other similar document required under applicable health and safety regulations and Laws.

The health and safety manual shall set out all the health and safety requirements under the Contract,

- which shall include at a minimum:
 - (a) the procedures to establish and maintain a safe working environment without risk to health at all workplaces, machinery, equipment and processes under the control of the Contractor, including control measures for chemical, physical and biological substances and agents;
 - (b) details of the training to be provided, records to be kept;
 - (c) the procedures for prevention, preparedness and response activities to be implemented in the case of an emergency event (i.e. an unanticipated incident, arising from both natural and man-made hazards, typically in the form of fire, explosions, leaks or spills, which may occur for a variety of different reasons including failure to implement operating procedures that are designed to prevent their occurrence, extreme weather or lack of early warning);
 - (d) remedies for adverse impacts such as occupational injuries, deaths, disability and disease;
 - (e) the measures to be taken to avoid or minimize the potential for community exposure to waterborne, water-based, water-related and vector-borne diseases,
 - (f) the measures to be implemented to avoid or minimize the spread of communicable diseases (including transfer of Sexually Transmitted Diseases or Infections (STDs), such as HIV virus) and non-communicable diseases associated with the execution of the Works, taking into consideration differentiated exposure to and higher sensitivity of vulnerable groups. This includes taking measures to avoid or minimize the transmission of communicable diseases that may be associated with the influx of temporary or permanent Contract-related labor;
 - (g) the policies and procedures on the management and quality of accommodation and welfare facilities if such accommodation and welfare facilities are provided by the Contractor in accordance with Sub-Clause 6.6; and
- any other requirements stated in the Specification.

The paragraph starting with: "In addition to the reporting requirement of..." is replaced with the following:

"In addition to the reporting requirement of subparagraph (g) of Sub-Clause 4.20 [*Progress Reports*] the Contractor shall inform the Engineer immediately of any allegation, incident or accident in the Site, which has or is likely to have a significant adverse effect on the environment, the affected communities, the public, Employer's Personnel or Contractor's Personnel.

	<p>This includes, but is not limited to, any incident or accident-causing fatality or serious injury, significant adverse effects or damage to private property, or any allegation of SEA. In case of SEA, while maintaining confidentiality as appropriate, the type of allegation (sexual exploitation or sexual abuse), gender and age of the person who experienced the alleged incident shall be included in the information.</p> <p>The Contractor, upon becoming aware of the allegation, incident or accident, shall also immediately inform the Engineer of any such incident or accident on the Subcontractors' or suppliers' premises relating to the Works which has or is likely to have a significant adverse effect on the environment; the affected communities; the public; Employer's Personnel or Contractor's, its Subcontractors' and suppliers' personnel. The notification shall provide sufficient detail regarding such incidents or accidents. The Contractor shall provide full details of such incidents or accidents to the Engineer within the timeframe agreed with the Engineer.</p> <p>The Contractor shall require its Subcontractors and suppliers (other than Subcontractors) to immediately notify the Contractor of any incidents or accidents referred to in this Sub-clause."</p>
<p>Sub-Clause 4.8.1 Emergency Preparedness and Response</p>	<p>The following is added as Sub-Clause 4.8.1:</p> <p>The contractor shall prepare the Emergency Preparedness and Response Plan (EPRP) as part of C-ESMP or OCHSMP and submit along with these plan. This plan shall be drilled semi-annual basis and include but not limited to:</p> <ul style="list-style-type: none"> • identification of potential emergencies • Clear command and responsibilities • Communication protocols with provincial and national emergency response agency • List of agencies for emergency response and their numbers • Location and maintenance schedule for emergency equipment • Evacuation route, assembly point, • Procedure for incident reporting and notification to Engineer, Employer and relevant agencies • Compliance with national and provincial emergency response protocols <p>Recording procedure and reporting protocols</p>
<p>Sub-Clause 4.15 Access Route</p>	<p>The following is added at the end of Sub-Clause 4.15:</p> <p>"The Contractor shall take all necessary safety measures to avoid the occurrence of incidents and injuries to any third party, associated with the use of, if any, the Contractor's Equipment on access routes and other public roads or other infrastructure.</p> <p>The Contractor shall monitor road safety incidents and accidents to identify safety issues and establish and implement necessary measures to resolve them.</p>

	<p>The Contractor shall adequately record the condition of roads, agricultural land adjacent to access route and other infrastructure prior to the start of transporting Goods.</p> <p>The Contractor shall be liable for the reinstatement of all such access routes, agricultural land, and other public roads and infrastructure to the extent any such damages were caused by the Contractor. “</p>
Sub-Clause 4.16 Transport of Goods	<p>In sub-paragraph (c), after the word “permits”, add “taxes, duties”.</p> <p>The following is added at the end of this Sub-Clause: “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.”</p>
Sub-Clause 4.18 Protection of the Environment	<p>Sub-Clause 4.18 Protection of the Environment is replaced with: “The Contractor shall take all necessary measures to:</p> <ul style="list-style-type: none"> • protect the environment (both on and off the Site); and • limit damage and nuisance to people and property resulting from pollution, noise and other results of the Contractor’s operations and/or activities. <p>The Contractor shall ensure that emissions, surface discharges, effluent and any other pollutants from the Contractor’s activities shall exceed neither the values indicated in the Specification, nor those prescribed by applicable Laws.</p> <p>In the event of damage to the environment, property and/or nuisance to people, on or off Site as a result of the Contractor’s operations, the Contractor shall agree with the Engineer the appropriate actions and time scale to remedy, as practicable, the damaged environment to its former condition. The Contractor shall implement such remedies at its cost to the satisfaction of the Engineer.”</p> <p>All the project E&S instruments (namely but not limited to the ESIA, ESMP, LMP, SEP, RAP, GAP, ESAP,) shall be the integral and binding part of contract document. In case of any in-consistency between these document and other part of the contract, the provisions that provide highest level of E&S protection and compliance shall prevail.</p>
Sub-Clause 4.20 Progress Reports	<p>Replace 4.20 (g) with: “the Environmental, Social, Health and Safety (ESHS) Metrics for Progress Reports set out in Particular Conditions - Part D”</p> <p>The following is added at the end of the Sub-Clause:</p> <p>“In addition to the reporting requirement of this sub-paragraph (g) of Sub-Clause 4.20 [Progress Reports] upon becoming aware of its occurrence, the Contractor shall inform the Engineer within 24 hours of any allegation, incident or accident, which has or is likely to have a significant adverse effect on the environment, the affected communities, the public, Employer’s Personnel or Contractor’s Personnel. This includes, but is not limited to, any incident or accident-causing fatality or serious injury; significant adverse effects or damage to private property or to the natural environment, including protected areas and habitat of threatened species.</p>

	<p>The Contractor, upon becoming aware of the incident or accident, shall also inform the Engineer within 24 hours of any such incident or accident on the Subcontractors' or suppliers' premises relating to the Works that has or is likely to have a significant adverse effect on the environment, the affected communities, the public, Employer's Personnel or Contractor's, its Subcontractors' and suppliers' personnel.</p> <p>The notification shall provide sufficient detail regarding such incidents or accidents. The Contractor shall provide full details of such incidents or accidents to the Engineer within the timeframe outlined in the C-ESMP and OCHSMP or as agreed with the Engineer.</p> <p>The Contractor shall require its Subcontractors and suppliers to notify the Contractor of any incidents or accidents referred to in this Sub-Clause within the timeframe outlined in the C-ESMP and OCHSMP or as agreed with the Engineer.”</p> <p>Add the following as subparagraphs to Sub-Clause 4.21 of the GCC: “(i) monitoring of the obligations in Sub-Clauses [4.13, 4.18, 6.4, 6.7, 6.20, 6.21, 6.23 and 6.24.]”</p>
<p>Sub-Clause 4.21 Security of the Site</p>	<p>Sub-Clause 4.21 Security of the Site is replaced with:</p> <p>“Sub-Clause 4.21 Security of the Site</p> <p>The Contractor shall be responsible for the security of the Site, and:</p> <ul style="list-style-type: none"> (a) for keeping unauthorized persons off the Site; and (b) authorized persons shall be limited to the Contractor's Personnel, the Employer's Personnel and to any other personnel identified as authorized personnel (including the Employer's other contractors on the Site), by a Notice from the Employer or the Engineer to the Contractor. <p>The Contractor shall, within twenty-one (21) days of the Commencement Date, submit for the Engineer's No-Objection a security management plan that sets out the security arrangements for the Site.</p> <p>The Contractor shall (i) conduct appropriate background checks on any personnel retained to provide security; (ii) train the security personnel adequately (or determine that they are properly trained) in the use of force (and where applicable, firearms), and appropriate conduct toward Contractor's Personnel, Employer's Personnel and affected communities; and (iii) require the security personnel to act within the applicable Laws and any requirements set out in the Specification.</p> <p>The Contractor shall not permit any use of force by security personnel in providing security except when used for preventive and</p>

	<p>defensive purposes in proportion to the nature and extent of the threat.</p> <p>In making security arrangements, the Contractor shall also comply with any additional requirements stated in the Specification.”</p>
Sub-Clause 4.22 Contractor’s Operations on Site	On the third line of the second paragraph before “4.17”, “Sub- Clause” is added.
Sub-Clause 4.23 Archaeological and Geological Findings	<p>The first paragraph is replaced with the following:</p> <p>“All fossils, coins, articles of value or antiquity, structures, groups of structures, and other remains or items of geological, archaeological, paleontological, historical, architectural, or religious interest found on the Site shall be placed under the care and custody of the Employer. The Contractor shall:</p> <ul style="list-style-type: none"> a. take all reasonable precautions, including fencing-off the area or site of the finding, to avoid further disturbance and prevent Contractor’s Personnel or other persons from removing or damaging any of these findings; b. train relevant Contractor’s Personnel on appropriate actions to be taken in the event of such findings; and c. implement any other action consistent with the requirements of the Specification and relevant Laws.”
Sub-Clause 4.24 Suppliers (other than Subcontractors)	<p>4.24.1 Forced Labor</p> <p>The Contractor shall take measures to require its suppliers (other than Subcontractors) not to employ or engage forced labor including trafficked persons as described in Sub-Clause 6.21. If forced labor/trafficking cases are identified, the Contractor shall take measures to require the suppliers to take appropriate steps to remedy them. Where the supplier does not remedy the situation, the Contractor shall within a reasonable period substitute the supplier with a supplier that is able to manage such risks.</p> <p>4.24.2 Child Labor</p> <p>The Contractor shall take measures to require its suppliers (other than Subcontractors) not to employ or engage child labor as described in Sub-Clause 6.22. If child labor cases are identified, the Contractor shall take measures to require the suppliers to take appropriate steps to remedy them. Where the supplier does not remedy the situation, the Contractor shall within a reasonable period substitute the supplier with a supplier that is able to manage such risks.</p> <p>4.24.3 Serious Safety Issues</p> <p>The Contractor, including its Subcontractors, shall comply with all applicable safety obligations, including as stated in Sub-Clauses 4.8, 5.1 and 6.7. The Contractor shall also take measures to require its suppliers</p>

	<p>(other than Subcontractors) to introduce procedures and mitigation measures to address safety issues related to their personnel. If serious safety issues are identified, the Contractor shall take measures to require the suppliers to take appropriate steps to remedy them. Where the supplier does not remedy the situation, the Contractor shall within a reasonable period substitute the supplier with a supplier that is able to manage such risks.</p> <p>4.24.4 Obtaining Natural Resource Materials in Relation to Supplier</p> <p>The Contractor shall obtain natural resource materials from suppliers that can demonstrate, through compliance with the applicable verification and/or certification requirements, that obtaining such materials is not contributing to the risk of significant conversion or significant degradation of natural or critical habitats such as unsustainably harvested wood products, gravel or sand extraction from riverbeds or beaches.</p> <p>If a supplier cannot continue to demonstrate that obtaining such materials is not contributing to the risk of significant conversion or significant degradation of natural or critical habitats, the Contractor shall within a reasonable period substitute the supplier with a supplier that is able to demonstrate that they are not significantly adversely impacting the habitats.</p>
Sub-Clause 4.25 Code of Conduct	<p>The Contractor shall have a Code of Conduct for the Contractor's Personnel.</p> <p>The Contractor shall ensure that each Contractor's Personnel is provided a copy of this Code of Conduct, written in a language comprehensible to that person, and shall seek to obtain that person's signature acknowledging receipt of the same.</p> <p>The Contractor shall also ensure that the Code of Conduct is visibly displayed in multiple locations on the Site and any other place where the Works will be carried out, as well as in areas outside the Site accessible to the local community and project affected people. The posted Code of Conduct shall be provided in languages comprehensible to Contractor's Personnel, Employer's Personnel and the local community.</p>
Sub-Clause 5.1 Subcontractors	<p>The following is added at the beginning of the second paragraph. "The Contractor shall require that its Subcontractors execute the Works in accordance with the Contract, including complying with the relevant ESHS requirements."</p> <p>The following is added at the end of the last paragraph of Sub-Clause 5.1: "All subcontracts relating to the Works shall include provisions which entitle the Employer to require the subcontract to be assigned to the Employer under subparagraph (a) of Sub-Clause 15.2.3 [After Termination]."</p> <p>Where practicable, the Contractor shall give fair and reasonable opportunity for contractors from the Country to be appointed as Subcontractors."</p>
Sub-Clause 5.2.2	<p>In subparagraph (a), on the first line before "Subcontractor", "nominated" is added.</p>

<p>Objection to Nomination</p>	<p>In subparagraph (c):</p> <p>“and” is deleted from the end of (i);</p> <p>“.” at the end of (ii) is replaced with: “, and”.</p> <p>The following is then added as (iii):</p> <p>“(iii) be paid only if and when the Contractor has received from the Employer payments for sums due under the Subcontract referred to under Sub-Clause 5.2.3 [Payment to nominated Subcontractors].”</p>
<p>Sub-Clause 6.1 Engagement of Staff and Labor</p>	<p>The following paragraphs are added at the end of the Sub-Clause:</p> <p>“The Contractor shall provide the Contractor’s Personnel information and documentation that are clear and understandable regarding their terms and conditions of employment. The information and documentation shall set out their rights under relevant labor Laws applicable to the Contractor’s Personnel (which will include any applicable collective agreements), including their rights related to hours of work, wages, overtime, compensation and benefits, as well as those arising from any requirements in the Specification; and shall also include the Code of Conduct for Contractor’s Personnel as set forth in Sub-Clause 4.25. The Contractor’s Personnel shall be informed when any material changes to their terms or conditions of employment occur.</p> <p>The contractor proposed E&S personnel including -Lead EHS (as certified in its Tender) shall be present on site and their deployment as per schedule verified by the Engineer prior to the commencement of work.</p> <p>The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labor with appropriate qualifications and experience from sources within the Country.”</p>
<p>Sub-Clause 6.2 Rates of Wages and Conditions of Labor</p>	<p>The following paragraphs are added at the end of the Sub-Clause:</p> <p>“The Contractor shall inform the Contractor’s Personnel about:</p> <ul style="list-style-type: none"> (a) any deduction to their payment and the conditions of such deductions in accordance with the applicable Laws or as stated in the Specification; and (b) their liability to pay personal income taxes in the Country in respect of such of their salaries, wages, allowances and any benefits as are subject to tax under the Laws of the Country for the time being in force. <p>The Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such Laws.</p> <p>Where required by applicable Laws or as stated in the Specification, the Contractor shall provide the Contractor’s Personnel written notice of termination of employment and details of severance payments in a timely manner. The Contractor shall have paid the Contractor’s Personnel (either directly or where appropriate for their benefit) all due wages and entitlements including, as applicable, social security benefits and pension contributions, on or before the end of their engagement/ employment.”</p>

<p>Sub-Clause 6.5 Working Hours</p>	<p>The following is inserted at the end of the Sub-Clause:</p> <p>“The Contractor shall provide the Contractor’s Personnel annual holiday and sick, maternity, and family leave, as required by applicable Laws or as stated in the Specification.”</p> <p>“The Contractor shall have paid its staff and labor all due wages and entitlements on or before the end of their engagement or employment.”</p>
<p>Sub-Clause 6.6 Facilities for Staff and Labor</p>	<p>The following is inserted at the end of the first paragraph:</p> <p>“The Contractor shall ensure that such accommodation and welfare facilities meet the requirements of the health and safety manual.”</p> <p>The following is added as the last paragraph:</p> <p>“If stated in the Specification, the Contractor shall give access to or provide services that accommodate the physical, social and cultural needs of the Contractor’s Personnel. The Contractor shall also provide similar facilities for the Employer’s Personnel as stated in the Specification.”</p>
<p>Sub-Clause 6.7 Health and Safety of Personnel</p>	<p>In the second paragraph, “The Contractor” is replaced with:</p> <p>“Except as otherwise stated in the Specification, the Contractor...”</p>
<p>Sub-Clause 6.9 Contractor’s Personnel</p>	<p>The Sub-Clause is replaced with:</p> <p>“The Contractor’s Personnel (including Key Personnel, if any) shall be appropriately qualified, skilled, experienced and competent in their respective trades or occupations.</p> <p>The Engineer may require the Contractor to remove (or cause to be removed) any person employed on the Site or Works, including the Contractor’s Representative and Key Personnel (if any), who:</p> <ul style="list-style-type: none"> (a) persists in any misconduct or lack of care; (b) carries out duties incompetently or negligently; (c) fails to comply with any provision of the Contract; (d) persists in any conduct which is prejudicial to safety, health, or the protection of the environment; (e) based on reasonable evidence, is determined to have engaged in Prohibited Practice during the execution of the Works; (f) has been recruited from the Employer’s Personnel in breach of Sub-Clause 6.3 [Recruitment of Persons]; or (g) undertakes behavior which breaches the Code of Conduct for Contractor’s Personnel (ESHS). <p>If appropriate, the Contractor shall then promptly appoint (or cause to be appointed) a suitable replacement with equivalent skills and experience. In the case of replacement of the Contractor’s Representative, Sub-Clause 4.3 [Contractor’s Representative] shall apply. In the case of replacement of Key Personnel (if any), Sub-Clause 6.12 [Key Personnel] shall apply.</p> <p>Subject to the requirements in Sub-Clause 4.3 [Contractor’s Representative] and 6.12 [Key Personnel], and notwithstanding any requirement from the Engineer to remove or cause to remove any person, the Contractor shall take immediate action as appropriate in response to any violation of (a) through (g) above. Such immediate action shall include removing (or causing to be removed) from the Site or other places where</p>

	the Works are being carried out, any Contractor's Personnel who engages in (a), (b), (c), (d), (e) or (g) above or has been recruited as stated in (f) above."
Sub-Clause 6.12 Key Personnel	The following is inserted at the end of the last paragraph: "If any of the Key Personnel are not fluent in this language, the Contractor shall make competent interpreters available during all working hours in a number deemed sufficient by the Engineer."
Sub-Clause 6.13 Foreign Personnel	The Contractor may bring into the Country any foreign personnel who are necessary for the execution of the Works to the extent allowed by the applicable Laws. The Contractor shall ensure that these personnel are provided with the required residence visas and work permits. The Employer will, if requested by the Contractor, use its best endeavors in a timely and expeditious manner to assist the Contractor in obtaining any local, state, national, or government permission required for bringing in the Contractor's personnel. The Contractor shall be responsible for the return of these personnel to the place where they were recruited or to their domicile. In the event of the death in the Country of any of these personnel or members of their families, the Contractor shall similarly be responsible for making the appropriate arrangements for their return or burial.
Sub-Clause 6.14 Supply of Foodstuffs	The Contractor shall arrange for the provision of a sufficient supply of suitable food as may be stated in the Specification at reasonable prices for the Contractor's Personnel for the purposes of or in connection with the Contract.
Sub-Clause 6.15 Supply of Water	The Contractor shall, having regard to local conditions, provide on the Site an adequate supply of drinking and other water for the use of the Contractor's Personnel.
Sub-Clause 6.16 Measures against Insect and Pest Nuisance	The Contractor shall, at all times, take the necessary precautions to protect the Contractor's Personnel employed on the Site from insect and pest nuisance, and to reduce the danger to their health. The Contractor shall comply with all the regulations of the local health authorities, including on the use of appropriate insecticide.
Sub-Clause 6.17 Alcoholic Liquor or Drugs	The Contractor shall not, otherwise in accordance with the Laws of the Country, import, sell, give, barter, or dispose of any alcoholic liquor or drugs, or permit or allow importation, sale, gift, barter, or disposal thereto by the Contractor's Personnel.
Sub-Clause 6.18 Arms and Ammunition	The Contractor shall not give, barter, or dispose of, to any person, any arms or ammunition of any kind, or allow the Contractor's Personnel to do so.
Sub-Clause 6.19 Festivals and Religious Customs	The Contractor shall respect the Country's recognized festivals, days of rest and religious or other customs.
Sub-Clause 6.20 Funeral Arrangements	The Contractor shall be responsible, to the extent required by local regulations, for making any funeral arrangements for any of its local employees who may die while engaged upon the Works.
Sub-Clause 6.21 Forced Labor	The Contractor, including its Subcontractors, shall not employ or engage forced labor. Forced labor consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or

	<p>penalty, and includes any kind of involuntary or compulsory labor, such as indentured labor, bonded labor or similar labor-contracting arrangements.</p> <p>No persons shall be employed or engaged who have been subject to trafficking. Trafficking in persons is defined as the recruitment, transportation, transfer, harboring or receipt of persons by means of the threat or use of force or other forms of coercion, abduction, fraud, deception, abuse of power, or of a position of vulnerability, or of the giving or receiving of payments or benefits to achieve the consent of a person having control over another person, for the purposes of exploitation.</p>
Sub-Clause 6.22 Child Labor	<p>The Contractor, including its Subcontractors, shall not employ or engage a child under the age of 14 unless the national law specifies a higher age (the minimum age).</p> <p>The Contractor, including its Subcontractors, shall not employ or engage a child between the minimum age and the age of 18 in a manner that is likely to be hazardous, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development.</p> <p>The Contractor including its Subcontractors, shall only employ or engage children between the minimum age and the age of 18 after an appropriate risk assessment has been conducted by the Contractor with the Engineer's consent. The Contractor shall be subject to regular monitoring by the Engineer that includes monitoring of health, working conditions and hours of work.</p> <p>Work considered hazardous for children is work that, by its nature or the circumstances in which it is carried out, is likely to jeopardize the health, safety or morals of children. Such work activities prohibited for children include work:</p> <ul style="list-style-type: none"> (a) with exposure to physical, psychological or sexual abuse; (b) underground, underwater, working at heights or in confined spaces; (c) with dangerous machinery, equipment or tools, or involving handling or transport of heavy loads; (d) in unhealthy environments exposing children to hazardous substances, agents, or processes, or to temperatures, noise or vibration damaging to health; or (e) under difficult conditions such as work for long hours, during the night or in confinement on the premises of the employer.
Sub-Clause 6.23 Employment Records of Workers	<p>The Contractor shall keep complete and accurate records of the employment of labor at the Site. The records shall include the names, ages, genders, hours worked, and wages paid to all workers. These records shall be summarized on a monthly basis and submitted to the Engineer. These records shall be included in the details to be submitted by the Contractor under Sub-Clause 6.10 [Contractor's Records].</p>
Sub-Clause 6.24 Workers' Organizations	<p>In countries where the relevant labor laws recognize workers' rights to form and join workers' organizations of their choosing and to bargain collectively without interference, the Contractor shall comply with such laws. In such circumstances, the role of legally established workers' organizations and legitimate workers' representatives will be respected, and they will be provided with information needed for meaningful negotiation in a timely manner. Where the relevant labor laws substantially restrict workers' organizations, the Contractor shall enable alternative means for the</p>

	<p>Contractor's Personnel to express their grievances and protect their rights regarding working conditions and terms of employment. The Contractor shall not seek to influence or control these alternative means. The Contractor shall not discriminate or retaliate against the Contractor's Personnel who participate, or seek to participate, in such organizations and collective bargaining or alternative mechanisms. Workers' organizations are expected to fairly represent the workers in the workforce.</p>
<p>Sub-Clause 6.25 Non-Discrimination and Equal Opportunity</p>	<p>The Contractor shall not make decisions relating to the employment or treatment of Contractor's Personnel on the basis of personal characteristics unrelated to inherent job requirements. The Contractor shall base the employment of the Contractor's Personnel on the principle of equal opportunity and fair treatment and shall not discriminate with respect to any aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices.</p> <p>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.</p> <p>The Contractor shall provide protection and assistance as necessary to ensure non-discrimination and equal opportunity, including for specific groups such as women, people with disabilities, indigenous peoples and/or ethnic minorities, migrant workers and children (of working age in accordance with Sub-Clause 6.22).</p>
<p>Sub-Clause 6.26 Contractor's Personnel Grievance Mechanism</p>	<p>The Contractor shall have a grievance mechanism in line with the approved Project GRM for Contractor's Personnel, and where relevant, the workers' organizations stated in Sub-Clause 6.24 [Workers' Organizations], to raise workplace concerns. The grievance mechanism shall be proportionate to the nature, scale, risks, and impacts of the Contract. The mechanism shall address concerns promptly, using an understandable and transparent process that provides timely feedback to those concerned in a language they understand, without any retribution, and shall operate in an independent and objective manner.</p> <p>The Contractor's Personnel shall be informed of the grievance mechanism at the time of engagement for the Contract, and the measures put in place to protect them against any reprisal for its use. Measures will be put in place to make the grievance mechanism easily accessible to all Contractor's Personnel.</p> <p>The grievance mechanism shall not impede access to other judicial or administrative remedies that might be available or substitute for grievance mechanisms provided through collective agreements.</p> <p>The grievance mechanism may utilize existing grievance mechanisms, providing that they are properly designed and implemented, address concerns promptly, and are readily accessible to Contractor's Personnel. Existing grievance mechanisms may be supplemented as needed with Contract-specific arrangements.</p>
<p>Sub-Clause 6.27 Training of Contractor's Personnel</p>	<p>The Contractor shall provide appropriate training to relevant Contractor's Personnel on ESHS aspects of the Contract, including appropriate sensitization on prohibition of SEAH, and health and safety training referred to in Sub-Clause 4.8</p> <p>As stated in the Specification or as instructed by the Engineer, the Contractor shall also allow appropriate opportunities for the relevant</p>

	<p>Contractor's Personnel to be trained on ESHS aspects of the Contract by the Employer's Personnel.</p> <p>The Contractor shall provide training on SEAH, including its prevention, to any of its personnel who has a role to supervise other Contractor's Personnel.</p>
Sub-Clause 7.7 Ownership of Plant and Materials	<p>The following is added before the first paragraph: "Except as otherwise provided in the Contract,"</p> <p>Add the following paragraph at the end: "The Contractor shall however remain responsible for the safety, ambient or specialized storage (as required) and care of each item of Plant and Materials until the Employer's taking over under Sub-Clause 10 [Employer's Taking Over]."</p>
Sub-Clause 8.1 Commencement of Work	<p>The Sub- Clause is replaced in its entirety with the following: "The Engineer shall give a Notice to the Contractor stating the Commencement Date, not less than 14 days before the Commencement Date.</p> <p>The Notice shall be issued promptly after the Engineer determines the fulfilment of the following conditions: signature of the Contract Agreement by both Parties, and if required, approval of the Contract by relevant authorities of the Country; delivery to the Contractor of reasonable evidence of the Employer's financial arrangements (under Sub-Clause 2.4 [Employer's Financial Arrangements]); except if otherwise specified in the Contract Data, effective access to and possession of the Site given to the Contractor together with such permission(s) under (a) of Sub-Clause 1.13 [Compliance with Laws] as required for the commencement of the Works; receipt by the Contractor of the Advance Payment under Sub-Clause 14.2 [Advance Payment] provided that the corresponding bank guarantee has been delivered by the Contractor; and appointment of the DAAB.</p> <p>Subject to Sub-Clause 4.1 on the Management Strategies and Implementation Plans and the C-ESMP as well as OCHSMP and Sub-Clause 4.8 on the health and safety manual, the Contractor, shall commence the execution of the Works as soon as is reasonably practicable after the Commencement Date, and shall then proceed with the Works with due expedition and without delay."</p>
Sub-Clause 11.2 Cost of Remedying Defects	<p>Add the following paragraph at the end of this Sub-Clause: "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 obligation in Clause 4.16."</p>
Sub-Clause 11.7 Right of Access after Taking Over	<p>In the second paragraph, "Whenever the Contractor intends to access any part of the Works during the relevant DNP:" is replaced with: "Whenever, until the date twenty-eight (28) days after issue of the Performance Certificate, the Contractor intends to access any part of the Works:"</p>
Sub-Clause 13.3.1 Variation by Instruction	<p>Sub-paragraph 13.3.1 (a) is replaced with: "a description of the varied work performed or to be performed, including details of the resources and methods adopted or to be adopted by the Contractor, and sufficient</p>

	information to enable an evaluation of environment, health, and safety risks and impacts;”
Sub-Clause 13.4 Provisional Sums	<p>The following is inserted as the penultimate paragraph:</p> <p>“A specific Provisional Sum for the work of the DAAB shall be used to cover the Employer's share of the DAAB members’ fees and expenses, in accordance with Clause 21 [Dispute and Arbitration]. Notwithstanding the foregoing, no prior instruction of the Engineer shall be required for use of this specific Provisional Sum. The Contractor shall submit the DAAB members’ invoices and satisfactory evidence of having paid 100% of such invoices as part of supporting documents of those Statements submitted under Sub-Clause 14.3 [Application for Interim Payment]. No overhead and profit shall be paid to the Contractor in respect of the Provisional Sum”.</p> <p>The following is added at the end of the first paragraph:</p> <p>If the Bill of Quantities includes Provisional Sums for contingencies, it shall be used, in whole or part, at the discretion, and in accordance with the instructions, of the Engineer, to meet any of the Employer’s payment obligations in connection with or arising out of the Contract.</p>
Sub-Clause 13.6 Adjustments for Changes in Laws	<p>The following paragraph is added at the end of the Sub-Clause:</p> <p>“Notwithstanding the foregoing, the Contractor shall not be entitled to an extension of time if the relevant delay has already been taken into account in the determination of a previous extension of time and such Cost shall not be separately paid if the same shall already have been taken into account in the indexing of any inputs to the Table of Adjustment Data in accordance with the provisions of Sub-Clause 13.7 [Adjustments for Changes in Cost].”</p>
Sub-Clause 14.1 The Contract Price	<p>The following paragraph is added at the end of the Sub-Clause:</p> <p>“Notwithstanding the provisions of sub-paragraph (b), Contractor's Equipment, including essential spare parts, imported by the Contractor for the sole purpose of executing the Contract shall be temporarily exempt from the payment of import duties and taxes upon initial importation, provided the Contractor shall post with the customs authorities at the port of entry an approved export bond or bank guarantee, valid until the Time of Completion plus 6 months, in an amount equal to the full import duties and taxes that would be payable on the assessed imported value of such Contractor's Equipment and spare parts, and callable in the event the Contractor's Equipment is not exported from the Country on completion of the Contract. A copy of the bond or bank guarantee endorsed by the customs authorities shall be provided by the Contractor to the Employer upon the importation of individual items of Contractor's Equipment and spare parts. Upon export of individual items of the Contractor's Equipment or spare parts, or upon the completion of the Contract, the Contractor shall prepare, for approval by the customs authorities, an assessment of the residual value of the Contractor's Equipment and spare parts to be exported, based on the depreciation scale(s) and other criteria used by the customs authorities for such purposes under the provisions of the applicable Laws. Import duties and taxes shall be due and payable to the customs authorities by the Contractor on (a) the difference between the initial imported value and the residual value of the Contractor's Equipment and spare parts to exported; and (b) on the initial imported value of the Contractor's Equipment and spare parts remaining in the Country after the completion of the Contract. Upon payment of such dues within 28 days of being invoiced, the bond or bank guarantee shall be reduced or released accordingly, otherwise the security shall be called in the full amount remaining.”</p>
Sub-Clause 14.2.1	The first paragraph is replaced with:

Advance Payment Guarantee	“The Contractor shall obtain (at the Contractor’s cost) an Advance Payment Guarantee in amounts and currencies equal to the advance payment and shall submit it to the Employer with a copy to the Engineer. This guarantee shall be issued by reputable bank or financial institution selected by the Contractor and shall be based on the sample form annexed to the Particular Conditions or in another form agreed by the Employer (but such agreement shall not relieve the Contractor from any obligation under this Sub-Clause).”
Sub-Clause 14.3 Application for Interim Payment	The following is inserted at the end of (vi) after: [Agreement or Determination]: “any reimbursement due to the Contractor under the Dispute Avoidance/ Adjudication Agreement. (Appendix General Conditions of Dispute Avoidance/ Adjudication Agreement).”
Sub-Clause 14.6.2 Withholding (Amounts in) an IPC	<p>“and/or” from subparagraph (b) is deleted.</p> <p>The following is then added as subparagraph (c) and subparagraph (c) of the Sub-Clause is renumbered as (d):</p> <p>“(c) if the Contractor was, or is, failing to perform any ESHS obligations or work under the Contract, the value of this work or obligation, as determined by the Engineer, may be withheld until the work or obligation has been performed, and/or the cost of rectification or replacement, as determined by the Engineer, may be withheld until rectification or replacement has been completed. Failure to perform includes, but is not limited to the following:</p> <ul style="list-style-type: none"> (i) failure to comply with any ESHS obligations or work described in the Works’ Requirements which may include: working outside site boundaries, excessive dust, damage to offsite vegetation, pollution of water courses from oils or sedimentation, contamination of land, e.g., from oils, human waste, damage to archaeology or cultural heritage features, air pollution as a result of unauthorized and/or inefficient combustion; (ii) failure to regularly review C-ESMP and/or update it in a timely manner to address emerging ESHS issues, or anticipated risks or impacts; (iii) failure to implement the C-ESMP, e.g., failure to provide required training or sensitization; (iv) failing to have appropriate consents/permits prior to undertaking Works or related activities; (v) failure to submit ESHS report/s (as described in Particular Conditions - Part D), or failure to submit such reports in a timely manner; or (vi) failure to implement remediation as instructed by the Engineer within the specified timeframe (e.g., remediation addressing noncompliance/s).”
Sub-Clause 14.7 Payment	<p>At the end of subparagraph (b): “and” is replaced with “or” and the following inserted as (iii):</p> <p>“(iii) at a time when the Bank’s loan (from which part of the payments to the Contractor is being made) is suspended, the amount shown on any statement submitted by the Contractor within fourteen (14) days after such statement is submitted, any discrepancy being rectified in the next payment to the Contractor; and”</p> <p>At the end of subparagraph (c): “.” is replaced with “;” and the following inserted:</p>

	<p>“or, at a time when the Bank’s loan (from which part of the payments to the Contractor is being made) is suspended the undisputed amount shown in the Final Statement within fifty-six (56) days after the date of notification of the suspension in accordance with Sub-Clause 16.2 [Termination by Contractor].”</p>
<p>Sub-Clause 14.9 Release of Retention Money</p>	<p>The following is added at the end of Sub-Clause 14.9:</p> <p>“Unless otherwise stated in the Contract, when the Taking-Over Certificate has been issued for the Works and the first half of the Retention Money has been certified for payment by the Engineer, the Contractor shall be entitled to substitute a guarantee, in the form annexed to the Particular Conditions or in another form approved by the Employer and issued by a reputable bank or financial institution selected by the Contractor, for the second half of the Retention Money. The Contractor shall ensure that the guarantee is in the amounts and currencies of the second half of the Retention Money and is valid and enforceable until the Contractor has executed and completed the Works and remedied any defects, as specified for the Performance Security under Sub-Clause 4.2. On receipt by the Employer of the required guarantee, the Engineer shall certify and pay the second half of the Retention Money. The release of the second half of the Retention Money against a guarantee shall then be in lieu of the release after the latest of the expiry dates of the Defects Notification Periods. The Employer shall return the guarantee to the Contractor within 21 days after receiving a copy of the Performance Certificate.</p> <p>If the Performance Security required under Sub-Clause 4.2 is in the form of a demand guarantee, and the amount guaranteed under it when the Taking-Over Certificate is issued is more than half of the Retention Money, then the Retention Money guarantee will not be required. If the amount guaranteed under the Performance Security, when the Taking-Over Certificate is issued is less than half of the Retention Money, the Retention Money guarantee will only be required for the difference between half of the Retention Money and the amount guaranteed under the Performance Security.”</p>
<p>Sub-Clause 14.15 Currencies of Payment</p>	<p>Throughout Sub-Clause 14.15, “Contract Data” is replaced with:</p> <p>“Schedule of Payment Currencies or the Bill of Quantities (in case the use of various currencies is stated in the Bill of Quantities itself), as applicable”.</p>
<p>Sub-Clause 15.1 Notice to Correct</p>	<p>“and” is deleted at the end of (b) and “.” is replaced by: “; and” in (c).</p> <p>The following is then added as (d): “(d) specify the time within which the Contractor shall respond to the Notice to Correct.”</p> <p>In the third paragraph, “shall immediately respond” is replaced with: “shall respond within the time specified in (d)”.</p> <p>Further, at the end of the third paragraph, “to comply with the time specified in the Notice to Correct.” is replaced with: “to comply with the time specified in (c).”</p>
<p>Sub-Clause 15.2.1 Notice</p>	<p>Sub-paragraph (h) is replaced with: “is found, based on reasonable evidence, to have engaged in Prohibited Practices as defined in Paragraph 2. of Part C of the Particular Conditions [Prohibited Practices], in competing for or in executing the Contract.”</p>
<p>Sub-Clause 15.8 Fraud and Corruption</p>	<p>The Sub-Clause heading “Fraud and Corruption” is replaced with “Prohibited Practices”; and the following new Sub-Clauses are added:</p>

	<p>“15.8.1 The Bank requires compliance with the Bank’s Policy on Prohibited Practices (as amended from time to time), as set forth in Particular Conditions - Part C- Prohibited Practices.</p> <p>15.8.2 The Employer requires the Contractor to disclose any commissions, gratuities, or fees that may have been paid or are intended to be paid to agents or any other party with respect to the tendering process or execution of the Contract. The information disclosed must include at least the name and address of the agent or other party, the amount and currency, and the purpose of the commission, gratuity, or fee.”</p>
Sub-Clause 16.1 Suspension by Contractor	<p>The following paragraph is inserted after the first paragraph:</p> <p>“Notwithstanding the above, if the Bank has suspended disbursements under the loan from which payments to the Contractor are being made, in whole or in part, for the execution of the Works, and no alternative funds are available as provided for in Sub-Clause 2.4 [Employer’s Financial Arrangements], the Contractor may by notice suspend work or reduce the rate of work at any time, but not less than seven (7) days after the Recipient having received the suspension notification from the Bank.”</p>
Sub-Clause 16.2.1 Notice	<p>Subparagraph (j) is deleted in its entirety.</p> <p>At the end of subparagraph (i): “; or” is replaced with: “.”</p> <p>subparagraph (f) is replaced with:</p> <p>“(f) the Contractor does not receive a Notice of the Commencement Date under Sub-Clause 8.1 [Commencement of Works] within one hundred eighty (180) days after receiving the Letter of Acceptance, for reasons not attributable to the Contractor.”</p>
Sub-Clause 16.2.2 Termination	<p>The following is added at the end of Sub-Clause 16.2.2:</p> <p>“In the event the Bank suspends the loan or grant from which part or whole of the payments to the Contractor are being made, if the Contractor has not received the sums due to him by the expiry of 14 days after the relevant time period referred to in Sub-Clause 14.7 [Payment], issuance of the Interim Payment Certificates to which they relate, the Contractor may, without prejudice to the Contractor’s entitlement to financing charges under Sub-Clause 14.8 [Delayed Payment], take one of the following actions: (i) suspend work or reduce the rate of work under Sub-Clause 16.1 above, or (ii) terminate the Contract by giving Notice to the Employer, with a copy to the Engineer, such termination to take effect 14 days after giving the Notice.”</p>
Sub-Clause 16.3 Contractor’s Obligation After Termination	<p>“and” is deleted from the end of subparagraph (b), subparagraph (c) deleted and the following added:</p> <p>(b) deliver to the Engineer all Employer-Supplied Materials and/or Employer’s Equipment made available to the Contractor in accordance with Sub-Clause 2.6 [Employer-Supplied materials and Employer’s Equipment]; and</p> <p>(c) Remove all other Goods from the Site, except as necessary for safety, and leave the Site.”</p>
Sub-Clause 17.1 Responsibility for Care of the Works	<p>On the fourth and fifth lines of the first paragraph, replace “Date of Completion of the Works” with “issue of the Taking-Over Certificate for the Works”.</p> <p>[If Employer-Supplied Materials are listed in the Specification for the Contractor’s use in the execution of Works, include the following provision. See also Sub-Clause 2.6 [Employer-Supplied Materials and Employer’s Equipment]]</p>

	<p>After the two instances of “Goods” in the last paragraph, the following is added: “Employer- Supplied Materials”.</p> <p>[If Employer’s Equipment are listed in the Employer’s Requirements for the Contractor’s use in the execution of Works, include the following provision. See also Sub-Clause 2.6 (Employer-Supplied Materials and Employer’s Equipment)]</p> <p>After the two instances of “Goods” in the last paragraph, the following is added: “, Employer’s Equipment.”.</p>
Sub-Clause 17.3 Intellectual and Industrial Property Rights	On the first line of the second paragraph, replace “notice” is replaced with “a Notice.”
Sub-Clause 17.7 Use of Employer’s Accommodation/Fa cilities	<p>The following Sub-Clause is added as 17.7:</p> <p>“The Contractor shall take full responsibility for the care of the Employer-provided accommodation and facilities, if any, as detailed in the Specification, from the respective dates of hand over to the Contractor until cessation of occupation (where hand over or cessation of occupation may take place after the date stated in the Taking-Over Certificate for the Works).</p> <p>If any loss or damage happens to any of the above items while the Contractor is responsible for their care arising from any cause whatsoever other than those for which the Employer is liable, the Contractor shall, at its own cost, rectify the loss or damage to the satisfaction of the Engineer.”</p>
Sub-Clause 18.1 Exceptional Events	“Sub-paragraph (c) is substituted with (c) riot, commotion, disorder, or sabotage by persons other than the Contractor’s Personnel and other employees of the Contractor and Subcontractors;”
Sub-Clause 18.4 Consequences of an Exceptional Event	The following is added at the end of sub-paragraph (b) after deleting the “.”: “, including the costs of rectifying or replacing the Works and/or Goods damaged or destroyed by Exceptional Events, to the extent they are not indemnified through the insurance policy referred to in Sub-Clause 19.2 [Insurance to be provided by the Contractor].”
Sub-Clause 18.5 Optional Termination	In sub-paragraph (c), “and necessarily” is inserted after “was reasonably”.
Sub-Clause 19.1 General Requirements	<p>The following paragraphs are added after the first paragraph:</p> <p>“Wherever the Employer is the insuring Party, each insurance shall be effected with insurers and in terms acceptable to the Contractor. These terms shall be consistent with terms (if any) agreed by both Parties before the date of the Letter of Acceptance.</p> <p>This agreement of terms shall take precedence over the provisions of this Clause.</p>
Sub-Clause 19.2 insurance to be provided by the Contractor	The following is inserted as the first sentence in Sub-Clause 19.2: “The Contractor shall place all insurances relating to the Contract (including, but not limited to the insurance referred to in Clause 19) with insurers from the List of Eligible Countries as stated in Sub-Clause 1.5.”
Sub-Clause 19.2.5 Injury to employees	The second paragraph is replaced with:

	<p>“The Employer and the Engineer shall also be indemnified under the policy of insurance, against liability for claims, damages, losses, and expenses (including legal fees and expenses) arising from injury, sickness, disease, or death of any person employed by the Contractor or any other of the Contractor’s Personnel, except that this insurance may exclude losses and claims to the extent that they arise from any act or neglect of the Employer or of the Employer’s Personnel.”</p>
Sub-Clause 20.1 Claims	In a): “any additional payment” is replaced with “any payment”.
Sub-Clause 20.2 Claims for Payment and/or EOT	<p>The first paragraph is replaced with:</p> <p>“If either Party considers that it is entitled to claim under Sub-Clause 20.1 (a) or (b), the following claim procedure shall apply:”</p>
Sub-Clause 21.1 Constitution of the DAAB	<p>First paragraph: the second sentence is replaced with: “The Parties shall jointly appoint the member(s) of the DAAB within 42 days after the Commencement Date, unless stated otherwise in the Contract Data.”</p> <p>In the second paragraph, at the end of the first sentence after deleting: “.”, the following is added: “, each of whom shall meet the criteria set forth in Sub-Clause 3.3 of Appendix- General Conditions of Dispute Avoidance/ Adjudication Agreement.”</p> <p>After the second paragraph insert the following paragraph: “If the Contract is with a foreign Contractor, the third member (Chairman) of DAAB shall not have the same nationality as the Employer or the Contractor.”</p>
Sub-Clause 21.2 Failure to Appoint DAAB Member(s)	For both (a) and (b): “by the date stated in the first paragraph of Sub-Clause 21.1 [Constitution of the DAAB]” is replaced with: “within forty-two (42) days from the date the Contract is signed by both Parties”
Sub-Clause 21.4.3 The DAAB’s decision	<p>Item (i) of penultimate paragraph is deleted and replaced as follows:</p> <p>(i) subject to sub-paragraph (ii) below, this amount shall be due and payable in the next Payment Certificate, for which the Engineer is obliged to certify, and the Employer is obliged to make payment; and</p>
Sub-Clause 21.6 Arbitration	<p>In the first paragraph, delete starting from: “international arbitration” up to the end of (c), and replace with the following:</p> <p>“Arbitration shall be conducted as follows:</p> <p>(a) if the contract is with foreign contractors, unless otherwise specified in the Contract Data; the dispute shall be finally settled under the Rules of Arbitration of the International Chamber of Commerce; by one or three arbitrators appointed in accordance with these Rules. The place of arbitration shall be the neutral location specified in the Contract Data; and the arbitration shall be conducted in the ruling language defined in Sub-Clause 1.4 [Law and Language].</p> <p>(b) If the Contract is with domestic contractors, arbitration with proceedings conducted in accordance with the laws of the Employer’s country.”</p>

Appendix- General Conditions of Dispute Avoidance/Adjudication Agreement

Title “General Conditions of Dispute Avoidance/Adjudication Agreement” is replaced with “General Conditions of DAAB Agreement”.

1. Definitions

Sub-Clause 1.2: In both the first and third lines, “DAA Agreement” is replaced with “DAAB Agreement”.

Sub-Clause 1.3:

-In the first line, “Dispute Avoidance/Adjudication Agreement” or “DAA Agreement” means” is replaced with:

“DAAB Agreement” is as defined under the Contract and is”.

- In the first line of subparagraph (c), “DAA Agreement” is replaced with “DAAB Agreement.”

- In subparagraph (c)(ii), “chairman” is replaced with “chairperson.”

Sub-Clause 1.3 “DAAB Activities” is replaced with Sub-Clause 1.4 “DAAB Activities” and the subsequent Sub- Clauses under Clause 1 “Definitions” renumbered:

Sub-Clause 1.7 to 12: Replace all instances of “DAA Agreement” with “DAAB Agreement”.

In Sub-Clause 1.8 a(i):” authorized representative of the contractor or of the Employer” is replaced with: “Contractor’s Representative or authorized representative of the Employer”.

2. Warranties

Sub-Clause 3.3 is deleted and replaced with the following:

“When appointing the DAAB Member, each Party relies on the DAAB Member’s representations, that he/she;

- a) has at least a bachelor’s degree in relevant disciplines such as law, engineering, construction management or contract management;
- b) has at least 10 years of experience in contract administration/management and dispute resolution, out of which at least five years of experience as an arbitrator or adjudicator in construction-related disputes;
- c) has received formal training as an adjudicator from an internationally recognized organization;
- d) has experience and/or is knowledgeable in the type of work which the Contractor is to carry out under the Contract;
- e) has experience in the interpretation of construction and/or engineering contract documents;
- f) has familiarity with the forms of contract published by FIDIC since 1999, and an understanding of the dispute resolution procedures contained therein; and
- g) is fluent in the language for communications stated in the Contract Data (or the language as agreed between the Parties and the DAAB).”

3. Confidentiality

In Sub-Clause 7.3: “or” is deleted after subparagraph (b), and the following added:

“or (d) is being provided to the Bank.”

4. Fees and Expenses

In Sub-Clause 9.1 (c): “business class or equivalent” is replaced with: “in less than first class”.

In Sub-Clause 9.4: “and air fares” and “other” are deleted from the first and second sentences respectively.

5. Resignation and Termination

In Sub-Clause 10.3: “the DAA Agreement” is replaced with: “a DAAB member’s DAAB Agreement.”

Annex- DAAB Procedural Rules

Rule 4.2 On the fourth line, “chairman” is replaced with “chairperson”.

Rule 8.3 On the sixth line, “chairman” is replaced with “chairperson”.

Form of Dispute Avoidance/Adjudication Agreement

All instances of “DAA Agreement” are replaced with: “DAAB Agreement.”

In C (b): “chairman” is replaced with “chairperson.”

Particular Conditions of Contract (PCC)

Part C – Prohibited Practices

1. The Bank requires that the Recipient (and all other beneficiaries of the Bank financing), as well as tenderers, suppliers, contractors, concessionaires and consultants under Bank-financed contracts for the Project, observe the highest standard of transparency and integrity during the procurement, execution and implementation of such contracts.
2. Definitions. In pursuance of this policy, the Bank defines the terms set forth below as Prohibited Practices:
 - a) **“Coercive practice”** means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of a party to influence improperly the actions of a party.
 - b) **“Collusive practice”** means an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party.
 - c) **“Corrupt practice”** means the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party.
 - d) **“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.
 - e) **“Misuse of resources”** means improper use of the Bank’s resources, carried out either intentionally or through reckless disregard.
 - f) **“Obstructive practice”** means any of the following practices: (i) deliberately destroying, falsifying, altering or concealing of evidence material to a Bank investigation; (ii) making false statements to investigators in order to materially impede a Bank investigation into allegations of a Prohibited Practice; (iii) failing to comply with requests to provide information, documents or records in connection with a Bank investigation; (iv) threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to a Bank investigation or from pursuing the investigation or (v) materially impeding the exercise of the Bank’s contractual rights of audit or inspection or access to information.
 - g) **“Theft”** means the misappropriation of property belonging to another party.
3. Any occurrence, or suspected occurrence, of a Prohibited Practice in the procurement, award, or implementation of a Bank-financed contract is dealt with in accordance with the provisions of the Bank’s Policy on Prohibited Practices. Suppliers, contractors, service providers and consultants selected pursuant to the provisions of Section 2 and concessionaires selected pursuant to Section 5 of the Bank’s Procurement Instructions for Recipients, as well as the Recipient shall fully cooperate with the Bank (or a cofinancier undertaking an investigation pursuant to Section 2.7 of the Bank’s Procurement Instructions for Recipients) in any investigation into an alleged Prohibited Practice to be carried out pursuant to the Policy on Prohibited Practices, and permit the Bank or its representative (including such cofinancier) to inspect such of their accounts and records

as may be relevant for such investigation and to have such records and accounts audited by the auditors appointed by the Bank.

4. Provisions to this effect are included in the Legal Agreements and the procurement contracts with such entities.
5. If the Project is financed by a sovereign-backed loan, the Bank (or, where relevant, a cofinancier having undertaken an investigation pursuant to Section 2.7 of the Bank's Procurement Instructions for Recipients):

- (a) may take any of the following additional actions in connection with a Prohibited Practice under the Project:

- reject a proposal for award if it determines that the tenderer recommended for award, or any of its personnel, or its agents, or its sub-consultants, subcontractors, service providers, suppliers or their employees, has, directly or indirectly, engaged in a prohibited practice in competing for the contract in question; and
- cancel the undisbursed portion of the loan allocated to a contract (and require reimbursement of the disbursed portion of the loan allocated to the contract) if it determines at any time that representatives of the Recipient or of a recipient of any part of the proceeds of the loan engaged in a prohibited practice during the procurement, administration or implementation of the contract in question; and

- (b) requires that a clause be included in tender documents and in contracts financed by the Bank loan, requiring tenderers, suppliers and contractors and their subcontractors, agents, personnel, consultants, service providers or suppliers, to permit the Bank (and a cofinancier undertaking an investigation pursuant to Section 2.7 of the Bank's Procurement Instructions for Recipients) to inspect all accounts, records and other documents relating to the submission of tenders and contract performance, and to have them audited by auditors appointed by the Bank.

6. Prohibited Practices – ESHS Compliance

(a) Environmental

- Discharge of untreated wastewater, oil, bitumen, or chemicals to land or water body (Rivers, canals, drains, groundwater, or agricultural land)
- Operation of plants/quarries without environmental approvals
- Use of unapproved borrow areas or material sources
- Improper storage of fuel/chemicals without bunding/containment or spill control
- Open burning or illegal dumping of waste
- Excessive dust, noise, or emissions without mitigation
- Unauthorized vegetation clearing or ROW encroachment

(b) Occupational Health & Safety

- Working without required PPE or safety training

-
- Unsafe work at heights, confined spaces, or live traffic
 - Operation of unsafe or poorly maintained equipment
 - Alcohol or drug use at the workplace
 - Failure to provide first aid and emergency response

(c) Community Health & Safety

- Unsafe construction traffic or lack of traffic management
- Blocking community access without alternatives or notice
- Unprotected excavations or hazards
- Damage to utilities without restoration
- Harassment or intimidation of communities

(d) Labor & Social

- Child, forced, or bonded labor
- Discrimination or sexual harassment / GBV
- Withholding wages, contracts, or worker documents
- Obstruction of worker grievance mechanisms

(e) Cultural Heritage

- Damage to cultural or religious sites
- Continuing work after chance finds without approval

Particular Conditions of Contract (PCC)

Part D - Environmental, Social, Health and Safety (ESHS)

Metrics for Progress Reports

Metrics for regular reporting:

- a. Induction of ESHS staff, their orientation training and working procedures.
- b. Environmental incidents or noncompliance with contract requirements, including contamination, pollution or damage to ground or water supplies.
- c. Health and safety incidents, accidents, injuries and all fatalities that require treatment.
- d. Interactions with regulators: identify agency, dates, subjects, outcomes (report the negative if none);
- e. Status of all permits and agreements:
 - (i) Work permits: number required, number received, actions taken for those not received.
 - (ii) Status of permits and consents:
 - List areas/facilities with permits required (quarries, asphalt and batch plants), 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 in the reporting period and highlights of environmental and social protection (land clearing, boundary marking, topsoil salvage, traffic management, decommissioning planning, decommissioning implementation).
 - For quarries: status of relocation and compensation (completed, or details of activities and current status in the reporting period).
- f. Health and safety supervision:
 - i. Safety officer: number days worked, number of full inspections and partial inspections, reports to construction/project management.
 - ii. 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).
- g. Worker accommodations:
 - i. number of expatriates housed in accommodations, number of locals;
 - ii. 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.;
 - iii. actions taken to recommend/require improved conditions, or to improve conditions.
- h. Health services: 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).

-
- i. 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).
 - j. Training:
 - i. Number of new workers, number receiving induction training, dates of induction training.
 - ii. Number and dates of toolbox talks, number of workers receiving Occupational Health and Safety (OHS), environmental and social training.
 - iii. Number and dates of communicable diseases sensitization and/or training, number of workers receiving training (in the reporting period and in the past); same questions for gender sensitization, flag person training.
 - iv. Number and date of SEA/SH prevention sensitization and/or training, number of workers receiving training on Code of Conduct for Contractor's Personnel (in the reporting period and in the past), etc.
 - k. Environmental and social supervision:
 - i. Environmentalist: days worked, areas inspected and numbers of inspections of each (road section, work camp, accommodations, quarries, borrow areas, spoil areas, swamps, etc.), highlights of activities/findings (including violations of environmental and/or social best practices, actions taken), reports to environmental and/or social specialist/construction/site management.
 - ii. 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), reports to environmental and/or social specialist/construction/site management; and

Community liaison person(s): days worked (hours community center open), number of people met, highlights of activities (issues raised, etc.), reports to environmental and/or social specialist /construction/site management.
 - l. Grievances: list new grievances (e.g., allegations of SEAH) received in the reporting period 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):
 - i. Worker grievances.
 - ii. Community grievances.
 - m. Traffic and vehicles/equipment:
 - i. Traffic accidents involving project vehicles and equipment: provide date, location, damage, cause, follow-up.
 - ii. Accidents involving non-project vehicles or property (also reported under immediate metrics): provide date, location, damage, cause, follow-up.
 - iii. 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.).
 - n. Environmental mitigations and issues (what have been done):

Dust: number of working bowsers, number of watering per day, number of complaints, warnings given by environmentalist, actions taken to resolve; highlights of quarry dust control (covers, sprays, operational status); percentage of rock/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 in the reporting period at each, and highlights of environmental and social protection: land clearing, boundary marking, topsoil salvage, traffic management, decommissioning planning, decommissioning implementation.

Spill cleanups, 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 in the reporting period.

Details of water and swamp protection mitigations required undertaken in the reporting period.

E&S compliance and effect monitoring for all 17 parameters as identified in ESIA/ESMP.

Any other specific mitigation measures against the identified impacts mentioned in ESIA/ESMP. The Lot wise ESMPs are attached as

o. Compliance:

- i. 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.
- ii. Compliance status of C-ESMP/ESIP requirements: statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance. Progress on C-ESMP action, upcoming risks and planned mitigation, status of sub-plan implementation.
- iii. Compliance status of SEAH prevention and response action plan: statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance.
- iv. Compliance status of OCHSMP: statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance. Progress on OCHSMP action, upcoming risks and planned mitigation, status of sub-plan implementation. Lost time injury frequency rate, total recordable incidents, near-miss report, inspection summary, PPEs data (use, dispose and added), fire extinguisher details, emergency drills and training record, TBT record, etc.
- v. Compliance status of LMP, SEP and other E&S instruments: statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance.
- vi. Compliance Status of Social Performance: GRM (No. of Grievance received, resolved, pending, categorized by type i.e. labor, community SEA/SH/GBV, community engagement activities as per SEP, labor management activities as per LMP including work force gender inclusive, etc.
- vii. Other unresolved issues from previous reporting periods related to environmental and social: continued violations, continued failure of equipment, continued lack of vehicle covers, spills not dealt with, continued compensation issues, etc. Cross-reference other sections as needed.

Reporting and Documentation:

Contractor will prepare two separate monthly reports by 5th day of each month, one for Environmental and Social Management and the second one for OHS Management.

-
- **Incident Report:** Contractors shall present all incident information in the monthly report including property and environmental damages. For fatal and high potential incidents, a flash report must be submitted within 24 hours to the PIU-HQ and a detail investigation report within 7 days of the incident. All fatal incidents and high potential incidents require a root-cause analysis conducted by either ICAM or TAPROOT™.
 - **Contractor Monthly Report:** Implementation schedule of the mitigation plans and safety inspections and preventive controls suggested in the ESIA/ESMP shall be reported in all monthly reports. The outcome of the field inspections and audits shall be reported in all monthly report. Contractors shall present the implementation schedule of mitigation measures and preventive actions in all monthly report along with monitoring and auditing and CSC shall confirm the status of mitigation and preventive measures claimed by the Contractor. Contractor will also share the consolidated quarterly progress report on ESHS. The monthly and quarterly report will cover but not limited to the following:
 - Environmental Data: monitoring results, waste disposal and management, site clearance details including cutting of trees and their status as per Section 7,
 - OHS data: lost time injury frequency rate, total recordable incidents, near-miss report, inspection summary, PPEs data (use, dispose and added), fire extinguisher details, emergency drills and training record, TBT record, etc.
 - Compliance status: progress and actions against approved C-ESMP, OCHSMP, sub-plans, LMP, SEP, and other E&S instruments
 - Social Performance: GRM (No. of Grievances received, resolved, pending, categorized by type i.e. labor, community SEA/SH/GBV, community engagement activities record as per SEP, labor management activities as per LMP including work force gender inclusive, etc.

Completion Reports on Environment, Health and Safety: The environmental, Social, Health and Safety monitoring reports will include environmental and social mitigation measures and preventive actions undertaken, environmental and social monitoring activities conducted, details of monitoring data collected, analysis of monitoring results particularly the non-compliances, recommended mitigation and corrective measures, GRM data, ESHS training conducted, and environmental and OHS regulatory violations observed.

Section 10: Contract Forms

This section contains forms which, once completed, will form part of the Contract. The forms for Performance Security, Advance Payment Guarantee and Retention Money Security, when required, shall only be completed by the successful Tenderer after contract award.

Table of Forms

Notification of Intention to Award	390
Beneficial Ownership Disclosure Form	394
Letter of Acceptance	396
Contract Agreement.....	397
Performance Security	399
Advance Payment Security	400
Retention Money Security	402

Notification of Intention to Award

[date of notification]

[This Notification of Intention to Award shall be sent to each Tenderer that submitted a Tender.]

[Send this Notification to the Tenderer's Authorized Representative named in the Tenderer Information Form]

For the attention of Tenderer's Authorized Representative

Name: *[insert Authorized Representative's name]*

Address: *[insert Authorized Representative's Address]*

Telephone/Fax numbers: *[insert Authorized Representative's telephone/fax numbers]*

Email Address: *[insert Authorized Representative's email address]*

[IMPORTANT: insert below the date that this Notification is transmitted to Tenderers. The Notification must be sent to all Tenderers simultaneously. This means on the same date and as close to the same time as possible.]

DATE OF TRANSMISSION: This Notification is sent by: *[email/fax]* on *[date]* (local time)

Notification of Intention to Award

Employer: *[insert the name of the Employer]*

Project: *[insert name of project]*

Country: *[insert country where Tender is issued]*

Loan No.: *[insert reference number for loan]*

Tender No.: *[insert Tender reference number from Procurement Plan]*

Contract Title: *[insert the name of the contract]*

This Notification of Intention to Award (Notification) notifies you of our decision to award the above contract. The transmission of this Notification begins the Standstill Period. During the Standstill Period you may:

- (a) request a debriefing in relation to the evaluation of your Tender, and/or
- (b) submit a Procurement-Related Complaint in relation to the decision to award the contract.

1. The successful Tenderer

Name:	<i>[insert name of successful Tenderer]</i>
Address:	<i>[insert address of the successful Tenderer]</i>

Contract Price:	<i>[insert contract price of the successful Tender]</i>
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2. List of all Tenderers *[INSTRUCTIONS: insert names of all Tenderers that submitted a Tender including the successful Tenderer, together with the corresponding Tender price as read out at tender opening and the evaluated Tender price (when rated criteria are not used).]*

Name of Tenderer	Tender Price	Evaluated Tender Price (if applicable)
<i>[insert name]</i>	<i>[insert Tender price]</i>	<i>[insert evaluated price]</i>
<i>[insert name]</i>	<i>[insert Tender price]</i>	<i>[insert evaluated price]</i>
<i>[insert name]</i>	<i>[insert Tender price]</i>	<i>[insert evaluated price]</i>
<i>[insert name]</i>	<i>[insert Tender price]</i>	<i>[insert evaluated price]</i>
<i>[insert name]</i>	<i>[insert Tender price]</i>	<i>[insert evaluated price]</i>

Or

List of all Tenderers *[INSTRUCTIONS: insert names of all Tenderers that submitted a Tender including the successful Tenderer, together with the corresponding Tender price as read out at tender opening and the evaluated Tender price, respective technical and financial scores, combined technical and financial score (when rated criteria are used).]*

Name of Tenderer	Tender Price	Evaluated Tender Price	Technical Score	Financial Score	Combined Score
<i>[insert name]</i>	<i>[insert Tender price]</i>	<i>[insert evaluated price]</i>			
<i>[insert name]</i>	<i>[insert Tender price]</i>	<i>[insert evaluated price]</i>			
<i>[insert name]</i>	<i>[insert Tender price]</i>	<i>[insert evaluated price]</i>			
<i>[insert name]</i>	<i>[insert Tender price]</i>	<i>[insert evaluated price]</i>			
<i>[insert name]</i>	<i>[insert Tender price]</i>	<i>[insert evaluated price]</i>			

3. Reason/s why your Tender was unsuccessful

[INSTRUCTIONS: State the reason/s why this Tenderer's Tender was unsuccessful. Do NOT include: (a) a point-by-point comparison with another Tenderer's Tender, or (b) information that is marked confidential by the Tenderer in its Tender.]

4. How to request a debriefing

DEADLINE: The deadline to request a debriefing expires at midnight on [insert date] (local time).

You may request a debriefing in relation to the results of the evaluation of your Tender. If you decide to request a debriefing your written request must be made within three (3) Business Days of receipt of this Notification of Intention to Award.

Provide the contract name, reference number, name of the Tenderer, contact details; and address the request for debriefing as follows:

Attention: [insert full name of person, if applicable]

Title/position: [insert title/position]

Agency: [insert name of Employer]

Email address: [insert email address]

Fax number: [insert fax number] **delete if not used**

If your request for a debriefing is received within the three (3)-Business Day deadline, we will provide the debriefing within five (5) Business Days of receipt of your request. If we are unable to provide the debriefing within this period, the Standstill Period shall be extended by five (5) Business Days after the date that the debriefing is provided. If this happens, we will notify you and confirm the date that the extended Standstill Period will end.

The debriefing may be in writing, by phone, video conference call or in person. We shall promptly advise you in writing how the debriefing will take place and confirm the date and time.

If the deadline to request a debriefing has expired, you may still request a debriefing. In this case, we will provide the debriefing as soon as practicable, and normally no later than fifteen (15) Business Days from the date of publication of the Contract Award Notice.

5. How to make a complaint

Period: Procurement-Related Complaint challenging the decision to award shall be submitted by midnight, [insert date] (local time).

Provide the contract name, reference number, name of the Tenderer, contact details; and address the Procurement-Related Complaint as follows:

Attention: [insert full name of person, if applicable]

Title/position: [insert title/position]

Agency: [insert name of Employer]

Email address: *[insert email address]*

Fax number: *[insert fax number]* **delete if not used**

At this point in the procurement process, you may submit a Procurement-Related Complaint challenging the decision to award the contract. You do not need to have requested, or received, a debriefing before making this complaint. Your complaint must be submitted within the Standstill Period and received by us before the Standstill Period ends.

For more information see the DIRECTIVE on Procurement Instructions for Recipients (Annex III. Administration of Procurement Related Complaints).

6. Standstill Period

DEADLINE: The Standstill Period is due to end at midnight on *[insert date]* (local time).

The Standstill Period lasts ten (10) Business Days after the date of transmission of this Notification of Intention to Award.

The Standstill Period may be extended as stated in Section 4 above.

If you have any questions regarding this Notification, please do not hesitate to contact us.

For and on behalf of the Employer:

Signature: _____

Name: _____

Title/Position: _____

Telephone: _____

E-mail: _____

Beneficial Ownership Disclosure Form

Tender No.: *[insert number of Tender process]*

INSTRUCTIONS TO TENDERERS: DELETE THIS BOX ONCE YOU HAVE COMPLETED THE FORM

This Beneficial Ownership Disclosure Form (“Form”) is to be completed by the successful Tenderer.¹ In case of joint venture, the Tenderer must submit a separate Form for each member. The beneficial ownership information to be submitted in this Form shall be current as of the date of its submission.

For the purposes of this Form, a Beneficial Owner of a Tenderer is any natural person who ultimately owns or controls the Tenderer by meeting one or more of the following conditions:

- *directly or indirectly holding 25 percent or more of the shares,*
- *directly or indirectly holding 25 percent or more of the voting rights or*
- *directly or indirectly having the right to appoint a majority of the board of directors or equivalent governing body of the Tenderer.*

To: *[insert complete name of Employer]*

In response to your request in the Letter of Acceptance *dated [insert date of letter of Acceptance]* to furnish additional information on beneficial ownership: *[select one option as applicable and delete the options that are not applicable]*

(i) We hereby provide the following beneficial ownership information.

Details of Beneficial Ownership

Identity of Beneficial Owner	Directly or indirectly holding 25 percent or more of the shares (Yes / No)	Directly or indirectly holding 25 percent or more of the Voting Rights (Yes / No)	Directly or indirectly having the right to appoint a majority of the board of the directors or an equivalent governing body of the Tenderer (Yes / No)
<i>[include full name (last, middle, first), nationality, country of residence]</i>			

OR

(ii) We declare that there is no Beneficial Owner meeting one or more of the following conditions:

- directly or indirectly holding 25 percent or more of the shares,
- directly or indirectly holding 25 percent or more of the voting rights or
- directly or indirectly having the right to appoint a majority of the board of directors or equivalent governing body of the Tenderer.

OR

(iii) We declare that we are unable to identify any Beneficial Owner meeting one or more of the following conditions. [If this option is selected, the Tenderer shall provide explanation on why it is unable to identify any Beneficial Owner]

- directly or indirectly holding 25 percent or more of the shares,
- directly or indirectly holding 25 percent or more of the voting rights or
- directly or indirectly having the right to appoint a majority of the board of directors or equivalent governing body of the Tenderer.

2.

Name of the Tenderer: *[insert complete name of the Tenderer] _____

Name of the person duly authorized to sign the Tender on behalf of the Tenderer:

**[insert complete name of person duly authorized to sign the Tender]

Title of the person signing the Tender: [insert complete title of the person signing the Tender]

Signature of the person named above: [insert signature of person whose name and capacity are shown above]

Date signed [insert date of signing] day of [insert month], [insert year]

* In the case of the Tender submitted by a Joint Venture specify the name of the Joint Venture as Tenderer. In the event that the Tenderer is a joint venture, each reference to "Tenderer" in the Beneficial Ownership Disclosure Form (including this Introduction thereto) shall be read to refer to the joint venture member.

** Person signing the Tender shall have the power of attorney given by the Tenderer. The power of attorney shall be attached with the Tender Schedules.

Letter of Acceptance

[letterhead paper of the Employer]

[date]

To: *[name and address of the Contractor]*

This is to notify you that your Tender dated *[date]* for execution of the *[name of the Contract and identification number, as given in the Contract Data]* for the Accepted Contract Amount *[amount in numbers and words] [name of currency]*, as corrected and modified in accordance with the Instructions to Tenderers, is hereby accepted by our Agency.

You are requested to furnish (i) the Performance Security within twenty-eight (28) days in accordance with the Conditions of Contract, using, for that purpose, the Performance Security Form; and (ii) the additional information on beneficial ownership in accordance with **TDS ITT 49.1**, within eight (8) Business days using the Beneficial Ownership Disclosure Form, included in Section 10, Contract Forms, of the Tender Document.

Authorized Signature:

Name and Title of Signatory:

Name of Agency:

Attachment: Contract Agreement

Contract Agreement

THIS AGREEMENT made the _____ day of _____, _____, between _____ of _____ *[insert complete name of Employer and full business address]* (hereinafter “the Employer”), of the one part, and _____ of _____ *[insert complete name and nationality of Contractor as well as full business address]* (hereinafter “the Contractor”), of the other part:

WHEREAS the Employer invited tenders for the execution of the Works, described as _____ *[insert brief description of the Works]*, and has accepted a Tender by the Contractor for the execution and completion of these Works and the remedying of any defects therein.

The Employer and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.
 - (a) the Letter of Acceptance;
 - (b) the Letter of Tender;
 - (c) the addenda Nos _____ (if any);
 - (d) the Particular Conditions of Contract;
 - (e) the General Conditions of Contract;
 - (f) the Specification;
 - (g) the Drawings; and
 - (h) the completed Schedules and any other documents forming part of the contract, including, but not limited to:
 - i. the ESHS Management Strategies and Implementation Plans and
 - ii. Code of Conduct (ESHs).
3. In consideration of the payments to be made by the Employer to the Contractor as specified in this Agreement, the Contractor hereby covenants with the Employer to execute the Works and to remedy defects therein in conformity 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 and the remedying of defects therein, 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 in accordance with the laws of _____ *[insert the name of the Contract governing law country]* on the day, month and year specified above.

For and on behalf of the Employer

Signed: *[insert signature]*

in the capacity of *[insert title or other appropriate designation]*

In the presence of *[insert identification of official witness]*

For and on behalf of the Contractor

Signed: *[insert signature of authorized representative(s) of the Contractor]*

in the capacity of *[insert title or other appropriate designation]*

in the presence of *[insert identification of official witness]*

Performance Security

[Bank's name, and address of issuing branch or office]¹²

Demand Guarantee

[Guarantor letterhead or SWIFT identifier code]

Beneficiary: [insert name and Address of Employer]

Date: _____ [Insert date of issue]

PERFORMANCE GUARANTEE No.: _____

Guarantor: [Insert name and address of place of issue, unless indicated in the letterhead]

We have been informed that _____ (hereinafter called "the Applicant") has entered into Contract No. _____ dated _____ with the Beneficiary, for the execution of _____ (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ (),¹ such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire, no later than the Day of, 2...², and any demand for payment under it must be received by us at this office indicated above on or before that date. This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

[signature(s)]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

¹² All italicized text is for guidance on how to prepare this demand guarantee and shall be deleted from the final document.

¹ *The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance, less provisional sums, if any, and denominated either in the currency(cies) of the Contract or a freely convertible currency acceptable to the Beneficiary.*

² *Insert the date twenty-eight (28) days after the expected completion date as described in GCC Clause 11.9. The Employer should note that in the event of an extension of this date for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months] [one year], in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."*

Advance Payment Security

[Guarantor letterhead or SWIFT identifier code]

[Guarantor letterhead or SWIFT identifier code]

Beneficiary: _____ *[Insert name and Address of Employer]*

Date: _____ *[Insert date of issue]*

ADVANCE PAYMENT GUARANTEE No.: *[Insert guarantee reference number]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that _____ (hereinafter called "the Applicant") has entered into Contract No. _____ dated _____ with the Beneficiary, for the execution of _____ (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum _____ () is to be made against an advance payment guarantee.

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ (¹) upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating either that the Applicant:

- has used the advance payment for purposes other than the costs of mobilization in respect of the Works; or
- has failed to repay the advance payment in accordance with the Contract conditions, specifying the amount which the Applicant has failed to repay.

A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Beneficiary's bank stating that the advance payment referred to above has been credited to the Applicant on its account number _____ at _____..

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Applicant as specified in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate indicating that ninety (90) percent of the Accepted Contract Amount, less provisional sums, has been certified for payment, or

¹ *The Guarantor shall insert an amount representing the amount of the advance payment and denominated either in the currency(ies) of the advance payment as specified in the Contract, or in a freely convertible currency acceptable to the Employer.*

on the ___ day of _____, 2___,² whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

[signature(s)]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

² *Insert the expected expiration date of the Time for Completion. The Employer should note that in the event of an extension of the time for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months] [one year], in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."*

Retention Money Security

Demand Guarantee

_____ [Guarantor letterhead or SWIFT identifier code]

Beneficiary: _____ [Insert name and Address of Employer]

Date: _____ [Insert date of issue]

RETENTION MONEY GUARANTEE No.: [Insert guarantee reference number]

Guarantor: [Insert name and address of place of issue, unless indicated in the letterhead]

We have been informed that _____ [insert name of Contractor, which in the case of a joint venture shall be the name of the joint venture] (hereinafter called "the Applicant") has entered into Contract No. _____ [insert reference number of the contract] dated _____ with the Beneficiary, for the execution of _____ [insert name of contract and brief description of Works] (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, the Beneficiary retains moneys up to the limit set forth in the Contract ("the Retention Money"), and that when the Taking-Over Certificate has been issued under the Contract and the first half of the Retention Money has been certified for payment, payment of [insert the second half of the Retention Money or if the amount guaranteed under the Performance Guarantee when the Taking-Over Certificate is issued is less than half of the Retention Money, the difference between half of the Retention Money and the amount guaranteed under the Performance Security is to be made against a Retention Money guarantee.

At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ [insert amount in figures]()[amount in words]¹ upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without your needing to prove or show grounds for your demand or the sum specified therein.

.....
[Signature(s) and seal of bank (where appropriate)]

A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Beneficiary's bank stating that the second half of the Retention Money as referred to above has been credited to the Applicant on its account number _____ at _____ [insert name and address of Applicant's bank].

This guarantee shall expire no later than the ... Day of, 2...² and any demand for payment under it must be received by us at the office indicated above on or before that date.

¹ The Guarantor shall insert an amount representing the amount of the second half of the Retention Money or if the amount guaranteed under the Performance Guarantee when the Taking-Over Certificate is issued is less than half of the Retention Money, the difference between half of the Retention Money and the amount guaranteed under the Performance Security and denominated either in the currency(ies) of the second half of the Retention Money as specified in the Contract, or in a freely convertible currency acceptable to the Beneficiary.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

[signature(s)]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

² *Insert the same expiry date as set forth in the performance security, representing the date twenty-eight (28) days after the completion date described in GCC Clause 11.9. The Employer should note that in the event of an extension of this date for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months] [one year], in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."*

