Government of Nepal

Ministry of Physical Infrastructure and Transport

Department of Roads

Development Cooperation Implementation Division

Kathmandu, Nepal

Strategic Road Connectivity & Trade Improvement Project

(WB Credit No.6673 –NP and 6674-NP)

Upgrading of Mahendra Highway
Kamala-Dhalkebar- Bagmati Road Section
(Km 238+030 to km 312+785)

Contract No.: SRCTIP-DOR-W-KDP-ICB-4 (Comprising Lots 1, 2 and 3)

Phase 1 Upgrading Works: (Upgrading of existing road from 2-Lanes to 4 Lanes and Service Lanes, Structures, Bridges, etc. including Defect Notification Period)

Phase 2: Performance Based Maintenance Works

(Maintenance works consisting of all activities to be carried out to achieve and keep the road assets as defined in the PBM Specifications)

Bidding Document
For
Lot 3 (Km 289+840 to Km 312+785)

Part 1 Bidding Procedures

Section I -	**Instructions to Bidders (ITB)**
Section II -	**Bid Data Sheet (BDS)**
Section III -	**Evaluation and Qualification Criteria**
Section IV -	**Bidding Forms**
Section V -	**Eligible Countries**
Section VI -	**Fraud and Corruption**

March 2024

Request for Bids Works
(Without Prequalification)

Upgrading of Mahendra Highway
Kamala-Dhalkebar- Bagmati Road Section
(Km 238+030 to km 312+785)

Contract Identification No. **SRCTIP-DOR-W-KDP-ICB-4 (Lot 1, 2 and 3)**

Lot 3 (Km 289+840 to Km 312+785)

Preface

This Bidding Document for the Procurement of Works (Request for Bid, Works – Without Prequalification) has been prepared by the Government of Nepal, Ministry of Physical Infrastructure and Transport, Department of Roads, Development Cooperation Implementation Division and is based on the Standard Procurement Document Request for Bids (Without Prequalification and Where Bank's disqualification mechanism for non-compliance with SEA/SH obligations Does Not Apply)" issued by the World Bank dated January 2021.

WB's SPD Works has the structure and the provisions of the Master Procurement Document entitled "Bidding Documents for the Procurement of Works", which form part of the "Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer ("Red book") Second edition 2017" published by the Federation Internationale Des Ingenieurs – Conseils (FIDIC) and the following "Particular Conditions" except where WB-specific considerations have required a change.

Standard Procurement Document
Summary

Specific Procurement Notice - Request for Bids (RFB)

Bidding Document: Request for Bids – Works (Without Prequalification)

PART 1 – BIDDING PROCEDURES

Section I - Instructions to Bidders (ITB)

This Section provides relevant information to help Bidders prepare their Bids. It is based on a one-envelope Bidding process when prequalification has not taken place. Information is also provided on the submission, opening, and evaluation of Bids and on *the award of Contracts. **Section I contains provisions that are to be used without modification.**

Section II - Bid Data Sheet (BDS)

This Section includes provisions that are specific to each procurement and that supplement Section I, Instructions to Bidders.

Section III - Evaluation and Qualification Criteria

This Section specifies the criteria to determine the Most Advantageous Bid.

Section IV - Bidding Forms

This Section includes the forms for the Bid submission, Bill of Quantities, Schedules of Technical Proposal, including technical and financial qualifications, personnel, financial resources, and equipment, Bid Security and others to be completed and submitted by the Bidder as part of its Bid.

Section V - Eligible Countries

This Section contains information regarding eligible countries.

Section VI - Fraud and Corruption

This section includes the Fraud and Corruption provisions which apply to this Bidding process.

PART 2 – WORKS' REQUIREMENTS

Section VII - Works' Requirements

This Section specifies the Scope of Works, Specification, the Drawings, and supplementary information that constitute the Works' Requirements for the Works to be procured. The Works' Requirements also include the environmental and social (E&S) requirements

(including requirements relating to Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) which are to be satisfied by the Contractor in executing the Works.

Section: VII A Standard Specifications
Section: VII B Special Provisions to Standard Specifications
Section: VII C Environmental and Social Management Plan (ESMP)
Section: VII D Drawings (In Separate Volume)
Section: VII E Supplementary Information Regarding Work to be Procured
Section: VII F Personnel Requirements
Section: VII G Equipment Requirements

PART 3 – CONDITIONS OF CONTRACT AND CONTRACT FORMS

Section VIII - General Conditions (GC)

This Section refers to the "General Conditions" which form part of the Conditions of Contract for Construction (Second Edition 2017) published by the Federation Internationale Des Ingénieurs Conseils (FIDIC).

Section IX - Particular Conditions (PC)

This Section includes particular conditions of the contract consisting of: Part A- Contract Data; Part B -Special Provisions, PART C – Fraud and Corruption; and PART D – Environmental and Social (E&S) Compliance Reporting Metrics for Progress Reports. The contents of this Section supplement the General Conditions and shall be completed by the Employer.

Section X - Contract Forms

This Section contains the Letter of Acceptance, Contract Agreement and other relevant forms.

Notice of Request for Bids
Request for Bids
Works
(Without Prequalification)

Employer: Department of Roads, Development Cooperation Implementation Division, Strategic Road Connectivity & Trade Improvement Project
Project: Strategic Road Connectivity & Trade Improvement Project
Contract title: *Upgrading of Mahendra Highway - Kamala-Dhalkebar- Bagmati Road Section and bridges (Km 238+030 to km 312+785)*
Country: Nepal
Credit No.: IDA-6673-NP and 6674-NP
RFB Nos: SRCTIP-DOR-W-KDP-ICB-4(Lot 1,2 and 3)
Issued on: 25th March 2024

1. The Government of Nepal, Ministry of Physical Infrastructure and Transport, Department of Roads has received financing from the World Bank toward the cost of the Strategic Road Connectivity & Trade Improvement Project, and intends to apply part of the proceeds toward payments under the contracts for Upgrading/Construction of following Works:

SRCTIP-DOR-W-KDP-ICB-4 (Lot 1, 2 and 3): Upgrading of Mahendra Highway : Kamala -Dhalkebar-Bagmati Road Section and bridges (Km 238+030 to km 312+785) divided in 3 Road Sections as listed below in different 3 Lots.

Lot No. and Contract Identification No.	Contract Description	Cost of Bid Documents **(Each Lot)**	Bid Security Amount **(Each Lot)**
SRCTIP-DOR-W-KDP-ICB-4 (Lot 1)	Lot 1: Km 238+030to km 260+100	NPR 20,000.00 or equivalent (* Excluding bank commissions)	USD 1.4 million
SRCTIP-DOR-W-KDP-ICB-4(Lot 2)	Lot 2: Km 260+100 to Km 289+840		USD 1.6 million
SRCTIP-DOR-W-KDP-ICB-4(Lot 3)	Lot 3: Km 289+840 to Km 312+785		USD 1.6 million

2. The Department of Roads, Development Cooperation Implementation Division, Strategic Road Connectivity & Trade Improvement Project now invites sealed Bids from the eligible bidders for the above contracts. The bidders are allowed to obtained bidding documents and bid for any one lot or combinations of lots as they prefer. However, eligibility and qualification of the bidders shall be assessed in accordance with the Qualification and Evaluation Criteria as detailed in Bidding Document. The works mainly consists in two phase:

Phase 1 Upgrading Works:
(Upgrading of existing road from 2-Lanes to
4 Lanes and Service Lanes, Structures, Bridges, etc. including Defect Notification Period)
Phase 2: Performance Based Maintenance Works
(Maintenance works consisting of all activities to be carried out to achieve and keep the road assets as defined in the PBM Specifications)

3. Bidding will be conducted through international competitive procurement using Request for Bids (RFB) as specified in the World Bank's "Procurement Regulations for IPF Borrowers- Fifth Edition September 2023" ("Procurement Regulations"), and is open to all eligible Bidders as defined in the Procurement Regulations.

4. Interested eligible Bidders may obtain further information from Department of Roads, Development Cooperation Implementation Division, Strategic Road Connectivity & Trade Improvement Project , Babarmahal, Kathmandu, email: *dorfcb@dor.gov.np* and inspect the bidding document during office hours at the address given below.

5. The bidding document in English may be purchased by eligible Bidders upon the submission of a written application to the address below and upon payment of a nonrefundable fee of NPR 20,000.00 or equivalent for each lots. The method of payment will be direct deposit to following account:

   Name of the Bank: Rastriya Banijya Bank, Teku, Kathmandu
   Name of Office: Road Sector Development Project, Babarmahal, Kathmandu
   Office Code No.: 337013511
   Office Account No. 1000200010000
   Rajaswa (revenue) Shirshak No. 14229

   Swift Code: RBBANPKA.

6. The bidding document may be downloaded from Department of Roads website: *www.dor.gov.np* or Public Procurement Monitoring Office website: *www.bolpatra.gov.np/egp*

7. Bidder may submit the Bid in **hard copy** or **electronically**.

8. Bids must be delivered to the address below on or before **12:00 hours (Nepal Standard Time), 10th May 2024.** For electronic bid submission, the bidder may inspect and or submit the bids by visiting electronic procurement portal *http://www.bolpatra.gov.np* of Public Procurement Monitoring Office (PPMO) of Government of Nepal. Bidders who choose to submit their bid electronically shall deposit the fee of bidding document in the revenue account given above and the scanned copy of the bank deposit voucher shall be uploaded at the time of e-bid submission. For e-submission, the bidder is required to register in the e-GP portal *https://www.bolpatra.gov.np* for downloading and submitting the bid electronically. Late Bids will be rejected. Bids will be publicly opened in the presence of the Bidders' designated representatives and anyone who chooses to attend at the address below on **13:00 hours (Nepal Standard Time), 10th May 2024.** All Bids must be accompanied by a Bid Security as stated in paragraph 1 above.

9. Attention is drawn to the Procurement Regulations requiring the Borrower to disclose information on the successful bidder's beneficial ownership, as part of the Contract Award Notice, using the Beneficial Ownership Disclosure Form as included in the bidding document.

10. The address referred to above is:

Project Director
Department of Roads
Development Cooperation Implementation Division
Strategic Road Connectivity & Trade Improvement Project
Babarmahal, Kathmandu, Nepal

Tel: +977-1-5903753
E-mail: dorfcb@dor.gov.np
Website: www.dor.gov.np

Request for Bids
Works
(Without Prequalification)

Procurement of:
Upgrading of Mahendra Highway : Kamala-Dhalkebar- Bagmati Road Section and Bridges (Km 238+030to km 312+785)
Contract Identification No.: SRCTIP-DOR-W-KDP-ICB-4 (Lot 1, 2 and 3)

Employer: Department of Roads, Development Cooperation Implementation Division, Strategic Road Connectivity & Trade Improvement Project

Project: Strategic Road Connectivity & Trade Improvement Project
Contract title: *Upgrading of Mahendra Highway - Kamala-Dhalkebar- Bagmati Road Section (Km 238+030to km 312+785)*
Country: Nepal
Credit No.: **IDA-6673-NP and 6674-NP**
RFB No: **SRCTIP-DOR-W-KDP-ICB-4 (Lot 1, 2 and 3)**
Issued on: **25th March 2024**

Standard Procurement Document

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PART 1 – Bidding Procedures

Section I - Instructions to Bidders

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Dr. Bijaya Jaishi
Project Director

Section I - Instructions to Bidders

	A. General
1. Scope of Bid	1.1 In connection with the Specific Procurement Notice – Request for Bids (RFB), specified in the **Bid Data Sheet (BDS)**, the Employer, as specified **in the BDS**, issues this Bidding document for the provision of Works as specified in Section VII, Works' Requirements. The name, identification, and number of lots (contracts) of this RFB are specified **in the BDS.**
	1.2 Throughout this bidding document: the term **"in writing"** means communicated in written form (e.g. by mail, e-mail, fax, including, if specified **in the BDS**, distributed or received through electronic-procurement system used by the Employer) with proof of receipt; if the context so requires, **"singular"** means **"plural'** and vice versa; **"Day"** means calendar day, unless otherwise specified as a **"Business Day."** A **"Business Day"** is any day that is a working day of the Borrower. It excludes the Borrower's official public holidays; **"ES"** means environmental and social (including Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH)); **"Sexual Exploitation and Abuse" "(SEA)"** means 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. **Sexual Abuse** is defined as the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions; **"Sexual Harassment" "(SH)"** is defined as unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature by the Contractor's Personnel with other Contractor's or Employer's Personnel; **"Contractor's Personnel"** is as defined in Sub-Clause 1.1.17 of the General Conditions; and **"Employer's Personnel"** is as defined in Sub-Clause 1.1.33 of the General Conditions. A non-exhaustive list of (i) behaviors which constitute SEA and (ii) behaviors which constitute SH is attached to the Code of Conduct form in Section IV.
2. Source of Funds	2.1 The Borrower or Recipient (hereinafter called "Borrower") specified **in the BDS** has received or has applied for financing (hereinafter called "funds") from the International Bank for Reconstruction and Development or the International Development Association (hereinafter called "the Bank") in an amount specified **in the BDS**, toward the project named **in the BDS**. The Borrower

		intends to apply a portion of the funds to eligible payments under the contract(s) for which this Bidding document is issued.
	2.2	Payment by the Bank will be made only at the request of the Borrower 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 Borrower 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. Fraud and Corruption	3.1	The Bank requires compliance with the Bank's Anti-Corruption Guidelines and its prevailing sanctions policies and procedures as set forth in the WBG's Sanctions Framework, as set forth in Section VI.
	3.2	In further pursuance of this policy, Bidders shall permit and shall cause their agents (where declared or not), subcontractors, sub consultants, service providers, suppliers, and personnel, to permit the Bank to inspect all accounts, records and other documents relating to any initial selection process, prequalification process, bid submission, proposal submission, and contract performance (in the case of award), and to have them audited by auditors appointed by the Bank.
4. Eligible Bidders	4.1	A Bidder may be a firm that is a private entity, a state-owned enterprise or institution subject to 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 Bidding process and, in the event the JV is awarded the Contract, during contract execution. Unless specified **in the BDS**, there is no limit on the number of members in a JV.
	4.2	A Bidder shall not have a conflict of interest. Any Bidder found to have a conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest for the purpose of this Bidding process, if the Bidder: (a) directly or indirectly controls, is controlled by or is under common control with another Bidder; or (b) receives or has received any direct or indirect subsidy from another Bidder; or (c) has the same legal representative as another Bidder; or (d) has a relationship with another Bidder, directly or through common third parties, that puts it in a position to influence the Bid of another Bidder, or influence the decisions of the Employer regarding this Bidding 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 Bid; or (f) or any of its affiliates has been hired (or is proposed to be hired) by the Employer or Borrower 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 BDS ITB 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 Borrower (or of the project implementing agency, or of a recipient of a part of the loan) who: (i) are directly or indirectly involved in the preparation of the Bidding document or specifications of the Contract, and/or the Bid evaluation process of such Contract; or (ii) would be involved in the implementation or supervision of such Contract unless the conflict stemming from such relationship has been resolved in a manner acceptable to the Bank throughout the Bidding process and execution of the Contract.
	4.3 A firm that is a Bidder (either individually or as a JV member) shall not participate in more than one Bid, except for permitted alternative Bids. This includes participation as a subcontractor in other Bids. Such participation shall result in the disqualification of all Bids in which the firm is involved. A firm that is not a Bidder or a JV member may participate as a subcontractor in more than one Bid. 4.4 A Bidder may have the nationality of any country, subject to the restrictions pursuant to ITB 4.8. A Bidder shall be deemed to have the nationality of a country if the Bidder 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 sub consultants for any part of the Contract including related Services.
	4.5 A Bidder that has been sanctioned by the Bank, pursuant to the Bank's Anti-Corruption Guidelines, and in accordance with its prevailing sanctions policies and procedures as set forth in the World Bank Group's Sanctions Framework, as described in Section VI paragraph 2.2 d. shall be ineligible to be prequalified for, initially selected for, bid 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 BDS**.
	4.6 Bidders 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 legally and

	financially autonomous (ii) operate under commercial law, and (iii) are not under supervision of the Employer. 4.7 A Bidder shall not be under suspension from bidding by the Employer as the result of the operation of a Bid–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 Borrower's country prohibits commercial relations with that 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 Borrower's country prohibits any import of goods or contracting of works or services from that 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 Borrower, and is involved in the procurement), then exclusion of a firm or individual on the basis of ITB 4.8 (a) above by any country may be applied to that procurement across other countries involved, if the Bank and the Borrowers involved in the procurement agree. 4.9 A Bidder 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 Borrower from being awarded a contract is eligible to participate in this procurement, unless the Bank, at the Borrower's request, is satisfied that the debarment; (a) relates to fraud or corruption, 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, Bidders may be required to provide evidence of the origin of materials, equipment and services.
	B.Contents of Bidding Document
6. Sections of Bidding Document	6.1 The Bidding document consists of Parts 1, 2, and 3, which includes all the sections specified below, and which should be read in conjunction with any Addenda issued in accordance with ITB 8. **PART 1 Bidding Procedures** • Section I - Instructions to Bidders (ITB) • Section II - Bid Data Sheet (BDS) • Section III - Evaluation and Qualification Criteria • Section IV - Bidding Forms • Section V - Eligible Countries

	• Section VI - Fraud and Corruption **PART 2 Works Requirements** • Section VII - Works' Requirements **PART 3 Conditions of Contract and Contract Forms** • Section VIII - General Conditions (GC) • Section IX - Particular Conditions (PC) • Section X - Contract Forms
	6.2 The Specific Procurement Notice - Request for Bids (RFB) issued by the Employer is not part of the Bidding document.
	6.3 Unless obtained directly from the Employer, the Employer is not responsible for the completeness of the Bidding document, responses to requests for clarification, the minutes of the pre-Bid meeting (if any), or Addenda to the Bidding document in accordance with ITB 8. In case of any contradiction, documents obtained directly from the Employer shall prevail.
	6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding document and to furnish with its Bid all information and documentation as is required by the Bidding document.
7. Clarification of Bidding Document, Site Visit, Pre-Bid Meeting	7.1 A Bidder requiring any clarification of the Bidding document shall contact the Employer in writing at the Employer's address specified **in the BDS** or raise its enquiries during the pre-Bid meeting if provided for in accordance with ITB 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 Bids. The Employer shall forward copies of its response to all Bidders who have acquired the Bidding document in accordance with ITB 6.3, including a description of the inquiry but without identifying its source. If so specified **in the BDS**, the Employer shall also promptly publish its response at the web page identified **in the BDS**. Should the clarification result in changes to the essential elements of the Bidding document, the Employer shall amend the Bidding document following the procedure under ITB 8 and ITB 22.2.
	7.2 The Bidder 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 Bid and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Bidder's own expense.
	7.3 The Bidder 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 Bidder, 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 BDS**, the Bidder's designated representative is invited to attend a pre-Bid 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 Bidder 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-Bid meeting, if applicable, including the text of the questions asked by Bidders, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding document in accordance with ITB 6.3. If so specified **in the BDS,** the Employer shall also promptly publish the Minutes of the pre-Bid meeting at the web page identified **in the BDS**. Any modification to the Bidding document that may become necessary as a result of the pre-Bid meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to ITB 8 and not through the minutes of the pre-Bid meeting. Nonattendance at the pre-Bid meeting will not be a cause for disqualification of a Bidder.
8. Amendment of Bidding Document	8.1	At any time prior to the deadline for submission of Bids, the Employer may amend the Bidding document by issuing addenda.
	8.2	Any addendum issued shall be part of the Bidding document and shall be communicated in writing to all who have obtained the Bidding document from the Employer in accordance with ITB 6.3. The Employer shall also promptly publish the addendum on the Employer's web page in accordance with ITB 7.1.
	8.3	To give Bidders reasonable time in which to take an addendum into account in preparing their Bids, the Employer should extend the deadline for the submission of Bids, pursuant to ITB 22.2.
		C. Preparation of Bids
9. Cost of Bidding	9.1	The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Employer shall not be responsible or liable for those costs, regardless of the conduct or outcome of the Bidding process.
10. Language of Bid	10.1	The Bid, as well as all correspondence and documents relating to the Bid exchanged by the Bidder and the Employer, shall be written in the language specified **in the BDS**. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language specified **in the**

	BDS, in which case, for purposes of interpretation of the Bid, such translation shall govern.
11. Documents Comprising the Bid	11.1 The Bid shall comprise the following: (a) Letter of Bid prepared in accordance with ITB 12; (b) Schedules including priced Bill of Quantities, completed in accordance with ITB 12 and ITB 14; (c) Bid Security or Bid-Securing Declaration, in accordance with ITB 19.1; (d) Alternative Bid, if permissible, in accordance with ITB 13; (e) Authorization: written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 20.3; (f) Qualifications: documentary evidence in accordance with ITB 17 establishing the Bidder's qualifications to perform the Contract if its Bid is accepted; (g) Conformity: a technical proposal in accordance with ITB 16; (h) any other document required in the BDS. 11.2 In addition to the requirements under ITB 11.1, Bids 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 Bid shall be signed by all members and submitted with the Bid, together with a copy of the proposed Agreement. 11.3 The Bidder shall furnish in the Letter of Bid information on commissions and gratuities, if any, paid or to be paid to agents or any other party relating to this Bid. 11.4 The Bidder shall furnish in the Letter of Bid the names of three potential DAAB members and attach their curriculum vitae. The list of potential DAAB members proposed by the Employer (Contract Data 21.1) and by the Bidder (Letter of Bid) shall be subject to Bank's No-objection.
12. Letter of Bid and Schedules	12.1 The Letter of Bid and Schedules, including the Bill of Quantities, shall be prepared using the relevant forms furnished in Section IV, Bidding Forms. The forms must be completed without any alterations to the text, and no substitutes shall be accepted except as provided under ITB 20.3. All blank spaces shall be filled in with the information requested.
13. Alternative Bids	13.1 Unless otherwise specified **in the BDS**, alternative Bids shall not be considered.
	13.2 When alternative times for completion are explicitly invited, a statement to that effect will be included **in the BDS**, 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 ITB 13.4 below, Bidders wishing to offer technical alternatives to the requirements of the Bidding document must first price the Employer's design as described in the Bidding 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 Bidder with the Most Advantageous Bid conforming to the basic technical requirements shall be considered by the Employer.
	13.4 When specified **in the BDS**, Bidders are permitted to submit alternative technical solutions for specified parts of the Works, and such parts will be identified **in the BDS**, as will the method for their evaluating, and described in Section VII, Works' Requirements.
14. Bid Prices and Discounts	14.1 The prices and discounts (including any price reduction) quoted by the Bidder in the Letter of Bid and in the Bill of Quantities shall conform to the requirements specified below. 14.2 The Bidder 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 Bidder 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. An item not listed in the priced Bill of Quantities shall be assumed to be not included in the Bid, and provided that the Bid is determined substantially responsive notwithstanding this omission, the average price of the item quoted by substantially responsive Bidders will be added to the Bid price and the equivalent total cost of the Bid so determined will be used for price comparison.
	14.3 The price to be quoted in the Letter of Bid, in accordance with ITB 12.1, shall be the total price of the Bid, excluding any discounts offered.
	14.4 The Bidder shall quote any discounts and the methodology for their application in the Letter of Bid, in accordance with ITB 12.1.
	14.5 Unless otherwise specified **in the BDS** and the Conditions of Contract, the rates and prices quoted by the Bidder 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 Bidder shall furnish the indices and weightings for the price adjustment formulae in the Table of Adjustment Data and the Employer may require the Bidder to justify its proposed indices and weightings.
	14.6 If, so specified in ITB 1.1, Bids are being invited for individual lots (contracts) or for any combination of lots (packages). Bidders wishing to offer discounts for the award of more than one Contract shall specify in their Bid the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Discounts shall be submitted in accordance with ITB 14.4,

	provided the Bids for all lots (contracts) are opened at the same time. **If, however, rated criteria is used in accordance with ITB 35.2, discounts on condition of award of more than one contract will not be used for Bid 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 28 days prior to the deadline for submission of Bids, shall be included in the rates and prices and the total Bid Price submitted by the Bidder.
15. Currencies of Bid and Payment	15.1 The currency (ies) of the Bid and the currency (ies) of payments shall be the same and shall be as specified **in the BDS**. 15.2 Bidders 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 Bid are reasonable, in which case a detailed breakdown of the foreign currency requirements shall be provided by Bidders.
16. Documents Comprising the Technical Proposal	16.1 The Bidder shall furnish a technical proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in Section IV, Bidding Forms, in sufficient detail to demonstrate the adequacy of the Bidder's proposal to meet the work's requirements and the completion time.
17. Documents Establishing the Eligibility and Qualifications of the Bidder	17.1 To establish Bidder's eligibility in accordance with ITB 4, Bidders shall complete the Letter of Bid, included in Section IV, Bidding Forms. 17.2 In accordance with Section III, Evaluation and Qualification Criteria, to establish its qualifications to perform the Contract the Bidder shall provide the information requested in the corresponding information sheets included in Section IV, Bidding Forms.
	17.3 If a margin of preference applies as specified in accordance with ITB 33.1, domestic Bidders, 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 ITB 33.1.
18. Period of Validity of Bids	18.1 Bids shall remain valid until the date specified **in the BDS** or any extended date if amended by the Employer in accordance with ITB 8. A Bid that is not valid until the date specified **in the BDS,** or any extended date if amended by the Employer in accordance with ITB 8, shall be rejected by the Employer as nonresponsive.
	18.2 In exceptional circumstances, prior to the date of expiration of the Bid validity, the Employer may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing. If a Bid Security is requested in accordance with ITB 19, it shall also be extended for twenty-eight

	(28) days beyond the extended date for bid validity. A Bidder may refuse the request without forfeiting its Bid security. A Bidder granting the request shall not be required or permitted to modify its Bid, except as provided in ITB 18.3.
	18.3 If the award is delayed by a period exceeding fifty-six (56) days beyond the date of expiry of the Bid validity specified in accordance with ITB 18.1, the Contract price shall be determined as follows: (a) in the case of **fixed price** contracts, the Contract price shall be the Bid price adjusted by the factor specified **in the BDS**; (b) in the case of **adjustable price** contracts, no adjustment shall be made; or (c) in any case, Bid evaluation shall be based on the Bid price without taking into consideration the applicable correction from those indicated above.
19. Bid Security	19.1 The Bidder shall furnish as part of its Bid, either a Bid-Securing Declaration or a Bid Security as specified **in the BDS**, in original form and, in the case of a Bid Security, in the amount and currency specified **in the BDS**.
	19.2 A Bid-Securing Declaration shall use the form included in Section IV, Bidding Forms.
	19.3 If a Bid Security is specified pursuant to ITB 19.1, the Bid Security shall be a demand guarantee in any of the following forms at the Bidder's option: (a) an unconditional guarantee issued by a bank or non-bank financial institution (such as an insurance, bonding or surety company); (b) an irrevocable letter of credit; (c) a cashier's or certified check; or (d) another security specified **in the BDS**, from a reputable source from an eligible country. If an unconditional guarantee is issued by a non-bank financial institution located outside the Employer's Country, the issuing non-bank financial institution shall have a correspondent financial institution located in the Employer's Country to make it enforceable unless the Employer has agreed in writing, prior to Bid submission, that a correspondent financial institution is not required. In the case of a bank guarantee, the Bid Security shall be submitted either using the Bid Security Form included in Section IV, Bidding Forms, or in another substantially similar format approved by the Employer prior to Bid submission. The Bid Security shall be valid for twenty-eight (28) days beyond the original date of expiry of the Bid validity, or beyond any extended date if requested under ITB 18.2.
	19.4 If a Bid Security or Bid-Securing Declaration is specified pursuant to ITB 19.1, any Bid not accompanied by a substantially responsive Bid Security or Bid-Securing Declaration shall be rejected by the Employer as non-responsive.

	19.5 If a Bid Security is specified pursuant to ITB 19.1, the Bid Security of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder's signing the Contract and furnishing the Performance Security and if required **in the BDS**, the Environmental and Social (E&S) Performance Security pursuant to ITB 48.
	19.6 The Bid Security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required Performance Security, and if required **in the BDS**, the Environmental and Social (E&S) Performance Security.
	19.7 The Bid Security may be forfeited: (a) if a Bidder withdraws its Bid prior to the expiry date of the Bid validity specified by the Bidder on the Letter of Bid, or any extended date provided by the Bidder; or (b) if the successful Bidder fails to: (i) sign the Contract in accordance with ITB 47; or (ii) furnish a Performance Security and if required **in the BDS**, the Environmental and Social (E&S) Performance Security in accordance with ITB 48.
	19.8 The Bid Security or the Bid-Securing Declaration of a JV shall be in the name of the JV that submits the Bid. If the JV has not been legally constituted into a legally enforceable JV at the time of Bidding, the Bid Security or the Bid-Securing Declaration shall be in the names of all future members as named in the letter of intent referred to in ITB 4.1 and ITB 11.2. 19.9 If a Bid Security is not required **in the BDS**, pursuant to ITB 19.1, and: (a) if a Bidder withdraws its Bid prior to the expiry date of the Bid validity specified by the Bidder on the Letter of Bid or any extended date provided by the Bidder; or (b) if the successful Bidder fails to: (i) sign the Contract in accordance with ITB 47; or (ii) furnish a Performance Security and, if required **in the BDS**, the Environmental and Social (E&S) Performance Security in accordance with ITB 48, the Borrower may, if provided for **in the BDS,** declare the Bidder ineligible to be awarded a contract by the Employer for a period of time stated **in the BDS**.
20. Format and Signing of Bid	20.1 The Bidder shall prepare one original of the documents comprising the Bid as described in ITB 11 and clearly mark it "ORIGINAL." Alternative Bids, if permitted in accordance with ITB 13, shall be clearly marked "ALTERNATIVE." In addition, the Bidder shall submit copies of the Bid, in the number specified **in the BDS**

	and clearly mark them "COPY." In the event of any discrepancy between the original and the copies, the original shall prevail.
	20.2 Bidders shall mark as "CONFIDENTIAL" all information in their Bids 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 Bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified **in the BDS** and shall be attached to the Bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Bid where entries or amendments have been made shall be signed or initialed by the person signing the Bid.
	20.4 In case the Bidder is a JV, the Bid 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 inter-lineation, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Bid.
	D. Submission and Opening of Bids
21. Sealing and Marking of Bids	21.1 The Bidder shall deliver the Bid in a single, sealed envelope (one-envelope Bidding process). Within the single envelope the Bidder shall place the following separate, sealed envelopes: (a) in an envelope marked "ORIGINAL", all documents comprising the Bid, as described in ITB 11; and (b) in an envelope marked "COPIES", all required copies of the Bid; and (c) if alternative Bids are permitted in accordance with ITB 13, and if relevant: (i) in an envelope marked "ORIGINAL –ALTERNATIVE BID", the alternative Bid; and (ii) in the envelope marked "COPIES- ALTERNATIVE BID", all required copies of the alternative Bid.
	21.2 The inner and outer envelopes shall: (a) bear the name and address of the Bidder; (b) be addressed to the Employer in accordance with ITB 22.1; (c) bear the specific identification of this Bidding process specified in accordance with BDS 1.1; and (d) bear a warning not to open before the time and date for Bid opening.

	21.3 If all envelopes are not sealed and marked as required, the Employer will assume no responsibility for the misplacement or premature opening of the Bid.
22. Deadline for Submission of Bids	22.1 Bids must be received by the Employer at the address and no later than the date and time specified **in the BDS**. When so specified **in the BDS**, Bidders shall have the option of submitting their Bids electronically. Bidders submitting Bids electronically shall follow the electronic Bid submission procedures specified **in the BDS**.
	22.2 The Employer may, at its discretion, extend the deadline for the submission of Bids by amending the Bidding document in accordance with ITB 8, in which case all rights and obligations of the Employer and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.
23. Late Bids	23.1 The Employer shall not consider any Bid that arrives after the deadline for submission of Bids, in accordance with ITB 22. Any Bid received by the Employer after the deadline for submission of Bids shall be declared late, rejected, and returned unopened to the Bidder.
24. Withdrawal, Substitution, and Modification of Bids	24.1 A Bidder may withdraw, substitute, or modify its Bid 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 ITB 20.3, (except that withdrawal notices do not require copies). The corresponding substitution or modification of the Bid must accompany the respective written notice. All notices must be: (a) prepared and submitted in accordance with ITB 20 and ITB 21 (except that withdrawals notices do not require copies), and in addition, the respective envelopes shall be clearly marked "WITHDRAWAL," "SUBSTITUTION," "MODIFICATION;" and (b) received by the Employer prior to the deadline prescribed for submission of Bids, in accordance with ITB 22.
	24.2 Bids requested to be withdrawn in accordance with ITB 24.1 shall be returned unopened to the Bidders.
	24.3 No Bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of Bids and the date of expiry of Bid validity specified by the Bidder on the Letter of Bid or any extended date thereof.
25. Bid Opening	25.1 Except in the cases specified in ITB 23 and ITB 24.2, the Employer shall publicly open and read out in accordance with this ITB all Bids received by the deadline, at the date, time and place specified **in the BDS**, in the presence of Bidders` designated representatives and anyone who chooses to attend. Any specific electronic Bid opening procedures required if electronic Bidding is permitted in accordance with ITB 22.1, shall be as specified **in the BDS**.

	25.2 First, envelopes marked "WITHDRAWAL" shall be opened and read out and the envelope with the corresponding Bid shall not be opened but returned to the Bidder. No Bid withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at Bid opening. 25.3 Next, envelopes marked "SUBSTITUTION" shall be opened and read out and exchanged with the corresponding Bid being substituted, and the substituted Bid shall not be opened, but returned to the Bidder. No Bid substitution shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out at Bid opening. 25.4 Next, envelopes marked "MODIFICATION" shall be opened and read out with the corresponding Bid. No Bid modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at Bid opening.
	25.5 Next, all remaining envelopes shall be opened one at a time, reading out: the name of the Bidder and whether there is a modification; the total Bid Price, per lot (contract) if applicable, including any discounts and alternative Bids; the presence or absence of a Bid Security or Bid-Securing Declaration, if required; and any other details as the Employer may consider appropriate. 25.6 Only Bids, alternative Bids and discounts that are opened and read out at Bid opening shall be considered further for evaluation. The Letter of Bid and the Bill of Quantities are to be initialed by representatives of the Employer attending Bid opening in the manner specified **in the BDS**.
	25.7 The Employer shall neither discuss the merits of any Bid nor reject any Bid (except for late Bids, in accordance with ITB 23.1). 25.8 The Employer shall prepare a record of the Bid opening that shall include, as a minimum: (a) the name of the Bidder and whether there is a withdrawal, substitution, or modification; (b) the Bid Price, per lot (contract) if applicable, including any discounts; (c) any alternative Bids; (d) the presence or absence of a Bid Security, if one was required. 25.9 The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders.
	E. Evaluation and Comparison of Bids
26. Confidentiality	26.1 Information relating to the evaluation of Bids and recommendation of contract award shall not be disclosed to Bidders or any other persons not officially

	concerned with the Bidding process until information on Intention to Award the Contract is transmitted to all Bidders in accordance with ITB 43.
	26.2 Any effort by a Bidder to influence the Employer in the evaluation of the Bids or Contract award decisions may result in the rejection of its Bid.
	26.3 Notwithstanding ITB 26.2, from the time of Bid opening to the time of Contract award, if a Bidder wishes to contact the Employer on any matter related to the Bidding process, it shall do so in writing.
27. Clarification of Bids	27.1 To assist in the examination, evaluation, and comparison of the Bids, and qualification of the Bidders, the Employer may, at its discretion, ask any Bidder for a clarification of its Bid, given a reasonable time for a response. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The Employer's request for clarification and the response shall be in writing. No change, including any voluntary increase or decrease, in the prices or substance of the Bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Bids, in accordance with ITB 31.
	27.2 If a Bidder does not provide clarifications of its Bid by the date and time set in the Employer's request for clarification, its Bid may be rejected.
28. Deviations, Reservations, and Omissions	28.1 During the evaluation of Bids, the following definitions apply: (a) "Deviation" is a departure from the requirements specified in the Bidding document; (b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding document; and (c) "Omission" is the failure to submit part or all of the information or documentation required in the Bidding document.
29. Determination of Responsiveness	29.1 The Employer's determination of a Bid's responsiveness is to be based on the contents of the Bid itself, as defined in ITB 11.
	29.2 A substantially responsive Bid is one that meets the requirements of the Bidding 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 Bidding document, the Employer's rights or the Bidder's obligations under the proposed Contract; or

	(b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive Bids.
	29.3 The Employer shall examine the technical aspects of the Bid submitted in accordance with ITB 16, in particular, to confirm that all requirements of Section VII, Works' Requirements have been met without any material deviation, reservation or omission.
	29.4 If a Bid is not substantially responsive to the requirements of the Bidding document, it shall be rejected by the Employer and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.
30. Nonmaterial Nonconformities	30.1 Provided that a Bid is substantially responsive, the Employer may waive any nonconformities in the Bid.
	30.2 Provided that a Bid is substantially responsive, the Employer may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities in the Bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any aspect of the price of the Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.
	30.3 Provided that a Bid is substantially responsive, the Employer shall rectify quantifiable nonmaterial nonconformities related to the Bid Price. To this effect, the Bid Price shall be adjusted, for comparison purposes only to reflect the price of a missing or non-conforming item or component, by adding the average price of the item or component quoted by substantially responsive Bidders. If the price of the item or component cannot be derived from the price of other substantially responsive Bids, the Employer shall use its best estimate.
31. Correction of Arithmetical Errors	31.1 Provided that the Bid is substantially responsive, 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.
	31.2 Bidders shall be requested to accept correction of arithmetical errors. Failure to accept the correction in accordance with ITB 31.1, shall result in the rejection of the Bid.
32. Conversion to Single Currency	32.1 For evaluation and comparison purposes, the currency(ies) of the Bid shall be converted into a single currency as specified **in the BDS**.
33. Margin of Preference	33.1 Unless otherwise specified **in the BDS,** a margin of preference for domestic Bidders[1] shall not apply.
34. Subcontractors	34.1 Unless otherwise stated **in the BDS,** the Employer does not intend to execute any specific elements of the Works by subcontractors selected in advance by the Employer.
	34.2 Bidders may propose subcontracting up to the percentage of total value of contracts or the volume of works as specified **in the BDS**. Subcontractors proposed by the Bidder shall be fully qualified for their parts of the Works.
	34.3 The subcontractor's qualifications shall not be used by the Bidder to qualify for the Works unless their specialized parts of the Works were previously designated by the Employer **in the BDS** as can be met by subcontractors referred to hereafter as 'Specialized Subcontractors', in which case, the qualifications of the Specialized Subcontractors proposed by the Bidder may be added to the qualifications of the Bidder.
35. Evaluation of Bids	**Technical Evaluation** 35.1 The Employer shall evaluate the Bids using the criteria and methodologies listed in Section III, Evaluation and Qualification Criteria. 35.2 If specified **in the BDS**, 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 Bid Score will be calculated for each responsive Bid 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 BDS**. The weight to be assigned for the Technical factors and cost is specified **in the BDS**.

[1] An individual firm is considered a domestic Bidder for purposes of the margin of preference if it is registered in the country of the Employer, has more than 50 percent ownership by nationals of the country of the Employer, and if it does not subcontract more than 10 percent of the contract price, excluding provisional sums, to foreign contractors. JVs are considered as domestic Bidders and eligible for domestic preference only if the individual member firms are registered in the country of the Employer or have more than 50 percent ownership by nationals of the country of the Employer, and the JV shall be registered in the country of the Borrower. The JV shall not subcontract more than 10 percent of the contract price, excluding provisional sums, to foreign firms. JVs between foreign and national firms will not be eligible for domestic preference.

	Financial Evaluation 35.3 To evaluate a Bid, the Employer shall consider the following:
	(a) the Bid price, excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill of Quantities, but including Day work items, where priced competitively; (b) price adjustment for correction of arithmetic errors in accordance with ITB 31.1; (c) price adjustment due to discounts offered in accordance with ITB 14.4; (d) converting the amount resulting from applying (a) to (c) above, if relevant, to a single currency in accordance with ITB 32; (e) price adjustment due to quantifiable nonmaterial nonconformities in accordance with ITB 30.3; and (f) the additional evaluation factors specified **in the BDS** and Section III, Evaluation and Qualification Criteria.
	35.4 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in Bid evaluation.
	35.5 If this Bidding document allows Bidders to quote separate prices for different lots (contracts), the methodology to determine the lowest evaluated cost of the lot (contract) combinations, including any discounts offered in the Letter of Bid, is specified in Section III, Evaluation and Qualification Criteria. If, however, rated criteria is used in accordance with ITB 35.2, discounts on condition of award of more than one contract will not be used for Bid evaluation purpose.
36. Comparison of Bids	36.1 The Employer shall compare the evaluated costs of all substantially responsive Bids established in accordance with ITB 35.1 to determine the Bid that has the lowest evaluated cost. 36.2 If ITB 35.2 is applicable, the Employer will determine the Bid with the highest combined technical and financial score in accordance with BDS 35.2.
37. Abnormally Low Bids	37.1 An Abnormally Low Bid is one where the Bid price, in combination with other elements of the Bid, appears so low that it raises material concerns as to the capability of the Bidder in regard to the Bidder's ability to perform the Contract for the offered Bid Price. 37.2 In the event of identification of a potentially Abnormally Low Bid, the Employer shall seek written clarifications from the Bidder, including detailed price analyses of its Bid price in relation to the subject matter of the contract, scope, proposed methodology, schedule, allocation of risks and responsibilities and any other requirements of the Bidding document.

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Project Director

	37.3 After evaluation of the price analyses, in the event that the Employer determines that the Bidder has failed to demonstrate its capability to perform the Contract for the offered Bid Price, the Employer shall reject the Bid.
38. Unbalanced or Front Loaded Bids	38.1 If the Bid that is evaluated as the lowest evaluated cost is, in the Employer's opinion, seriously unbalanced or front loaded, the Employer may require the Bidder to provide written clarifications. Clarifications may include detailed price analyses to demonstrate the consistency of the Bid prices with the scope of works, proposed methodology, schedule and any other requirements of the Bidding document. 38.2 After the evaluation of the information and detailed price analyses presented by the Bidder, the Employer may as appropriate: (a) accept the Bid; or (b) require that the total amount of the Performance Security be increased at the expense of the Bidder to a level not exceeding 20% of the Contract Price; or (c) reject the Bid.
39. Qualifications of the Bidder	39.1 The Employer shall determine to its satisfaction whether the eligible Bidder that is selected as having submitted the lowest evaluated cost and substantially responsive Bid, meets the qualifying criteria specified in Section III, Evaluation and Qualification Criteria.
	39.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB 17. The determination shall not take into consideration the qualifications of other firms such as the Bidder's subsidiaries, parent entities, affiliates, subcontractors (other than Specialized Subcontractors if permitted in the Bidding document), or any other firm(s) different from the Bidder.
	39.3 Prior to Contract award, the Employer will verify that the successful Bidder (including each member of a JV) is not disqualified by the Bank due to noncompliance with contractual SEA/SH prevention and response obligations. The Employer will conduct the same verification for each subcontractor proposed by the successful Bidder. If any proposed subcontractor does not meet the requirement, the Employer will require the Bidder to propose a replacement subcontractor..
	39.4 An affirmative determination shall be a prerequisite for award of the Contract to the Bidder. A negative determination shall result in disqualification of the Bid, in which event the Employer shall proceed to the Bidder who offers a substantially responsive Bid with the next lowest evaluated cost to make a similar determination of that Bidder's qualifications to perform satisfactorily.

40. Most Advantageous Bid	40.1 The Employer shall determine the Most Advantageous Bid. The Most Advantageous Bid is the Bid of the Bidder that meets the Qualification Criteria and whose Bid has been determined to be substantially responsive to the Bidding document and: (a) when **rated criteria are used** is the Bid with the highest combined technical and financial score**;** or (b) when **rated criteria are not used**, is the Bid with the lowest evaluated cost.
41. Employer's Right to Accept Any Bid, and to Reject Any or All Bids	41.1 The Employer reserves the right to accept or reject any Bid and to annul the Bidding process and reject all Bids at any time prior to Contract Award, without thereby incurring any liability to Bidders. In case of annulment, all Bids submitted and specifically, Bid securities, shall be promptly returned to the Bidders.
42. Standstill Period	42.1 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 ITB 46. The Standstill Period commences the day after the date the Employer has transmitted to each Bidder the Notification of Intention to Award the Contract. Where only one Bid is submitted, or if this contract is in response to an emergency situation recognized by the Bank, the Standstill Period shall not apply.
43. Notification of Intention to Award	43.1 The Employer shall send to each Bidder the Notification of Intention to Award the Contract to the successful Bidder. The Notification of Intention to Award shall contain, at a minimum, the following information: (a) the name and address of the Bidder submitting the successful Bid; (b) the Contract price of the successful Bid; (c) the names of all Bidders who submitted Bids, and their Bid prices as readout, and as evaluated; (d) a statement of the reason(s) the Bid (of the unsuccessful Bidder to whom the notification is addressed) was unsuccessful, unless the price 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;
F. Award of Contract	
44. Award Criteria	44.1 Subject to ITB 41, the Employer shall award the Contract to the successful Bidder. This is the Bidder whose Bid has been determined to be the Most Advantageous Bid.

45. Notification of Award	45.1 Prior to the date of expiry of the bid validity, and upon expiry of the Standstill Period specified in ITB 42.1 or any extension thereof, and, upon satisfactorily addressing any complaint that has been filed within the Standstill Period, the Employer shall notify the successful Bidder, in writing, that its Bid 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"). 45.2 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 selection method used; (c) names of all Bidders that submitted Bids, and their Bid prices as read out at Bid opening, and as evaluated; (d) names of all Bidders whose Bids 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 Bidder, the final total contract price, the contract duration and a summary of its scope; and (f) successful Bidder's Beneficial Ownership Disclosure Form, if specified in BDS ITB 47.1 45.3 The Contract Award Notice shall be published on the Employer's website 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 UNDB online. 45.4 Until a formal Contract is prepared and executed, the Letter of Acceptance shall constitute a binding Contract.
46. Debriefing by the Employer	46.1 On receipt of the Employer's Notification of Intention to Award referred to in ITB 43.1, an unsuccessful Bidder 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 Bidders whose request is received within this deadline. 46.2 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 Bidders of the extended standstill period. 46.3 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 Public Notice of Award of contract. Requests for debriefing received outside the three (3)-day deadline shall not lead to extension of the standstill period. 46.4 Debriefings of unsuccessful Bidders may be done in writing or verbally. The Bidder shall bear its own costs of attending such a debriefing meeting.
47. Signing of Contract	47.1 The Employer shall send to the successful Bidder the Letter of Acceptance including the Contract Agreement, and, if specified **in the BDS**, 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.
	47.2 The successful Bidder shall sign, date and return to the Employer, the Contract Agreement within twenty-eight (28) days of its receipt.
48. Performance Security	48.1 Within twenty-eight (28) days of the receipt of the Letter of Acceptance from the Employer, the successful Bidder shall furnish the Performance Security and, if required **in the BDS**, the Environmental and Social (E&S) Performance Security in accordance with the Conditions of Contract, subject to ITB 38.2 (b), using for that purpose the Performance Security and E&S Performance Security Forms included in Section X, Contract Forms, or another form acceptable to the Employer. If the Performance Security furnished by the successful Bidder is in the form of a bond, it shall be issued by a bonding or insurance company that has been determined by the successful Bidder to be acceptable to the Employer. A foreign institution providing a bond shall have a correspondent financial institution located in the Employer's Country, unless the Employer has agreed in writing that a correspondent financial institution is not required.
	48.2 Failure of the successful Bidder to submit the above-mentioned Performance Security and, if required **in the BDS**, the Environmental and Social (E&S) Performance Security, or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security. In that event the Employer may award the Contract to the Bidder offering the next Most Advantageous Bid.
49. Procurement Related Complaint	49.1 The procedures for making a Procurement-related Complaint are as specified **in the BDS**.

Section II - Bid Data Sheet (BDS)

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

A. General	
ITB 1.1	The reference number of the Request for Bids (RFB)is: SRCTIP-DOR-W-KDP-ICB-4 (Lot 1, 2and 3) The Employer is*:* Department of Roads, Development Cooperation Implementation Division, **Strategic Road Connectivity & Trade Improvement Project** The name of the RFB is: **Upgrading of of Mahendra Highway Kamala-Dhalkebar- Bagmati Road Section and bridges (Km 238+030to km 312+785)** Contract Identification No.**:** SRCTIP-DOR-W-KDP-ICB-4 (Lot 1, 2 and 3) The number and identification of lots (contracts) comprising this RFB is: **i.** SRCTIP-DOR-W-KDP-ICB-4 (Lot 1) ii. SRCTIP-DOR-W-KDP-ICB-4 (Lot 2) iii SRCTIP-DOR-W-KDP-ICB-4 (Lot 3)
ITB 1.2	**Electronic – Procurement System** The Employer shall use the following electronic-procurement system to manage this Bidding process: **www.bolpatra.gov.np** The electronic-procurement system shall be used to manage the following aspects of the Bidding process: **Issuing Bidding Document, submission of Bids, opening of Bids**.
ITB 2.1	The Borrower is: Government of Nepal Loan or Financing Agreement amount: 450 Million USD The name of the Project is: **Strategic Road Connectivity & Trade Improvement Project**
ITB 4.1	Maximum number of members in the JV shall be: **Three (3).**
ITB 4.5	A list of debarred firms and individuals is available on the Bank's external website: *http://www.worldbank.org/debarr.*

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B. Contents of Bidding Document	
ITB 7.1	For **Clarification of Bid purposes** only, the Employer's address is: Attention: Project Director Address: Development Cooperation Implementation Division (DCID), Babarmahal, Kathmandu City: Kathmandu ZIP Code: 44600 Country: Nepal Telephone: +**977-1-5903753** Electronic mail address: ***dorfcb@dor.gov.np***
ITB 7.4	A Pre-Bid meeting **shall** take place at the following date, time and place: Date: **15th April 2024**. Time: **14:00 hours (Nepal Standard Time)** Place: **Department of Roads, Chakupat, Kathmandu** A site visit conducted by the Employer **shall not be** organized.
ITB 7.6	Web page: *www.dor.gov.np/home/notices*
C. Preparation of Bids	
ITB 10.1	The language of the Bid is: **English**. All correspondence exchange shall be in **English** language. Language for translation of supporting documents and printed literature is **English.**

ITB11.1 (h)	The Bidder shall submit the following additional documents in its Bid: • Bank Voucher for cost of bid document • Joint venture agreement under an existing agreement or with the intent to enter into such an agreement supported by a letter of intent **Code of Conduct for Contractor's Personnel (E&S)** The Bidder shall submit its Code of Conduct that will apply to Contractor's Personnel including subcontractor's (as defined in Sub-Clause 1.1.17 of the General Conditions of Contract), to ensure compliance with the Contractor's Environmental and Social (E&S) obligations under the Contract. The Bidder 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 Bidder may introduce additional requirements, including as necessary to take into account specific Contract issues/risks. **Management Strategies and Implementation Plans (MSIP) to manage the (E&S) risks** The Bidder shall submit Management Strategies and Implementation Plans (MSIPs) to manage the following key Environmental and Social (E&S) risks: • Compensatory Tree Plantation Method • Contractor's Environmental and Social Management Plan (C-ESMP); • Traffic Management Plan to ensure safety of local communities from construction traffic and also allowing smooth vehicular movement without any interruption during active construction period; • Sexual Exploitation and Abuse (SEA) prevention and response action plan with dedicated mechanism to redress SEA/SH related grievances and concerns ; • Spoil disposal management plan and stockpiling plan to minimize the impact during construction and rehabilitate landscape after construction; • Air and Noise Quality Management Plan to minimize vehicle emissions, manage fugitive dust, noise and vibration during construction; • Solid Waste Management Plan to manage solid wastes (including hazardous wastes) during road construction and operations; • Effluent Management and Discharge Management Plant especially from Batching Plant, Labour Camp and Kitchen, Warehouse/Workshops and Garage etc. meeting the National Effluent Discharge Standard and Good International Industry

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	Practice (GIIP) such as World Bank Group's Environmental Health and Safety Guidelines; • Plan for Quarrying of materials & their operation, restoration • Burrow pit operation and management plan; • Occupational Health and Safety Plan; • Labor Management Plan (including GRM for workers) • Workers Camp Facilities and Camp Management Plan; • Community Health and Safety Management Plan; • Emergency preparedness plan including accident and incident reporting and management plan • Chance Finds Procedure (as per Sub-Clause 4.23) • Biodiversity Protection/ Management Plan
ITB 11.2	**The following text is added at the end of ITB 11.2** **Joint Venture Arrangements shall have the following provisions:** i**)** Joint Venture Agreement shall nominate a lead member who will lead and bind the joint venture and will have the authority to conduct all business for and on behalf of any and all members of the JV during the bidding process and, in the event the JV is awarded the Contract, during contract execution, ii) Lead member shall have lead/principal share in the joint venture, iii) The Joint Venture Agreement should specify the scope and part of the contract to be carried out by each Joint Venture member. The assigned scope and parts of contract should correspond the members' respective experience and capacity to implement them; and iv) The Joint Venture agreement includes the clause: "Joint and Several Liability: All members of the joint venture (JV) shall be jointly and severally liable to the Employer for the execution of the entire Contract. The JV leader shall have the authority to bind the JV. Neither the composition, the constitution, and the legal status nor the scope and parts of the Contract to be carried out by each member, as specified in the Joint Venture Agreement, shall be altered without the prior consent of the Employer**.** Such consent shall not relieve any altered JV from the joint and several liability to the Employer for the execution of the entire Contract."
ITB 13.1	ITB 13 is not applicable. Alternative Bids shall **not** be permitted.
ITB 13.2	Alternative times for completion **shall not be** permitted.
ITB 13.4	Alternative technical solutions shall be permitted for the following parts of the Works: **Not applicable**

ITB 14.5	The prices quoted by the Bidder shall be **subject to adjustment**
ITB 15.1	The currency(ies) of the Bid and the payment currency(ies) shall be in accordance with **Alternative A** as described below: **Alternative A (Bidders to quote entirely in local currency):** (a) The unit rates and the prices shall be quoted by the Bidder in the Bill of Quantities, entirely in **Nepalese Rupees** and further referred to as "the local currency". A Bidder expecting to incur expenditures in other currencies for inputs to the Works supplied from outside the Employer's country (referred to as "the foreign currency requirements") shall indicate in the Appendix to Bid - Table C, the percentage(s) of the Bid Price (excluding Provisional Sums), needed by the Bidder for the payment of such foreign currency requirements, limited to no more than three foreign currencies. (b) The rates of exchange to be used by the Bidder in arriving at the local currency equivalent and the percentage(s) mentioned in (a) above shall be specified by the Bidder in the Appendix to Bid - Table C, and shall apply for all payments under the Contract so that no exchange risk will be borne by the successful Bidder.
ITB 18.1	**The Bid shall be valid until: 6th October 2024**
ITB18.3 (a)	The Bid price shall be adjusted by the following factor(s): **Not Applicable**
ITB 19.1	A bid security shall be required as follows: a. Lot 1: 1.4 million USD; b. Lot 2: 1.6 million USD; c. Lot 3: 1.6 million USD; or equivalent to NPR, or any other convertible currency calculated on the basis of selling exchange rate of the Nepal Rastra Bank on the date of 28 days before the initial/original date of bids opening.
ITB 19.3 (a)	Bid security shall be in the form of an **unconditional and irrevocable guarantee** issued by a bank as per the form provided in section IV Bidding Forms, Form of Bid Security – Demand Guarantee.
ITB 19.3 (b)	**Not Applicable**
ITB 19.3 (c)	**Not Applicable**
ITB 19.3 (d)	Other types of acceptable securities: **None**
ITB 20.1	In addition to the original of the Bid, the number of copies is: **One (1)** In case of e-submission of bid:

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	The Bidder shall submit the bid electronically in PDF files in the manner as specified in ITB Clause 22.1, and submission of hard copy of "original bid plus one copy of bid" (as stated above) is not required.
ITB 20.3	The written confirmation of authorization to sign on behalf of the Bidder shall consist of: a. The name and description of the documentation required to demonstrate the authority of the signatory to sign the Bid such as a Power of Attorney; and b. In the case of Bids submitted by an existing or intended JV an undertaking signed by all parties (i) stating that all parties shall be jointly and severally liable, if so required in accordance with ITB 4.1, and (ii) nominating a Representative who shall have the authority to conduct all business for and on behalf of any and all the parties of the JV during the bidding process and, during contract execution in the event the JV is awarded the Contract.
D. Submission and Opening of Bids	
ITB 22.1	For **Bid submission purposes** only, the Employer's address is: Attention: Project Director Address: Development Cooperation Implementation Division City: Kathmandu ZIP Code: Country: Nepal Telephone: **+977-1-5903753** The deadline for Bid submission is: Date: 10th May **2024** Time: **12:00 hours (Nepal Standard Time)** **Bidders shall have the option of submitting their Bids electronically through e-GP.** **The electronic bid (through e-GP) submission procedures shall be as follows:** i. For e-submission, the bidder is required to register in the e-GP portal *https://www.bolpatra.gov.np* for downloading and submitting the bid electronically. ii. Interested bidder may either purchase the bidding documents from the Employer's office as specified in the Request for Bids (RFB) or bidders registered in the e-GP portal of Public Procurement Monitoring Office (PPMO) may download the bidding document from *http://www.bolpatra.gov.np* after login. If bidders choose to download the bidding document and submit the bidding documents electronically, then the cost of the bidding document shall be deposited as specified in RFB. In addition, electronic scanned copy (.pdf format) of the bank deposit voucher/cash receipt should also be submitted along with the electronic bid submission files. iii. The bidder shall then prepare/fill the documents and forms included in the issued bidding documents or the downloaded bidding documents from the e-GP portal of PPMO *http://www.bolpatra.gov.np* as

	applicable. The required documents and forms shall be prepared in PDF form and uploaded in the e-GP system. **Note:** (a) Bidders (all partners in case of JV) should verify/update their profile documents as appropriate for the specific bid before submitting their bid electronically. (b) The Bidder shall then upload the PDF bid files and submit the complete bid document through e-GP portal of PPMO- *http://www.bolpatra.gov.np* within the specified date and time as mentioned in the PPMO website. (c) Biders are advised to download the bid submission report to ensure that all the documents/ files are up to date and complete. (d) The Bidders shall meet the following requirements and conditions for e-submission of bids; aa) The facility for submission of bids electronically through e-submission is to promote transparency, non-discrimination, equality of access, and open competition in the application process. The Bidders are fully responsible to use the e- submission facility properly in e-GP portal of PPMO- *http://www.bolpatra.gov.np* as per specified procedures and in no case the Employer shall be held liable for Bidder's inability to use this facility. When a Bidder submits electronic application through the PPMO e-GP portal, it is assumed that the bidder has prepared the bid by studying and examining the complete set of the bidding documents. Bidders who submit electronic bid should deposit the bidding document fee as specified in RFB and upload the scan copy (in pdf format) of the deposit voucher at the time of bid submission. The deposited amount shall be verified by the Employer during the evaluation process. Bidders are cautioned to ensure that they provide evidence of payment for the cost of the Bidding Document along with their bid. In case of e-submission, discount offered in scan copy of Letter of Bid and e-GP system, the discount mentioned in Letter of Bid shall prevail, if any.
ITB 25.1	The Bid opening shall take place at: Address: Department of Roads, Development Cooperation Implementation Division (DCID), Babarmahal City: Kathmandu. Country: Nepal Telephone: +**977-1-5903753** Electronic mail address: ***dorfcb@dor.gov.np*** Date: 10th May .2024 Time: **13:00 hours (Nepal Standard Time)**

ITB 25.1	The electronic Bid opening procedures shall be: E-submitted bids will be downloaded from PPMO's e-GP portal and minute of Bid opening will be prepared/generated.
ITB 25.6	The Letter of Bid and priced Bill of Quantities shall be initialed by representatives of the Employer and the Bidder conducting Bid opening. Any modification to the unit or total price shall be initialed by the Representatives who choose to attend the Bid opening.
E. Evaluation, and Comparison of Bids	
ITB 32.1	The currency that shall be used for Bid evaluation and comparison purposes to convert at the selling exchange rate all Bid prices expressed in various currencies into a single currency is: **Nepalese Rupees.** The source of exchange rate shall be: **Nepal Rastra Bank – Selling Rate.** The date for the exchange rate shall be*: **28 days prior to deadline of submission of bid.*** The currency(ies) of the Bid shall be converted into a single currency in accordance with the procedure under **Alternative A** that follows: ***Alternative A: Bidders quote entirely in local currency*** For comparison of Bids, the Bid Price, corrected pursuant to ITB 31, shall first be broken down into the respective amounts payable in various currencies by using the selling exchange rates specified by the Bidder in accordance with ITB 15.1. In the second step, the Employer will convert the amounts in various currencies in which the Bid Price is payable (excluding Provisional Sums but including Daywork where priced competitively) to the single currency identified above at the selling rates established for similar transactions by the authority specified and on the date stipulated above.
ITB 33.1	A margin of domestic preference **shall not** apply. **The application methodology will be as per Section III, Evaluation and Qualification Criteria.**
ITB 34.1	At this time the Employer **does not intend** to execute certain specific parts of the Works by subcontractors selected in advance.
ITB 34.2	Contractor's proposed subcontracting: Maximum percentage of subcontracting permitted is: **25% of the total contract amount.** Bidders planning to subcontract more than 10% of total volume of work shall specify, in the Letter of Bid, the activity (ies) or parts of the Works to be subcontracted along with complete details of the Subcontractors and their qualification and experience.
ITB 34.3	**Not Applicable**
ITB 35.2	**Does not apply**

ITB 37.1	**Add the following at the end of ITB 37.1:** For such bids, the Employer shall check if the lowest priced and qualified bid is potentially Abnormally Low Bid (ALB). A potential ALB is identified where the evaluated bid price is more than one standard deviation below the average of the evaluated bid prices of substantially responsive evaluated bids.
ITB 37.3	**Modify ITB 37.3 as under:** After evaluation of the price analyses including inputs and costs of labor, materials, equipment and sundries, and clarifications, and verification thereof (if required), in the event the Employer determines that the Bidder has failed to demonstrate its capability to perform the Contract for the offered Bid Price, the Employer shall reject the Bid
F. Award of Contract	
ITB 47.1	The successful Bidder **shall** submit the Beneficial Ownership Disclosure Form.
ITB 48.1 & 48.2	The successful Bidder **shall** submit an Environmental and Social (E&S) Performance Security.
ITB 49.1	The procedures for making a Procurement-related Complaint are detailed in the "**Procurement Regulations for IPF Borrowers** (Annex III)." If a Bidder wishes to make a Procurement-related Complaint, the Bidder shall submit its complaint following these procedures, In Writing (by the quickest means available, such as by email or fax), to: For the attention: **Dr. Bijaya Jaishi** Title/position: **Project Director** Employer: **Department of Roads, Development Cooperation Implementation Division, Strategic Road Connectivity & Trade Improvement Project** Email address: ***dorfcb@dor.gov.np*** In summary, a Procurement-related Complaint may challenge any of the following: **1.** the terms of the Bidding Documents; and **2.** the Employer's decision to award the contract.

Section III - Evaluation and Qualification Criteria

This section contains all the criteria that the Employer shall use to evaluate Bids and qualify Bidders. No other factors, methods or criteria shall be used other than specified in this Bidding document. The Bidder shall provide all the information requested in the forms included in Section IV, Bidding Forms.

Wherever a Bidder is required to state a monetary amount, Bidders 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 is 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 ITB 32.1. Any error in determining the exchange rates in the Bid may be corrected by the Employer.

A. Technical and Financial Evaluation

1. Evaluation of Technical Proposal

In addition to the criteria listed in ITB 35.3 (a) – (e) the following criteria shall apply

Assessment of adequacy of Technical Proposal with Requirements in accordance with **ITB 35.1.**

1. Techinical Proposal Scoring Methology**: *Not Applicable***
2. Sustainable Procurement**: *Not Applicable***
3. Alternative Technical Solutions for specified parts of the Works: ***Not Applicable.***

2. Financial Evaluation

2.1 Margin of Preference – Not Applicable

2.2 Criteria for Financial Evaluation

In addition to the criteria listed in ITB 35.3 (a) – (e) the following criteria shall apply:

(i) Time Schedule

Time for completion of the Works from the Commencment Date shall be as specified in the Particular Conditions Part A-Contract Data Sub-clause 1.1.84. No credit will be given for earlier completion.

(i) Life Cycle Costs

Life cycle costing shall not apply.

3. Combined Evaluation: Not Applicable

B. Multiple Contracts

If permitted under ITB 35.5, will be evaluated as follows:

(i) Award Criteria for Multiple Contracts [ITB 35.5]:

(a) When rated criteria is not applied

Lots:

Contract No. SRCTIP-DOR-W-KDP-ICB-04 (Lot 1), SRCTIP-DOR-W-KDP-ICB-05 (Lot 2) and Contract No. SRCTIP-DOR-W-KDP-ICB-06 (Lot 3) will be evaluated in multiple contracts basis. Bidders have the option to Bid for any one or more lots. Bids will be evaluated lot-wise, taking into account discounts offered, if any, after considering all possible combination of lots. The contract(s) will be awarded to the Bidder or Bidders offering the lowest evaluated cost to the Employer for combined packages, subject to the selected Bidder(s) meeting the required qualification criteria for lot or combination of lots as the case may be.

For the award of multiple contracts (ICB-04, ICB-05 & ICB-06) within the lots, the bidder's capacity to meet the aggregated requirements as per this bidding document shall be assessed.

(b) When rated criteria is applied: Not Applicable

C. Specialized Subcontractors

Only the Specialized Subcontractors as approved by the Employer will be considered. The Specialized Subcontractor proposed by the Bidder shall be fully qualified for their parts of the Works. The general experience and financial resources of the Specialized Subcontractors shall not be added to those of the Bidder for purposes of qualification of the Bidder.

A. **Qualification**

(i) Eligibility and qualification Criteria

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	**Subject**	**Requirement**	**Single Entity**	**Joint Venture (existing or intended)**			**Submission Requirements**
				All Members Combined	**Each Member**	**Lead Member**	
1. Eligibility							
1.1	**Nationality**	Nationality in accordance with ITB 4.4	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Forms ELI – 1.1 and 1.2, with attachments
1.2	**Conflict of Interest**	No conflicts of interest in accordance with ITB 4.2	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Letter of Bid
1.3	**Bank Eligibility**	Not having been declared ineligible by the Bank, as described in ITB 4.5.	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Letter of Bid
1.4	**State- owned Enterprise or Institution of the Borrower country**	Meets conditions of ITB 4.6	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Forms ELI – 1.1 and 1.2, with attachments
1.5	**United Nations resolution or Borrower's country law**	Not having been excluded as a result of prohibition in the Borrower's country laws or official regulations against commercial relations with the Bidder's country, or by an act of compliance with UN Security Council resolution, both in accordance with ITB 4.8 and Section V.	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**	**Lead Member**	
2. Historical Contract Non-Performance							
2.1	**History of Non-Performing 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 requirements	Must meet requirement[2]	N/A	Form CON-2
2.2	**Suspension Based on Execution of Bid/Proposal Securing Declaration by the Employer**	Not under suspension based on-execution of a Bid/Proposal Securing Declaration pursuant to ITB 4.7 and ITB 19.9	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Letter of Bid
2.3	**Pending Litigation**	Bidder's financial position and prospective long-term profitability still sound according to criteria established in 3.1 below and assuming that all pending litigation will be resolved against the Bidder	Must meet requirement	N/A	Must meet requirement	N/A	Form CON – 2
2.4	**Litigation History**	No consistent history of court/arbitral award	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Form CON – 2

[1] Nonperformance, as decided by the Employer, shall include all contracts where (a) nonperformance 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. Nonperformance shall not include contracts where Employers decision was overruled by the dispute resolution mechanism. Nonperformance 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 Bidder have been exhausted.

[2] This requirement also applies to contracts executed by the Bidder as JV member.

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	**Subject**	**Requirement**	**Single Entity**	**Joint Venture (existing or intended)**			**Submission Requirements**
				All Members Combined	**Each Member**	**Lead Member**	
		decisions against the Bidder[3] since **1st January *2018***					
2.5	**Declaration: Environmental and Social (E&S) past performance**	Declare any civil work contracts that have been suspended or terminated and/or performance security called by an employer for reasons of breach of environmental, or social (including Sexual Exploitation, and Abuse) contractual obligations since 01 January 2018.[4]	Must make the declaration. Where there are Specialized Subcontractor/s, the Specialized Subcontractor/s must also make the declaration.	N/A	Each must make the declaration. Where there are Specialized Subcontractor/s, the Specialized Subcontractor/s must also make the declaration.	N/A	Form CON-3 E&S Performance Declaration
2.6	**Bank's SEA and/or SH Disqualification**	At the time of Contract Award, not subject to disqualification by the Bank for non-compliance with SEA/ SH obligations	Must meet requirement (including each subcontractor proposed by the Bidder)	N/A	Must meet requirement (including each subcontractor proposed by the Bidder)	N/A	Letter of Bid, Form CON-4
3. Financial Situation and Performance							

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

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

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	**Subject**	**Requirement**	**Single Entity**	**Joint Venture (existing or intended)**			**Submission Requirements**
				All Members Combined	**Each Member**	**Lead Member**	
3.1	**Financial Capabilities**	(i) The Bidder shall demonstrate that it has access to, or has available, liquid assets, unencumbered real assets, lines of credit, and other financial means (independent of any contractual advance payment) sufficient to meet the construction cash flow requirements estimated as follows for the subject contract(s) net of the Bidder's other commitments a. Lot 1:- 6 million USD b. Lot 2:- 7 million USD c. Lot 3:- 7 million USD d. Lot 1 and Lot 2 combined:- 13 million USD e. Lot 1 and Lot 3 combined:- 13 million USD f. Lot 2 and Lot 3 combined:- 14 million USD g. Lot 1, Lot 2 and Lot 3 combined:- 20 million USD	Must meet requirement Must meet requirement	Must meet requirement Must meet requirement	Must meet *25* % (Twenty five percent) of the requirement N/A Must meet requirement	Must meet *40%* (fourty percent) of the requirement N/A	Form FIN – 3.1, 3.2, 3.3, 3.4 with attachments
		(ii) The Bidders shall also demonstrate, to the	Must meet requirement	N/A			

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	**Subject**	**Requirement**	**Single Entity**	**Joint Venture (existing or intended)**			**Submission Requirements**
				All Members Combined	**Each Member**	**Lead Member**	
		satisfaction of the Employer, that it has adequate sources of finance to meet the cash flow requirements on works currently in progress and for future contract commitments. (iii) The audited balance sheets or, if not required by the laws of the Bidder's country, other financial statements acceptable to the Employer, for the last ***five*** years shall be submitted and must demonstrate the current soundness of the Bidder's financial position and indicate its prospective long-term profitability.				N/A	
3.2	**Average Annual Construction Turnover**	Minimum average annual construction turnover as follows is calculated as total certified payments received for contracts in progress and/or completed within the last five ***years***, divided by ***five***	Must meet requirement	Must meet requirement	Must meet *25* % (Twenty five percent) of the requirement	Must meet *40%* (fourty percent) of the requirement	Form FIN – 3.2

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	**Subject**	**Requirement**	**Single Entity**	**Joint Venture (existing or intended)**			**Submission Requirements**
				All Members Combined	**Each Member**	**Lead Member**	
		years. a. Lot 1:- 27 million USD b. Lot 2:- 31 million USD c. Lot 3:- 31 million USD d. Lot 1 and Lot 2 combined:- 58 million USD e. Lot 1 and Lot 3 combined:- 58 million USD f. Lot 2 and Lot 3 combined: - 62 million USD g. Lot 1, Lot 2 and Lot 3 combined:- 89 million USD					
4. Experience							
4.1	**General Construction Experience**	Experience under construction contracts in the role of prime contractor, JV member, Subcontractor, or management contractor *for at least last 5 (five) years.*	Must meet requirement	N/A	Must meet requirement	N/A	Form EXP – 4.1
4.2 (a)	**Specific Construction & Contract**	i)Participation as a contractor, joint venture member[5], or subcontractor,	Must meet requirement	Must meet requirement[8]	Must meet requirement as follows:	Must meet the requirement.	Form EXP 4.2(a)

[5] For contracts under which the Bidder participated as a joint venture member or Subcontractor, only the Bidder's share, by value, shall be considered to meet this requirement

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	Lead Member	
	Management Experience	in one road contract having four or more lane with at least 70 Lane-Kilometer that has been satisfactorily and substantially[6] completed[7] between 1st January **2016** and bid submission deadline and, where the value of the Bidder's participation exceeds as follows: - a. Lot 1: - 43 million USD b. Lot 2: - 50 million USD c. Lot 3:- 50 million USD d. Lot 1 and Lot 2 combined:- 93 million USD e. Lot 1 and Lot 3 combined:- 93 million USD f. Lot 2 and Lot 3 combined:-			Participation as a contractor, joint venture member[5], or subcontractor, in at least one multi-lane road/bridge contract that has been satisfactorily and substantially completed between 1st January 2016 and Bid submission deadline,		

[6] Substantial completion shall be based on 80% or more works physically completed, under the contract, substantiated by documentary evidence of Employer..

[7] In addition to the submission requirement Form EXP – 4.2 (a), the Bidder shall provide the following supporting documents:

Taking-Over Certificate, Contract Completion Certificate or Performance Certificate, other documents indicating physical completion of 80% or more in sufficient detail to verify the contract name, value and completion time (or substantial completion). If the documents are other than in English, an accurate translation of these documents in English shall be provided.].

[8] 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.

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	Lead Member	
		100 million USD g. Lot 1, Lot 2 and Lot 3 combined:- 143 million USD			where the value of bidder's participation exceeds 15% of the requirement.		
		ii. Participation as a contractor, joint venture member or subcontractor, at least in one Civil work contract under open international competition based on FIDIC or Multilateral Development Bank(MDB) contract document that has been satisfactorily and substantially completed , either in Nepal or in any other country outside the country of incorporation of the bidder, with minimum value of: a. Lot 1: 43 million USD b. Lot 2: 50 million USD	Must meet requirement	Must meet requirement	N/A	Must meet requirement	

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	**Subject**	**Requirement**	**Single Entity**	**Joint Venture (existing or intended)**			**Submission Requirements**
				All Members Combined	**Each Member**	**Lead Member**	
		c. Lot 3: 50 million USD d. Lot 1 and Lot 2 combined: 50 million USD e. Lot 1 and Lot 3 combined. 50 million USD f. Lot 2 and Lot 3 combined: 50 million USD g. Lot 1, Lot 2 and Lot 3 combined: 50 million USD *For this requirement whole contract value shall be considered even bidder was participated as JV member (the Bidder's share, by value, shall not be considered).*					
4.2 (b)		For the above and any other contracts [substantially completed and under implementation] as prime contractor, joint venture member, or Subcontractor between **1st January 2016** and Application submission deadline, a minimum construction experience in the following key activities	Must meet requirement	Must meet requirement	Must meet at least *15* % of the requirement of one of the activities in (i) or (ii)	Must meet at least *40* % of the requirement of one of the activities in (i) or (ii)	4.2 (b)

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	Lead Member	
		successfully completed[9]: (i) Production rate of Asphalt Concrete works of: a. Lot 1: 17,800 Cum per Year b. Lot 2: 22,300 Cum per Year c. Lot 3: 19,900 Cum per Year d. Lot 1 and Lot 2 combined: 40,100 Cum per Year e. Lot1 and Lot 3 combined. 37,700 Cum per Year f. Lot 2 and Lot 3 combined: 42,200 Cum per Year g. Lot1, Lot 2 and Lot 3 combined: 60,000 Cum per Year completed in any one year **between** 1st January 201**6and application submission deadline**. (ii) Production rate of construction of multilane bridge/ Viaduct of at least a. Lot 1: 340m length per Year b. Lot 2: 281 m length per Year . Lot 3: 179m length per Year					

[9] Volume, number or rate of production of any key activity can be demonstrated in one or more contracts are combined if executed during same time period.

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	Lead Member	
		d. Lot 1 and Lot 2 combined: 621 m length per Year e. Lot1 and Lot 3 combined. 519 m length per Year f. Lot 2 and Lot 3 combined: 460 m length per Year g. Lot1, Lot 2 and Lot 3 combined: 800 m per Year in any one year between 1st January 2016 and application submission deadline. ***Note:*** *When there is no evidence of specific period of execution in any contract, a. Asphalt concrete (AC) work including open, medium and dense graded bituminous macadam executed and b.cummulative length of bridges/viaducts constructed in each contract shall be considered completed over the entire contract period and average annual quantity of the AC work completed and length of bridge/viaduct completed shall be calculated accordingly.* *When evidence of period of execution of such activity is*					

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	**Subject**	**Requirement**	**Single Entity**	**Joint Venture (existing or intended)**			**Submission Requirements**
				All Members Combined	**Each Member**	**Lead Member**	
		produced, the quantity of the AC executed and cumulative length of bridge/viaduct completed in one year will be determined accordingly. Contract execution period less than one year shall also be considered as one year. *The rate of production shall be the annual production rate* ***(in any consecutive 12 months period*** *with****in the specified period shall be considered)*** *for the key construction activity (or activities).*					
4.2 (c)	**Specific Experience in managing E&S aspects**	For the contracts in 4.2 (a) above and/or any other contracts under implementation [at least 50% completed] as prime contractor, joint venture member, or Subcontractor between **1st January 2016** and Application submission deadline, experience in managing E&S risks and impacts in the following aspects: developed and implemented (50% of Works) and/or	Must meet requirement	Must meet requirement	N/A	N/A	Form EXP – 4.2 (c)

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	Lead Member	
		completed ESMP (C-ESMP) on road construction/improvement contracts of contract value USD 10 million or more. For contracts under which the Applicant participated as a joint venture member or sub-contractor, only the Applicant's share, by value, and role and responsibilities shall be considered to meet this requirement.					

5. Contractor's Representative and Key Personnel

The Bidder 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 Section VII- Works' Requirements Contractor's Representative and Key persons.

The Bidder shall provide details of the Contractor's Representative and Key Personnel and such other Key Personnel that the Bidder considers appropriate to perform the Contract, together with their academic qualifications and work experience. The Bidder shall complete the relevant Forms in Section IV, Bidding Forms.

The Contractor's representative shall be a full-time employee of the Bidder (in the case of joint ventures, of the Lead Member) for at least 1 year prior to the date of bid submission deadline. In the case of a joint venture, majority of the key personnel, as required under the Employer's Requirements, shall be from the lead member.

S.N	Position	Nos. Required for							Academic Qualification	Years Of Relevant work Experience
		Lot 1	Lot 2	Lot 3	Lot 1& 2	Lot 1& 3	Lot 2& 3	Lot 1, 2& 3		
1	Contractor's Representative/ Contract Manager	1	1	1	2	2	2	3	Bachelor's Degree in Relevant Discipline	a. The Contractor's representative shall be a full-time employee of the Bidder (in the case of joint ventures, of the Lead Member) for at least 1 year prior to the date of bid submission deadline. b. 10 years working experience on construction Contracts. c. Should be proficient in English.
2	Highway Engineer/ Civil Engineer	2	2	2	4	4	4	6	Bachelor's Degree in Civil/Highway Engineering	5 years working experience on Road Contracts of similar nature.
3	Structural/ Bridge Engineer	2	2	2	4	4	4	6	Bachelor's Degree in Civil/Structural Engineering	5 years working experience on bridge/structural works.
4	Environmental Specialist	1	1	1	2	2	2	3	Bachelor's Degree in Relevant environmental subject.	3 years working experience on environmental safeguard works.

5	Health and Safety Specialist	1	1	1	2	2	2	3	Bachelor's degree in relevant subject	2 years working experience on health and safety works.
6	Social Safeguard Specialist	1	1	1	2	2	2	3	Bachelor's degree in relevant subject	2 years working experience on social safeguard works

6. Equipment

The Bidder must demonstrate that it has access to the key equipment listed hereafter:

S. No.	Equipment Type and Characteristics	Minimum Number Required						
		Lot 1	Lot 2	Lot 3	Lot 1& 2	Lot 1& 3	Lot 2& 3	Lot 1, 2& 3
1	Pneumatic Roller (> 8 Ton)	5	5	5	8	8	8	10
2	Concrete Batch Plant (> 50 m3/hour)	2	2	2	4	4	4	5
3	Concrete Mixer Truck: (> 5 m3)	5	5	5	8	8	8	10
4	Asphalt Plant (> 90 tonne/hour)	2	2	2	4	4	4	5
5	Asphalt Paver with Electronic Sensor (> 3.0 m)	3	3	3	5	5	5	6

6	Crane (> 40 tonne)	2	2	2	2	2	2	4
7	Grader	4	4	4	7	7	7	9

The Bidder shall provide further details of proposed items of equipment using Form EQU in Section IV, Bidding Forms.

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Letter of Bid

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

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

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

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

Request for Bid No.: [*insert identification*]

Alternative No.: [*insert identification No if this is a Bid for an alternative*]

To:
The Department of Roads,
Development Cooperation Implementation Division,
Strategic Road Connectivity & Trade Improvement Project
Babarmahal, Kathmandu

We, the undersigned, declare that:

(a) **No reservations:** We have examined and have no reservations to the Bidding document, including Addenda issued in accordance with ITB 8;

(b) **Eligibility:** We meet the eligibility requirements and have no conflict of interest in accordance with ITB 4;

(c) **Bid-Securing Declaration:** We have not been suspended nor declared ineligible by the Employer based on execution of a Bid-Securing or Proposal-Securing Declaration in the Employer's Country in accordance with ITB 4.7;

(d) **Sexual Exploitation and Abuse (SEA) and/or Sexual Harassment (SH):** [*select the appropriate option from (i) to (v) below and delete the others*].

We *[where JV, insert:* "including any of our JV members"*]*, and any of our subcontractors:

(i) [have not been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations.]

(ii) [are subject to disqualification by the Bank for non-compliance with SEA/ SH obligations.]

(iii) [had been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations. An arbitral award on the disqualification case has been made in our favor.]

(iv) [had been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations for a period of two years. We have subsequently provided and demonstrated that we have adequate capacity and commitment to comply with SEA and SH prevention and response obligations.]

(v) [had been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations for a period of two years. We have attached documents demonstrating that we have adequate capacity and commitment to comply with SEA and SH prevention and response obligations.]

(e) **Conformity:** We offer to execute in conformity with the Bidding document and in accordance with the implementation and completion specified in the construction schedule, the following Works: *[insert a brief description of the Works]*;……

……;

(f) **Bid Price:** The total price of our Bid, excluding any discounts offered in item (g) below is: *[Insert one of the options below as appropriate]*

(i) Total price of our bid for Lot 3 is **NPR** ..... [*insert the total price in words and figures*];

(ii) Total price of our bid for Lot 1 & Lot 3 is **NPR** ..... [*insert the total price of all lots in words and figures*].

(iii) Total price of our bid for Lot 2 & Lot 3 is **NPR** ..... [*insert the total price of all lots in words and figures*].

(iv) Total price of our bid for Lot 1 & Lot 2 & Lot 3 is **NPR** ..... [*insert the total price of all lots in words and figures*].

Bidder shall ensure that the total amount indicated herein for all lots is the correct aggregation of total amounts as indicated separately under Letters of Bid for individual lots 1 and Lot 2. In case of any discrepancies in the total amounts, the total amount for individual lots as indicated in each Letter of Bid shall prevail subject to provisions under ITB 31 for arithmetical correction;

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

(i)We offer an unconditional discount of .....% in unit rates of Lot 3,

(ii) We offer an additional discount of .....% in unit rates of both the lots, if we are awarded both the Lot 1& Lot 3.[1]
(iii) We offer an additional discount of .....% in unit rates of both the lots, if we are awarded both the Lot 2 & Lot 3.[2]
(iv) We offer an additional discount of .....% in unit rates of all the three lots, if we are awarded all the three Lot 1, Lot 2 and Lot 3.[3]

The exact method of calculations to determine the net price after application of discounts is shown below which shall prevail in case of any discrepancies in net amounts derived based on percentage discounts indicated above and the method used to apply the discount: [*Specify in detail the method that shall be used to apply the discounts*];

(h) **Bid Validity**: Our Bid shall be valid until ……..*[insert day, month and year in accordance with ITB 18.1],* and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(i) **Performance Security** If our Bid is accepted, we commit to obtain a Performance Security [*and an Environmental and Social (E&S) Performance Security*] in accordance with the Bidding document;

(j) **One Bid Per Bidder:** We are not submitting any other Bid(s) as an individual Bidder, and we are not participating in any other Bid(s) as a Joint Venture member or as a subcontractor, and meet the requirements of ITB 4.3, other than alternative Bids submitted in accordance with ITB 13;

(k) **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 imposed by the World Bank Group or a debarment imposed by the World Bank Group in accordance with the Agreement for Mutual Enforcement of Debarment Decisions between the World Bank and other development banks. 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;

(l) **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 ITB 4.6*];

(m) **Commissions, gratuities, fees:** We have paid, or will pay the following commissions, gratuities, or fees with respect to the Bidding process or execution of the Contract: *[insert*

[1] If offered discount for awarding both Lots are found different in the letter of bid of Lot 1 and Lot3, then the higher value of offered discount shall be considered.
[2] If offered discount for awarding both Lots are found different in the letter of bid of Lot 2 and Lot 3, then the higher value of offered discount shall be considered.
[3] If offered discount for awarding all three contracts are found different in the letter of bid of Lot 1, Lot 2 and Lot 3, then the higher value of offered discount shall be considered

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Project Director

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.")

(n) **Binding Contract:** We understand that this Bid, 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;

(o) **Not Bound to Accept**: We understand that you are not bound to accept the lowest evaluated cost Bid, the Most Advantageous Bid or any other Bid that you may receive;

(p) **Fraud and Corruption:** 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 Fraud and Corruption;

(q) **Potential DAAB Members:** We hereby propose the following three persons, whose curriculum vitae are attached, as potential DAAB members:

Name	Address
1. …….	
2. …….	
3. ……	

Name of the Bidder: …….. ……..*[*insert name of the Bidder*]

Name of the person duly authorized to sign the Bid on behalf of the Bidder: …… ……..**[*insert complete name of person duly authorized to sign the Bid*]

Title of the person signing the Bid:…….. [*insert complete title of the person signing the Bid*]

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*]

Date signed _____ day of _____, _____

*: In the case of the Bid submitted by joint venture specify the name of the Joint Venture as Bidder

**: Person signing the Bid shall have the power of attorney given by the Bidder to be attached with the Bid

Appendix to Bid

Schedule of Cost Indexation

[The formulae for price adjustment shall be of the following general type:]

Pn= a + b Ln / Lo + c En/ Eo + d Mn/Mo + ...

where:

"Pn" 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 labour, equipment and materials;

"Ln", "En", "Mn", ... 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 49 days prior to the last day of the period (to which the particular Payment Certificate relates); and

"Lo", "Eo", "Mo", ... 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: $\mathbf{Z_0 / Z_1}$, where,

$\mathbf{Z_0}$ = 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

$\mathbf{Z_1}$ = 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

[In Tables A, B, and C, below, the Bidder shall (a) indicate its amount of local currency payment, (b) indicate its proposed source and base values of indices for the different foreign currency elements of cost, (c) derive its proposed weightings for local and foreign currency payment, and (d) list the exchange rates used in the currency conversion. In the case of very large and/or complex works contracts, it may be necessary to specify several families of price adjustment formulae corresponding to the different works involved.]

Table A. Local Currency

Index code*	Index description*	Source of index*	Base value and date*	Bidder's related currency amount	Range of weighing	Bidder's proposed weighting
A	Non adjustable	—	—	—	A: 0.15	**0.15**
B	Construction Labour	Nepal Rastra Bank (National Salary and Wage Rate Index - Construction Labour)	28 days prior to deadline of submission of bids		B: 0.15 - 0.25	
C	Fuel, Oil and Lubricants	Nepal Oil Corporation (Diesel Price, Thankot)	28 days prior to deadline of submission of bids		C: 0.10 - 0.20	
D	Construction Material	Nepal Rastra Bank (National Wholesale Price Index – Construction Material)	28 days prior to deadline of submission of bids		D: 0.4 0– 0.50	
E	Machinery and Equipment	Nepal Rastra Bank (National Wholesale Price Index – Construction Machinery and Equipment)	28 days prior to deadline of submission of bids		E: 0.05 - 0.10	
				Total		**1.00**

Note:

1. The Bidder will be required to specify weightings within the range such that the total weightings = 1.00.

Table B. Foreign Currency (FC)

State type: ..... [If the Bidder is allowed to receive payment in foreign currencies this table shall be used. If Bidder wishes to quote in more than one foreign currency (up to three currencies permitted) then this table should be repeated for each foreign currency.]

Index code	Index description	Source of index	Base value and date	Bidder's related source currency in type/amount	Equivalent in FC1	Range of weighing	Bidder's proposed weighting
A	Nonadjustable	—	—	—		**A: 0.15**	**0.15**
				Total			**1.00**

Note:

1. The Bidder shall complete the above table for indices as applicable.

2. The Bidder will be required to specify weightings within the range such that the total weightings = 1.00.

Table C. Summary of Payment Currencies

Table: Alternative A

Name of payment currency	A Amount of currency	B Rate of exchange (local currency per unit of foreign)	C Local currency equivalent C = A x B	D Percentage of Total Bid Price (TBP) 100xC / TBP
Local currency _____		1.00		
Foreign currency #1 _____				
Foreign currency #2 _____				
Foreign currency #3 _____				
Total Bid Price				100.00
Provisional sums expressed in local currency	350,736,000.00	1.00	350,736,000.00	
TOTAL BID PRICE (including provisional sum)				

Note:
Bidders 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 Bid are reasonable, in which case a detailed breakdown of the foreign currency requirements shall be provided by Bidders.

Bill of Quantities

Notes for Preparing a Bill of Quantities

These Notes for Preparing a Bill of Quantities are intended only as information for the Employer or the person drafting the bidding documents. They should not be included in the final documents.

Objectives

The objectives of the Bill of Quantities are

(a) to provide sufficient information on the quantities of Works to be performed to enable bids to be prepared efficiently and accurately; and

(b) when a contract has been entered into, to provide a priced Bill of Quantities for use in the periodic valuation of Works executed.

In order to attain these objectives, Works should be itemized in the Bill of Quantities in sufficient detail to distinguish between the different classes of Works, or between Works of the same nature carried out in different locations or in other circumstances which may give rise to different considerations of cost. Consistent with these requirements, the layout and content of the Bill of Quantities should be as simple and brief as possible.

Content

The Bill of Quantities should be divided generally into the following sections:

(a) Preamble;

(b) Work Items (grouped into parts);

(c) Daywork Schedule; and

(d) Summary.

Preamble

The Preamble should indicate the inclusiveness of the unit prices and should state the methods of measurement that have been adopted in the preparation of the Bill of Quantities and that are to be used for the measurement of any part of the Works.

Rock

Where excavation, boring, or driving is included in the Works, a comprehensive definition of rock (always a contentious topic in contract administration), should be provided in the Technical Specification and this definition should be used for the purposes of measurement and payment.

Work Items

The items in the Bill of Quantities should be grouped into sections to distinguish between those parts of the Works that by nature, location, access, timing, or any other special characteristics may give rise to different methods of construction, phasing of the Works, or considerations of cost. General items common to all parts of the Works may be grouped as a separate section in the Bill of Quantities. When a family of Price Adjustment Formulae are used, they should relate to appropriate sections in the Bill of Quantities.

Quantities

Quantities should be computed net from the Drawings, unless directed otherwise in the Contract, and no allowance should be made for bulking, shrinkage, or waste. Quantities should be rounded up or down where appropriate and spurious accuracy should be avoided.

Units of Measurement

The following units of measurement and abbreviations are recommended for use (unless other national units are mandatory in the country of the Employer).

Unit	Abbreviation	Unit	Abbreviation
cubic meter	m^3 *or* cu m	millimeter	mm
hectare	ha	month	mon
hour	hr	number	nos
kilogram	kg	square meter	m^2 *or* sq m
lump sum	LS	square millimeter	mm^2 *or* sq mm
meter	m	week	wk
metric ton	MT or ton,	Provisional Sum	PS
(1,000 kg)		Vehicle Month	Veh-Month
Liter	Ltr	Man Day	M-day
Kilometer Month	Km-month		

Ground and Excavation Levels

The commencing surface should be identified in the description of each item for work involving excavation, boring, or driving, for which the commencing surface is not also the original surface. The excavated surface should be identified in the description of each item for work involving excavation for which the excavated surface is not also the final surface. The depths of work should be measured from the commencing surface to the excavated surface, as defined.

Daywork Schedule

A Daywork Schedule should be included if the probability of unforeseen work, outside the items included in the Bill of Quantities, is relatively high. To facilitate checking by the Employer of the realism of rates quoted by the bidders, the Daywork Schedule should normally comprise:

(a) a list of the various classes of labour, materials, and Contractor's Equipment for which basic Daywork rates or prices are to be inserted by the bidder, together with a statement of the conditions under which the Contractor will be paid for work executed on a Daywork basis; and

(b) a percentage to be entered by the bidder against each basic Daywork Subtotal amount for labour, materials, and Plant representing the Contractor's profit, overheads, supervision, and other charges.

Provisional Quantities and Sums

Provision for quantity contingencies in any particular item or class of work with a high expectation of quantity overrun should be made by entering specific "Provisional Quantities" or "Provisional Items" in

the Bill of Quantities, and *not* by increasing the quantities for that item or class of work beyond those of the work normally expected to be required. To the extent not covered above, a general provision for physical contingencies (quantity overruns) should be made by including a "Provisional Sum" in the Summary of the Bill of Quantities. Similarly, a contingency allowance for possible price increases should be provided as a "Provisional Sum" in the Summary of the Bill of Quantities. The inclusion of such Provisional Sums often facilitates budgetary approval by avoiding the need to request periodic supplementary approvals as the future need arises.

The estimated cost of specialized work to be carried out, or of special goods to be supplied, by a Nominated Subcontractor should be specified in the relevant part of the Bill of Quantities as a particular Provisional Sum with an appropriate brief description. A separate bidding procedure is normally carried out by the Employer to select the specialists, who are then nominated as subcontractors to the main or prime contractor. To provide an element of competition among the main bidders (or prime contractors) in respect of any facilities, amenities, attendance, etc., to be provided by the successful bidder as prime contractor for the use and convenience of the specialist or nominated subcontractor, each related Provisional Sum should be following by an item in the Bill of Quantities inviting a percentage (to be quoted by the main bidder) payable on the actual expenditure from the Provisional Sum.

The provisional sums shall also include an estimated amount to cover the Employer's portion (50%) of DAAB's fees and expenses.

Summary

The Summary should contain a tabulation of the separate parts of the Bill of Quantities carried forward, with provisional sums for Daywork, for physical (quantity) contingencies, and for price contingencies (upward price adjustment) where applicable, including DAAB fees and expenses.

Sample Bill of Quantities

A. Preamble

1. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, General and Particular Conditions, Technical Specifications, and Drawings.
2. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices bid 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 bid 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.
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-Clauses 13.4 and 13.5 of the General Conditions except with respect to DAAB Fees and Expenses for which no instruction will be required from the Engineer.
8. The method of measurement of completed work for payment shall be in accordance with *Special Provision and Standard Specification for Road and Bridge Works published by the Department of Roads, 2073 (with Amendments 2075 BS).*

B. Work Items

1. The Bill of Quantities usually contains the following part Bills, which have been grouped according to the nature or timing of the work:

PART 1 Provisional Sums

PART 2 General

PART 3 Road Works

PART 3.1 Site Clearance

PART 3.2 Earthwork

PART 3.3 Pavement Works

PART 3.4 Structures(Retaining wall, Side Drains, Cross Drainage Structures)

PART 3.5 Road Furniture and Traffic Safety Measures

PART 3.6 Bridge Repair and Rehabilitation

PART 3.7 Performance Based Woks

PART 3.8 Day Works

PART 3.9 Miscellaneous Works

PART 4 Bridge Construction Works

PART 4.1 Foundation

PART 4.2 Sub Structure Works

PART 4.2 Super Structure Works

PART 4.3 Approach Roads and Protection Works

2. BDS-ITB 15.1 (a) applies, Bidders shall price the Bill of Quantities in local currency only and shall indicate in the Appendix to Bid the percentage expected for payment in foreign currency or currencies.

Bill of Quantities

Please Refer the BOQ attached at the end of this document.

Day-work Schedule

General

1. Reference should be made to Sub-Clause 13.5 of the General Conditions. Work shall not be executed on a daywork basis except by written order of the Engineer. Bidders shall enter basic rates for daywork items in the Schedules, which rates shall apply to any quantity of daywork ordered by the Engineer. Nominal quantities have been indicated against each item of daywork, and the extended total for Daywork shall be carried forward as a Provisional Sum to the Summary Total Bid Amount. Unless otherwise adjusted, payments for daywork shall be subject to price adjustment in accordance with the provisions in the Conditions of Contract.

Daywork Labour

2. In calculating payments due to the Contractor for the execution of daywork, the hours for labour will be reckoned from the time of arrival of the labour at the job site to execute the particular item of daywork to the time of return to the original place of departure, but excluding meal breaks and rest periods. Only the time of classes of labour directly doing work ordered by the Engineer and for which they are competent to perform will be measured. The time of gangers (charge hands) actually doing work with the gangs will also be measured but not the time of foremen or other supervisory personnel.

3. The Contractor shall be entitled to payment in respect of the total time that labour is employed on daywork, calculated at the basic rates entered by the Contractor in the **Schedule of Daywork Rates: 1. Labour,** together with an additional percentage payment on basic rates representing the Contractor's profit, overheads, etc.,

Daywork Materials

4. The Contractor shall be entitled to payment in respect of materials used for daywork (except for materials for which the cost is included in the percentage addition to labour costs as detailed heretofore), at the basic rates entered by the Contractor in the **Schedule of Daywork Rates: 2. Materials,** together with an additional percentage payment on the basic rates to cover overhead charges and profit.

Daywork Contractor's Equipment

5. The Contractor shall be entitled to payments in respect of Contractor's Equipment already on Site and employed on daywork at the basic rental rates entered by the Contractor in the **Schedule of Daywork Rates: 3. Contractor's Equipment.** Said rates shall be deemed to include due and complete allowance for depreciation, interest, indemnity, and insurance, repairs, maintenance, supplies, fuel, lubricants, and other consumables, and all overhead, profit, and administrative costs related to the use of such equipment.

6. In calculating the payment due to the Contractor for Contractor's Equipment employed on daywork, only the actual number of working hours will be eligible for payment, except that where applicable and agreed with the Engineer, the travelling time from the part of the Site where the Contractor's Equipment was located when ordered by the Engineer to be employed on daywork and the time for return journey thereto shall be included for payment.

Dr. Bijaya Jaishi
Project Director

Grand Summary

Contract Name:

Contract No.:

General Summary	*Page*	*Amount*
PART 1 Provisional Sums		
PART 2 General		
PART 3 Road Works		
PART 3.1 Site Clearance		
PART 3.2 Earthwork		
PART 3.3 Pavement Works		
PART 3.4 Structures(Retaining wall, Side Drains, Cross Drainage Structures)		
PART 3.5 Road Furniture and Traffic Safety Measures		
PART 3.6 Bridge Repair and Rehabilitation		
PART 3.7 Performance Based Woks		
PART 3.8 Day Works		
PART 3.9 Miscellaneous Works		
PART 4 Bridge Construction Works		
PART 4.1 Foundation		
PART 4.2 Sub Structure Works		
PART 4.2 Super Structure Works		
PART 4.3 Approach Roads and Protection Works		
Subtotal of Bills	*(A)*	
VAT @13%	*(B)*	
Total including PS and VAT		

* For evaluation purposes, Provisional Sum will be excluded

Technical Proposal

- **Site Organization**
- **Method Statement**
- **Mobilization Schedule**
- **Construction Schedule**
- **ES Management Strategies and Implementation Plans**
- **Code of Conduct for Contractor's Personnel (E&S)**
- **Equipment**
- **Key Personnel Schedule**
- **Others**

Site Organization

[insert Site Organization information]

Method Statement

[insert Method Statement]

Mobilization Schedule

[insert Mobilization Schedule]

In accordance with the Particular Conditions, Sub-Clause 4.1, the Contractor shall not carry out mobilization to Site unless the Engineer gives consent that appropriate measures are in place to address environmental and social risks and impacts, which as 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 Bid and agreed as part of the Contract.

Construction Schedule

[Insert Construction Schedule]

The construction schedule shall include the following key milestones:

- *No-objection to the Contractor's MSIPs, which collectively form the C-ESMP, in accordance with the Particular Conditions – Special provisions Sub-Clause 4.1.*
- *Constitution of the DAAB*

E&S Management Strategies and Implementation Plans (ES-MSIP)

The Bidder shall submit comprehensive and concise Environmental and Social Management Strategies and Implementation Plans (ES-MSIP) as required by ITB 11.1 (h) of the Bid 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 Bidder shall have regard to the E&S provisions of the contract including those as may be more fully described in the **Works Requirements in Section VII**.

Code of Conduct for Contractor's Personnel (E&S) Form

Note to the Bidder:

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

The Bidder shall initial and submit the Code of Conduct form as part of its bid.

CODE OF CONDUCT FOR CONTRACTOR'S PERSONNEL

We are the Contractor, [*enter name of Contractor*]. We have signed a contract with [*enter name of Employer*] for [*enter 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 Works, including the risks of sexual exploitation, sexual abuse and sexual harassment.

This Code of Conduct is part of our measures to deal with environmental and social risks related to the Works. It applies to all our staff, labourers 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 behavior that we require from all Contractor's Personnel.

Our workplace is an environment where unsafe, offensive, abusive or violent behavior will not be tolerated and where all persons should feel comfortable raising issues or concerns without fear of retaliation.

REQUIRED CONDUCT

Contractor's Personnel shall:

1. carry out his/her duties competently and diligently;
2. 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 Personnel and any other person;
3. maintain a safe working environment including by:
    a. ensuring that workplaces, machinery, equipment and processes under each person's control are safe and without risk to health;
    b. wearing required personal protective equipment;
    c. using appropriate measures relating to chemical, physical and biological substances and agents; and

d. following applicable emergency operating procedures.

4. report work situations that he/she believes are not safe or healthy and remove himself/herself from a work situation which he/she reasonably believes presents an imminent and serious danger to his/her life or health;
5. treat other people with respect, and not discriminate against specific groups such as women, people with disabilities, migrant workers or children;
6. not engage in Sexual Harassment, which means unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature with other Contractor's or Employer's Personnel;
7. not engage in Sexual Exploitation, 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;
8. not engage in Sexual Abuse, which means the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions;
9. not engage in chasing or hunting or capture of wildlife including birds and fishing and, refrain from acquiring wildlife meat, skins, feathers, or any similar products derived from wildlife.
10. Not engage in encroaching upon or degrading of forests as well as the collection and harvesting of forest resources such as firewood, herbs, timber and non-timber forest products among others.
11. not engage in any form of sexual activity with individuals under the age of 18, except in case of pre-existing marriage;
12. complete relevant training courses that will be provided related to the environmental and social aspects of the Contract, including on health and safety matters, Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH);
13. report violations of this Code of Conduct; and
14. not retaliate against any person who reports violations of this Code of Conduct, whether to us or the Employer, or who makes use of the grievance mechanism for Contractor's Personnel or the project's Grievance Redress Mechanism.
15. Not engage in any form of sexual activity with children under the age of 18 - including contact through digital media. Mistaken belief regarding the age of a child is not a defense. Consent from the child is also not a defense or excuse.
16. In responding to any reporting of SEA/SH/VAC, everyone should follow the project SEA/SH GRM procedure and process. Individuals/employees experiencing any forms of GBV, including SEA/SH is supported by facilitating access to specialist services in accordance with the SEA/SH GRM procedure and records will be kept in confidentiality.

RAISING CONCERNS

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

1. Contact [*enter name of the Contractor's Social Expert with relevant experience in handling gender-based violence, or if such person is not required under the Contract, another individual designated by the Contractor to handle these matters*] in writing at this address [……] or by telephone at [……] or in person at [……..]; or
2. Call [……..] to reach the Contractor's hotline *(if any)* and leave a message.

The person'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.

FOR CONTRACTOR'S PERSONNEL:

I have received a copy of this Code of Conduct written in a language that I comprehend. I understand that if I have any questions about this Code of Conduct, I can contact [*enter name of Contractor's contact person(s) with relevant experience*] requesting an explanation.

Name of Contractor's Personnel: [insert name]

Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Contractor:

Signature: _____

Date: (day month year): _____

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

ATTACHMENT 1 TO THE CODE OF CONDUCT FORM

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.

(a) Examples of sexual exploitation and abuse include, but are not limited to:

- A Contractor's Personnel tells a member of the community that he/she can get them jobs related to the work site (e.g. cooking and cleaning) in exchange for sex.
- A Contractor's Personnel that is connecting electricity input to households says that he can connect women headed households to the grid in exchange for sex.
- A Contractor's Personnel rapes, or otherwise sexually assaults a member of the community.
- A Contractor's Personnel denies a person access to the Site unless he/she performs a sexual favor.
- A Contractor's Personnel 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.

(b) Examples of sexual harassment in a work context

- Contractor's Personnel comment on the appearance of another Contractor's Personnel (either positive or negative) and sexual desirability.
- When a Contractor's Personnel complains about comments made by another Contractor's Personnel on his/her appearance, the other Contractor's Personnel comment that he/she is "asking for it" because of how he/she dresses.
- Unwelcome touching of a Contractor's or Employer's Personnel by another Contractor's Personnel.
- A Contractor's Personnel tells another Contractor's Personnel that he/she will get him/her a salary raise, or promotion if he/she sends him/her naked photographs of himself/herself.

(C) Examples of Child SEA:

- A worker befriends a child/adolescent under 18, supporting their family in exchange for sexual favors
- A worker always passes comments to schoolgirls on a pedestrian rural road adjacent to the
- A project worker often buys treats to lure an adolescent to go with him to another village/town.

Form EQU: Equipment

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

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 ☐ Owned ☐ Rented ☐ Leased ☐ Specially manufactured	

Omit the following information for equipment owned by the Bidder.

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	

Form PER -1
Contractor's Representative and Key Personnel Schedule

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

	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]
6.	**Title of position:** *[insert title]*	[Structural/Bridge Engineer]
	Name of candidate	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]

Form PER-2:

Resume and Declaration

Contractor's Representative and Key Personnel

Name of Bidder:.....		
Position [#*1*]: [*title of position from Form PER-1*]		
Personnel information	**Name:**	**Date of birth:**
	Address:	**E-mail:**
	Professional qualifications:	
	Academic qualifications:	
	Language proficiency:*[language and levels of speaking, reading and writing skills]*	
Details		
	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
[main project details]	*[role and responsibilities on the project]*	*[time in role]*	*[describe the experience relevant to this position]*

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 Bid:

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

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

1. be taken into consideration during Bid evaluation;
2. result in my disqualification from participating in the Bid;
3. 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 Bidder:

Signature: ……..

Date: (day month year): ……..

Bidders Qualification without prequalification

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

Form ELI -1.1

Bidder Information Form

Date: ……

RFB No. and title: …….
Page…….of ……pages

Bidder's name: ……..
In case of Joint Venture (JV), name of each member:…….
Bidder's actual or intended country of registration:…… *[indicate country of Constitution]*
Bidder's actual or intended year of incorporation:…….
Bidder's legal address [in country of registration]:…….
Bidder's authorized representative information Name: ……. Address: …… Telephone/Fax numbers: …… E-mail address: ……..
1. Attached are copies of original documents of ☐ Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of registration of the legal entity named above, in accordance with ITB 4.4. ☐ In case of JV, letter of intent to form JV or JV agreement, in accordance with ITB 4.1. ☐ In case of state-owned enterprise or institution, in accordance with ITB 4.6 documents establishing: • Legal and financial autonomy • Operation under commercial law • Establishing that the Bidder is not under the supervision of the Employer 2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership. *[If required under BDS ITB 47.1, the successful Bidder shall provide additional information on beneficial ownership, using the Beneficial Ownership Disclosure Form.]*

Dr. Bijaya Jaishi
Project Director

Form ELI -1.2

Bidder's JV Information Form

(to be completed for each member of Bidder's JV)

Date: …….
RFB No. and title: ……..
Page……. of ……..pages

Bidder'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 ☐ Articles of Incorporation (or equivalent documents of constitution or association), and/or registration documents of the legal entity named above, in accordance with ITB 4.4. ☐ In case of a state-owned enterprise or institution, documents establishing legal and financial autonomy, operation in accordance with commercial law, and that they are not under the supervision of the Employer, in accordance with ITB 4.6. 2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership. *[If required under BDS ITB 47.1, the successful Bidder shall provide additional information on beneficial ownership for each JV member using the Beneficial Ownership Disclosure Form.]*

Form CON – 2

Historical Contract Non-Performance, Pending Litigation and Litigation History

Bidder's Name: ……
Date: ……
JV Member's Name:……
RFB No. and title: ……

Page ……of ……pages

Non-Performed Contracts in accordance with Section III, Evaluation and Qualification Criteria			
-3Contract non-performance did not occur since 1st January *[insert year]* ☐ Contract(s) not performed since 1st January *[insert year]*			
Year	**Non-performed portion of contract**	**Contract Identification**	**Total Contract Amount (current value, currency, exchange rate and US$ equivalent)**
[insert year]	*[insert amount and percentage]*	**Contract Identification:** *[indicate complete contract name/ number, and any other identification]* **Name of Employer:** *[insert full name]* **Address of Employer:** *[insert street/city/country]* **Reason(s) for nonperformance:** *[indicate main reason(s)]*	*[insert amount]*
Pending Litigation, in accordance with Section III, Evaluation and Qualification Criteria.			
☐ No pending litigation ☐ Pending litigation			

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:** ……	
Litigation History in accordance with Section III, Evaluation and Qualification Criteria .			
☐ No Litigation History ☐ Litigation History			
Year of award	**Outcome as percentage of Net Worth**	**Contract Identification**	**Total Contract Amount (currency), USD Equivalent (exchange rate)**
[insert year]	*[insert percentage]*	**Contract Identification:** *[indicate complete contract name, number, and any other identification]* **Name of Employer:** *[insert full name]* **Address of Employer:** *[insert street/city/country]* **Matter in dispute**: *[indicate main issues in dispute]* **Party who initiated the dispute**: *[indicate "Employer" or "Contractor"]* Reason(s) for Litigation and award decision *[indicate main reason(s)]*	*[insert amount]*

Form CON – 3

Environmental and Social Performance Declaration

Bidder's Name: ……
Date:……
Joint Venture Member's or Specialized Subcontractor's Name: ……
RFB No. and title: ……

Page:…… of …… pages

Environmental and Social Performance Declaration in accordance with Section III, Qualification Criteria, and Requirements
☐ **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 and Social (E&S) performance since the date specified in Section III, Qualification Criteria, and Requirements, Sub-Factor 2.5. ☐ **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 and Social (E&S) performance since the date specified in Section III, Qualification Criteria, and Requirements, Sub-Factor 2.5. Details are described below:

Year	Suspended or terminated portion of contract	Contract Identification	Total Contract Amount (current value, currency, exchange rate and US$ equivalent)
[insert year]	*[insert amount and percentage]*	**Contract Identification:** *[indicate complete contract name/ number, and any other identification]* **Name of Employer:** *[insert full name]* **Address of Employer:** *[insert street/city/country]* **Reason(s) for suspension or termination:** *[indicate main reason(s) e.g. gender-based violence; sexual exploitation or sexual abuse breaches]*	*[insert amount]*
[insert year]	*[insert amount and percentage]*	**Contract Identification:** *[indicate complete contract name/ number, and any other identification]* **Name of Employer:** *[insert full name]* **Address of Employer:** *[insert street/city/country]* Reason(s) for suspension or termination: *[indicate main reason(s)]*	*[insert amount]*
…	…	*[list all applicable contracts]*	…

Performance Security called by an employer(s) for reasons related to E&S performance

Year	Contract Identification	Total Contract Amount (current

		value, currency, exchange rate and US$ equivalent)
[insert year]	**Contract Identification:** *[indicate complete contract name/ number, and any other identification]* **Name of Employer:** *[insert full name]* **Address of Employer:** *[insert street/city/country]* Reason(s) for calling of performance security: *[indicate main reason(s) e.g. gender-based violence; sexual exploitation or sexual abuse breaches]*	*[insert amount]*

Form CON – 4
Sexual Exploitation and Abuse (SEA) and/or Sexual Harassment Performance Declaration

[The following table shall be filled in by the Bidder, each member of a Joint Venture and each subcontractor proposed by the Bidder]

Bidder's Name: ……
Date:……
Joint Venture Member's or Specialized Subcontractor's Name: ……
RFB No. and title: ……

Page:…… of …… pages

SEA and/or SH Declaration in accordance with Section III, Qualification Criteria, and Requirements
We: ☐ (a) have not been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations ☐ (b) are subject to disqualification by the Bank for non-compliance with SEA/ SH obligations ☐ (c) had been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations. An arbitral award on the disqualification case has been made in our favor. ☐ (d)had been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations for a period of two years. We have subsequently demonstrated that we have adequate capacity and commitment to comply with SEA/ SH obligations. ☐ (e) had been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations for a period of two years. We have attached evidence demonstrating that we have adequate capacity and commitment to comply with SEA/ SH obligations.
[*If (c) above is applicable, attach evidence of an arbitral award reversing the findings on the issues underlying the disqualification.]*
[If (d) or (e) above are applicable, provide the following information:]
Period of disqualification: From: _____ To: _____
If previously provided on another Bank financed works contract, details of evidence that demonstrated adequate capacity and commitment to comply with SEA/ SH obligations (**as per (d) above)** Name of Employer: _____ Name of Project: _____ Contract description: _____ Brief summary of evidence provided: _____ _____ Contact Information: (Tel, email, name of contact person): _____ _____
As an alternative to the evidence under (d), other evidence demonstrating adequate capacity and commitment to comply with SEA/ SH obligations (**as per (e) above)** *[attach details as appropriate].*

Form FIN – 3.1

Financial Situation and Performance

Bidder's Name: ……
Date:……
Joint Venture Member's or Specialized Subcontractor's Name: ……
RFB 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)					
Current Assets (CA)					
Current Liabilities (CL)					
Working Capital (WC)					

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

2. Sources of Finance

Specify sources of finance to meet the cash flow requirements on works currently in progress and for future contract commitments.

No.	Source of finance	Amount (US$ equivalent)
1		
2		
3		

3. Financial documents

The Bidder and its parties shall provide copies of financial statements for ***5*** years pursuant Section III, Evaluation and Qualifications Criteria, Sub-factor 3.1.

The financial statements shall:

(a) reflect the financial situation of the Bidder 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.
(d) correspond to accounting periods already completed and audited.

☐Attached are copies of financial statements[1] for the *5* years required above; and complying with the requirements

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

Dr. Bijaya Jaishi
Project Director

Form FIN - 3.2

Average Annual Construction Turnover

Bidder's Name: ……
Date:……
Joint Venture Member's or Specialized Subcontractor's Name: ……
RFB No. and title: ……

Page:…… of …… pages

		Annual turnover data (construction only)	
Year	**Amount Currency**	**Exchange rate**	**USD equivalent**
[indicate year]	*[insert amount and indicate currency]*		
Average Annual Construction Turnover *			

* See Section III, Evaluation and Qualification Criteria, Sub-Factor 3.2.

Form FIN – 3.3:

Financial Resources

Specify proposed sources of financing, such as liquid assets, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject contract or contracts as specified in Section III, Evaluation and Qualification Criteria.

Line of credit shall be substantiated by a letter from the bank issuing the line of credit. In case of Credit Line, only the unutilized credit limit and overdraft facilities shall be considered.

Financial Resources		
No.	**Source of financing**	**Amount (US$ equivalent)**
1		
2		
3		

Form FIN – 3.4:

Current Contract Commitments / Works in Progress

Bidders 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.

Current Contract Commitments					
No.	**Name of Contract**	**Employer's Contact Address, Tel, Fax**	**Value of Outstanding Work [Current US$ Equivalent]**	**Estimated Completion Date**	**Average Monthly Invoicing Over Last Six Months [US$/month)]**
1					
2					
3					
4					
5					
…					
…					
				TOTAL =	

Dr. Bijaya Jaishi
Project Director

Form EXP - 4.1

General Construction Experience

Bidder's Name: ……
Date: ……
JV Member's Name:……
RFB No. and title: ……

Page …….of ……pages

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

Form EXP - 4.2(a1)

Specific Construction and Contract Management Experience

Bidder's Name: ……
Date: ……
JV Member's Name:……
RFB No. and title: ……

Page …….of ……pages

Similar Contract No.	**Information**			
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor ☐	Member in JV ☐	Management Contractor ☐	Subcontractor ☐
Total Contract Amount			US$	
If member in a JV or Subcontractor, specify participation in total Contract amount				
Employer's Name:				
Address: Telephone/fax number E-mail:				

Form EXP - 4.2(a) (cont.)

Specific Construction and Contract Management Experience (cont.)

Similar Contract No.	Information
Description of the similarity in accordance with Sub-Factor 4.2(a) of Section III:	
1. Amount	
2. Physical size of required works items	
3. Complexity	
4. Methods/Technology	
5. Construction rate for key activities	
6. Other Characteristics	

Note:

The bidder shall attach the substantiating document (e.g. Completion certificate by the Employer)

Form EXP - 4.2(a2)

Specific Construction and Contract Management **Experience outside the country of incorporation of bidder**

Bidder's Name: ……
Date: ……
JV Member's Name:……
RFB No. and title: ……

Page …….of ……pages

Contract No.	**Information**			
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor ☐	Member in JV ☐	Management Contractor ☐	Subcontractor ☐
Total Contract Amount			US$	
Contract Type				
If member in a JV or Subcontractor, specify participation in total Contract amount				
Employer's Name:				
Address: Telephone/fax number E-mail:				

Form EXP - 4.2(a2) (cont.)

Specific Construction and Contract Management Experience (cont.)

Similar Contract No.	Information
Description of the similarity in accordance with Sub-Factor 4.2(a) of Section III:	
1. Amount	
2. Physical size of required works items	
3. Complexity	
4. Methods/Technology	
5. Construction rate for key activities	
6. Other Characteristics	

Note:

The bidder shall attach the substantiating document (e.g. Completion certificate by the Employer)

Form EXP - 4.2(b1)

Construction Experience in Key Activities

Bidder's Name: ……
Date: ……
JV Member's Name:……
Subcontractor's Name[2] (as per ITB 34):
……..
RFB No. and title: ……

Page …….of ……pages

All Subcontractors for key activities must complete the information in this form as per ITB 34 and Section III, Evaluation and Qualification Criteria, Sub-Factor 4.2.

1. Key Activity No. One: _____

	Information			
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor ☐	Member in JV ☐	Management Contractor ☐	Subcontractor ☐
Total Contract Amount			US$	
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				
Employer's Name:				

if applicable

	Information
Address: Telephone/fax number E-mail:	

	Information
Description of the key activities in accordance with Sub-Factor 4.2(b) of Section III:	

Note:

The bidder shall attach the substantiating document (e.g. Completion certificate by the Employer)

Form EXP - 4.2(b2)

Construction Experience in Key Activities

Bidder's Name: ……
Date: ……
JV Member's Name:……
Subcontractor's Name[3] (as per ITB 34):
……..
RFB No. and title: ……

Page …….of ……pages

All Subcontractors for key activities must complete the information in this form as per ITB 34 and Section III, Evaluation and Qualification Criteria, Sub-Factor 4.2.

1. Key Activity No. Two: _____

	Information			
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor ☐	Member in JV ☐	Management Contractor ☐	Subcontractor ☐
Total Contract Amount			US$	
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				

[3] If applicable

	Information		
Year 2			
Year 3			
Year 4			
Employer's Name:			
Address: Telephone/fax number E-mail:			

	Information
Description of the key activities in accordance with Sub-Factor 4.2(b) of Section III:	

Note:

The bidder shall attach the substantiating document (e.g. Completion certificate by the Employer)

Form EXP - 4.2(c)

Specific Experience in Managing E&S aspects

[The following table shall be filled in for contracts performed by the Bidder, and each member of a Joint Venture]

(a) **Bidder's Name:**
……
Date: ……
JV Member's Name:……
RFB No. and title: ……

Page ……of ……pages

1. Key Requirement no 1 in accordance with 4.2 (c): _____

Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor ☐	Member in JV ☐	Management Contractor ☐	Subcontractor ☐
Total Contract Amount			US$	
Details of relevant experience				

2. Key Requirement no 2 in accordance with 4.2 (c): _____

3. …..

Note:

The bidder shall attach the substantiating documents.

Form of Bid Security - Demand Guarantee

Beneficiary: ……..
Request for Bids No: …….
Date: …….
BID GUARANTEE No.: …….
Guarantor: …….

We have been informed that ……(hereinafter called "the Applicant") has submitted or will submit to the Beneficiary its Bid (hereinafter called "the Bid") for the execution of…… under Request for Bids No. ……("the RFB").

Furthermore, we understand that, according to the Beneficiary's conditions, Bids must be supported by a Bid 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 Bid prior to the Bid validity expiry date set forth in the Applicant's Letter of Bid, or any extended date provided by the Applicant; or

(b) having been notified of the acceptance of its Bid by the Beneficiary prior to the expiry date of the Bid validity 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 and, if required, the Environmental and Social (E&S) Performance Security, in accordance with the Instructions to Bidders ("ITB") of the Beneficiary's Bidding document.

This guarantee will expire: (a) if the Applicant is the successful Bidder, upon our receipt of copies of the contract agreement signed by the Applicant and the Performance Security and, if required, the Environmental and Social (E&S) Performance Security, issued to the Beneficiary in relation to such contract agreement; or (b) if the Applicant is not the successful Bidder, upon the earlier of (i) our receipt of a copy of the Beneficiary's notification to the Applicant of the results of the Bidding process; or (ii) twenty-eight days after the expiry date of the Bid validity.

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 Sexual Exploitation and Abuse (SEA), and/or Sexual Harassment (SH) Declaration

Date: _____ RFB No.: _____

Alternative No.: _____

Contract Title: _____

To:

We, the undersigned, declare that:

We understand that Bids must be supported by a SEA and/or SH Declaration.

We accept that, if awarded the Contract, we, including our Subcontractors, are required to comply with the SEA/SH Prevention and Response Obligations under the Contract, and we further accept that the Bank may disqualify us from being awarded a Bank-financed contract for a period of two years, if it is determined by Dispute Avoidance/Adjudication Board (DAAB) decision that we:

(a) have failed to correct non-compliance with identified SAE/SH Prevention and Response Obligation; and/or

(b) were non-compliant with such obligations at the time of an alleged incident,

And, in the event of recourse to the Emergency Arbitration provisions under the International Chamber of Commerce Arbitration Rules, an order to reverse the DAAB Decision is not issued by the Emergency Arbitrator under the Rules.

Name of the Bidder*****_____

Name of the person duly authorized to sign the Bid on behalf of the Bidder******_____

Title of the person signing the Bid_____

Signature of the person named above_____

Date signed _____ day of _____, _____

*****: In the case of the Bid submitted by joint venture specify the name of the Joint Venture as Bidder

**: Person signing the Bid shall have the power of attorney given by the Bidder attached to the Bid

[Note: In case of a Joint Venture, the SEA and/or SH Declaration must be in the name of all members to the Joint Venture that submits the Bid.]

Section V - Eligible Countries

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

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

Under ITB 4.8 (a) and 5.1: *None*

Under ITB 4.8 (b) and 5.1: *None*

Section VI - Fraud and Corruption

1. Purpose

1.1 The Bank's Anti-Corruption Guidelines and this annex apply with respect to procurement under Bank Investment Project Financing operations.

2. Requirements

2.1 The Bank requires that Borrowers (including beneficiaries of Bank financing); bidders (applicants/proposers), consultants, contractors and suppliers; any sub-contractors, sub-consultants, service providers or suppliers; any agents (whether declared or not); and any of their personnel, observe the highest standard of ethics during the procurement process, selection and contract execution of Bank-financed contracts, and refrain from Fraud and Corruption.

2.2 To this end, the Bank:

a. Defines, for the purposes of this provision, the terms set forth below as follows:

i. "corrupt practice" is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;

ii. "fraudulent practice" is any act or omission, including misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain financial or other benefit or to avoid an obligation;

iii. "collusive practice" is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;

iv. "coercive practice" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

v. "obstructive practice" is:

(a) deliberately destroying, falsifying, altering, or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive, or collusive practice; and/or threatening, harassing, or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or

(b) acts intended to materially impede the exercise of the Bank's inspection and audit rights provided for under paragraph 2.2 e. below.

b. Rejects a proposal for award if the Bank determines that the firm or individual recommended for award, any of its personnel, or its agents, or its sub-consultants, sub-contractors, service providers, suppliers and/ or their employees, has, directly or indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question;

c. In addition to the legal remedies set out in the relevant Legal Agreement, may take other appropriate actions, including declaring misprocurement, if the Bank determines at any time that representatives of the Borrower or of a recipient of any part of the proceeds of the loan engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices during the procurement

process, selection and/or execution of the contract in question, without the Borrower having taken timely and appropriate action satisfactory to the Bank to address such practices when they occur, including by failing to inform the Bank in a timely manner at the time they knew of the practices;

d. Pursuant to the Banks Anti-Corruption Guidelines and in accordance with the Bank's prevailing sanctions policies and procedures, may sanction a firm or individual, either indefinitely or for a stated period of time, including by publicly declaring such firm or individual ineligible (i) to be awarded or otherwise benefit from a Bank-financed contract, financially or in any other manner;1 (ii) to be a nominated[2] sub-contractor, consultant, manufacturer or supplier, or service provider of an otherwise eligible firm being awarded a Bank-financed contract; and (iii) to receive the proceeds of any loan made by the Bank or otherwise to participate further in the preparation or implementation of any Bank-financed project;

e. Requires that a clause be included in bidding/request for proposals documents and in contracts financed by a Bank loan, requiring (i) bidders (applicants/proposers), consultants, contractors, and suppliers: and their sub-contractors, sub-consultants, service providers, suppliers, agents, personnel, permit the Bank to inspect[3] all accounts, records and other documents relating to the procurement process, selection and/or contract execution, and to have them audited by auditors appointed by the Bank.

---

1 For the avoidance of doubt, a sanctioned party's ineligibility to be awarded a contract shall include, without limitation, (i) applying for pre-qualification, expressing interest in a consultancy, and bidding, either directly or as a nominated sub-contractor, nominated consultant, nominated manufacturer or supplier, or nominated service provider, in respect of such contract, and (ii) entering into an addendum or amendment introducing a material modification to any existing contract.

2 A nominated sub-contractor, nominated consultant, nominated manufacturer or supplier, or nominated service provider (different names are used depending on the particular bidding document) is one which has been: (i) included by the bidder in its pre-qualification application or bid because it brings specific and critical experience and know-how that allow the bidder to meet the qualification requirements for the particular bid; or (ii) appointed by the Borrower.

3 Inspections in this context usually are investigative (i.e., forensic) in nature. They involve fact-finding activities undertaken by the Bank or persons appointed by the Bank to address specific matters related to investigations/audits, such as evaluating the veracity of an allegation of possible Fraud and Corruption, through the appropriate mechanisms. Such activity includes but is not limited to: accessing and examining a firm's or individual's financial records and information, and making copies thereof as relevant; accessing and examining any other documents, data and information (whether in hard copy or electronic format) deemed relevant for the investigation/audit, and making copies thereof as relevant; interviewing staff and other relevant individuals; performing physical inspections and site visits; and obtaining third party verification of information.

BILL of Quantity

Government of Nepal

Ministry of Physical Infrastructure and Transport

Department of Roads

Development Cooperation Implementation Division

Kathmandu, Nepal

Strategic Road Connectivity & Trade Improvement Project

Upgrading of Kamala-Dhalkebar- Bagmati Road Section
(Km 238+030 to km 312+785) of
Mahendra Highway

Contract No.: SRCTIP-DOR-W- KDP-ICB-4 (Comprising Lots 1, 2 and 3)

Phase 1: Upgrading Works

(Upgrading of existing road from 2-Lanes to 4 Lanes and Service Lanes, Structures, Bridges, etc. including Defect Notification Period)

Phase 2: Performance Based Maintenance Works

(Maintenance works consisting of all activities to be carried out to achieve and keep the road assets as defined in the PBM Specifications)

Bidding Document
For
Lot 3(Km 289+840 to Km 312+785)

Part II Employer's Requirements

Section: VII A	**Standard Specifications**
Section: VII B	**Special Provisions to Standard Specifications**
Section: VII C	**Environment and Social (ES) Requirements**
Section: VII D	**Environmental and Social Management Plan (ESMP)**
Section: VII E	**Drawings (In Separate Volume)**
Section: VII F	**Supplementary Information Regarding Works to Be Procured**
Section: VII G	**Personnel Requirements**
Section: VII H	**Equipment Requirements**

March 2024

Standard Procurement Document Summary

Bidding Document: Request for Bids – Works (After Prequalification)

PART 1 – BIDDING PROCEDURES

Section I - Instructions to Bidders (ITB)

This Section provides relevant information to help prequalified Bidders prepare their Bids. It is based on a one-envelope Bidding process. Information is also provided on the submission, opening, and evaluation of Bids and on the award of Contracts. **Section I contains provisions that are to be used without modification.**

Section II - Bid Data Sheet (BDS)

This Section includes provisions that are specific to each procurement and that supplement Section I, Instructions to Bidders.

Section III - Evaluation and Qualification Criteria

This Section specifies the criteria to determine the Most Advantageous Bid.

Section IV - Bidding Forms

This Section includes the forms for the Bid Submission, Bill of Quantities, Schedules of technical proposal, including technical and financial qualifications, personnel, financial resources, and equipment, Bid Security and others to be completed and submitted by the Bidder as part of its Bid.

Section V - Eligible Countries

This Section contains information regarding eligible countries.

Section VI - Fraud and Corruption

This Section includes the Fraud and Corruption provisions which apply to this Bidding process.

PART 2 – WORKS' REQUIREMENTS

Section VII -Works' Requirements

This Section specifies the Scope of Works, Specification, the Drawings, and supplementary information that constitute the Works' Requirements for the Works to be procured. The Works' Requirements also include the environmental and social (E&S) requirements (including requirements relating to Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) which are to be satisfied by the Contractor in executing the works.

Section: VII A Standard Specifications
Section: VII B Special Provisions to Standard Specifications
Section: VII C Environment and Social (ES) Requirements

Section: VII D **Environmental and Social Management Plan (ESMP)**
Section: VII E **Drawings (In Separate Volume)**
Section: VII F **Supplementary Information Regarding Works to Be Procured**
Section: VII G **Personnel Requirements**
Section: VII H **Equipment Requirements**

PART 3 – CONDITIONS OF CONTRACT AND CONTRACT FORMS

Section VIII - General Conditions (GC)

This Section refers to the "General Conditions" which form part of the Conditions of Contract for Construction (Second Edition 2017) published by the Federation Internationale Des Ingenieurs – Conseils (FIDIC).

Section IX - Particular Conditions (PC)

This Section includes particular conditions of the contract consisting of: Part A- Contract Data; Part B -Special Provisions, PART C – Fraud and Corruption; and PART D – Environmental and Social (E&S) Compliance Reporting Metrics for Progress Reports. The contents of this Section supplement the General Conditions and shall be completed by the Employer.

Section X - Contract Forms

This Section contains the Letter of Acceptance, Contract Agreement and other relevant forms.

Part II - Employers Requirements

This Section contains the Summary of Description of Works, Specifications and Drawings that describe the Works to be procured.

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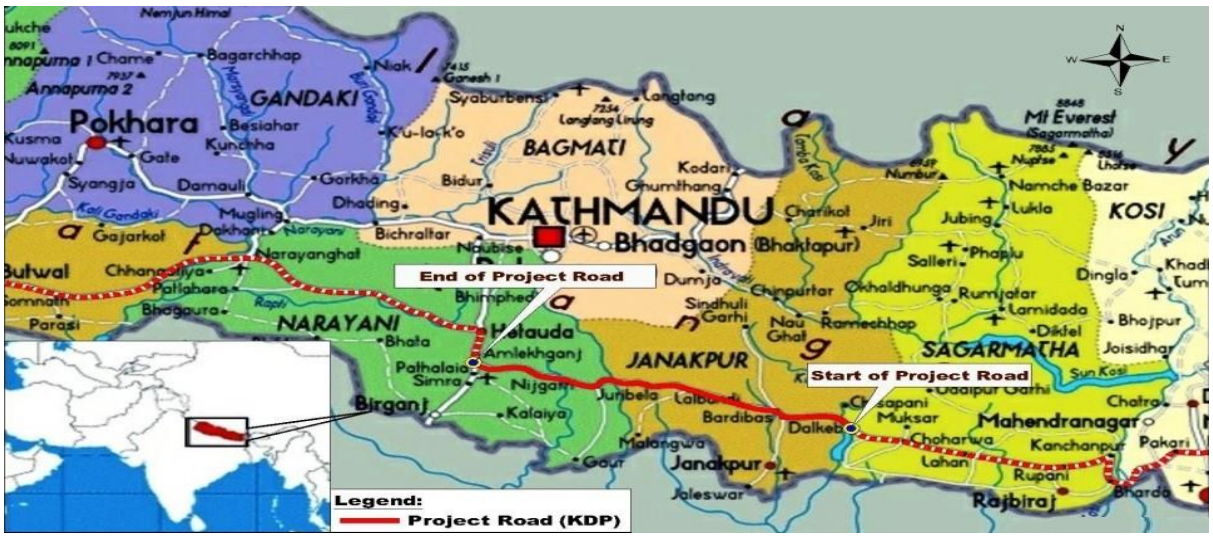
Scope of Works

East-West Highway, Kamala-Bagmati Road Section is a National Highway (H-01) under strategic road networks of Nepal and lies **in Dhanusha, Mahottari and Saralahi districts of Madhesh Province of the Country.**

Location Map

The road starts after the Kamala bridge approach from Phuljor Bridge in Sarlahi District to Bagmati East Canal in Sarlahi District from Km 289+840to Km 312+785



The Works under this Contract Package-5 from Km 289+840 to Km 312+785

consist of:

Phase 1: Upgrading Works; with Upgrading of existing road from 2-Lanes to 4 Lanes and Service Lanes, Structures and Construction of Bridges, etc. including Defect Notification Period; and

Phase 2: Performance Based Maintenance Works; with Maintenance works consisting of all activities to be carried out to achieve and keep the road assets as defined in the Km 289+840 to Km 312+785 PBM Specifications on upgraded 4-Lane from Km Road Section of East-West Highway.

The Summary Description of the main works, however, is as follows:

i) Traffic management provisions during construction including the construction of

diversions roads and bridges;

ii) Roadway excavation and formation of embankment for widening of road section and for geometric improvement of road;

iii) Construction of side drains, retaining structures;

iv) Construction of cross-drainage structures;

v) Construction of sub-base, base and bituminous pavement;

vi) Supply, erection and installation of road safety measures,

vii) Construction of bridges and their elements;

viii) Construction of overpasses, underpasses and fly overs;

ix) Dismantling of existing RCC bridges;

x) Performance based maintenance works to achieve and keep the road assets as defined in the PBM Specifications, etc.

Section VII A: Standard Specifications

Standard Specifications for this contract shall be the **"Standard Specifications for Road and Bridge Works-2073 (with second amendment 2078/2022)"** issued under the authority of the Government of Nepal, Ministry of Physical infrastructure and Transport, Department of Roads.

The Standard Specifications may be purchased from the Departments of Roads, Central Road Laboratory, Chakupat, Lalitpur.

The document can be obtained by downloading from:*www.dor.gov.np*

Section VII B: Special Provisions to the Standard Specifications

The Special Provisions contained herein shall be read in conjunction with Section VII A: **the Standard Specifications for Road and Bridge Works-2073 (with second amendment 2078/2022)** issued by the Government of Nepal, Ministry of Physical Infrastructure and Transport, Department of Roads and shall supplement, replace or supersede the Section 6A: Standard Specifications as appropriate. Where there is any ambiguity or discrepancy between the Standard Specifications and the Special Provisions; the Special Provisions shall have preference and shall govern.

Section 100 – General

Add clause 103a after the clause 103 with the heading "Site Laboratory" as following"

103a Site Laboratory

Provision of Site Laboratory

3.1 General Requirements

The Contractor shall provide, operate and maintain an adequately equipped site Laboratory complete with all utilities, services apparatus and fittings as set out in **Appendix –6** and **Appendix – 7** to undertake the required testing to ensure the quality of the materials and the works. The Contractor shall also supply and provide, at the laboratory the standards listed and set out in **Appendix - 1.** The laboratory space including lab office and lab arrangement shall be with plinth area of approximately 120 sq m with two (2) rooms plus one additional large hall, outside covered veranda and toilet bathroom.

The Site Laboratory shall be located within 500 m of the site and the lab building may be located at the rented building or newly constructed on rented land. The laboratory shall be available up to the end of the project.

The complete laboratory facilities shall include the provision of land, site grading, access roads, covered parking facilities for vehicles, construction of building and all necessary appurtenance such as electricity, drainage systems, fences and utilities etc.

The contractor shall supply furniture, fittings, equipment, vehicle, manpower and materials to provide fully functional site laboratory.

The site laboratory shall be ready to use within 10 weeks from the date of the Engineer's notice to commence the Works. Alternative arrangement for testing shall be made by the date of commencement of works.

The Contractor shall be fully responsible for the equipment including: -

- Maintaining, calibrating and servicing equipment as required.
- Repairing all defects including accidental damage as required.
- Replacing any lost or stolen items.
- Effecting insurance of the equipment against damage or loss.
- The tests which cannot be performed at site shall be carried out off the site at renowned laboratory acceptable to the Engineer.

The site lab shall be made available for testing as long as it is required including any period after the Completion of construction during which it is required for final measurement purposes.

At the completion of the project, the furniture and equipment shall be the property of the Contractor.

3.2 Measurement

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Providing laboratory space, furniture, laboratory equipment, maintaining and operating the material testing laboratory at site, etc., all complete, shall be measured on monthly basis as provided in the Bill of Quantities. It includes establishing the site laboratory which includes construction/renting of lab building, required consumables, maintenance and operation of the site laboratory and supply of laboratory personnel and staff at laboratory for day to day works and testing etc.

3.3 Payment

Payment for providing laboratory space, furniture, laboratory equipment, maintaining and operating the material testing laboratory at site, etc. all complete shall be made against the respective item of the Bill of Quantities.

Payment shall represent full and final payment for the Contract Items and the Contractor shall not be entitled to any further compensation. The Contractor shall provide such facilities during the extended time period as long as the Employer may require.

In the event the Contractor fails to maintain, repair or replace any equipment item, the Employer shall carryout such maintenance, repairs or replacement and the Employer shall deduct the cost from any monies due to the Contractor.

104 Accommodation of Traffic

Delete Clause 104 in its entirety and substitute with the following:

Change heading of Clause 104 Accommodation of Traffic to Clause 104 Traffic Management Provisions as follows:

104 Traffic Management Provisions

(1) Scope

This Clause covers the requirements to be met by the Contractor in relation to traffic management provisions at construction sites which include management of regular traffic on existing road or proposed temporary works (diversions), management of construction traffic and traffic control and guidance schemes in order to ensure safe and reasonably efficient operation of vehicular and pedestrian traffic along the subject road corridors.

The passage over or through the Works shall be used by the public or the representative of the Employer or by public traffic or by vehicles of the Employer, whether connected with the Contract or not and that shall not constitute use or occupation by the Employer. So the Contractor shall make proper traffic management provisions at construction sites to open the traffic during construction and provide the alternate route for traffic in case of closure of a particular section.

(2) Preparation of Traffic Management Plan

The Contractor shall prepare Traffic Management Plan (TMP) based on the guidelines provided by the Engineer and submit it to the Engineer for approval prior to the commencement of construction. The Plan shall show the means and methods of operation and control of existing as well as its construction traffic during the construction works. The means and methods of managing traffic shall be suitable and adequate for ensuring safety of all road users as well as

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Contractor's own workers and to the satisfaction of the Engineer. The Traffic Management Plan shall include but not be limited to the following.

i. Traffic control equipment the Contractor proposes to use for the Works;

ii. Traffic control signage including location and sign descriptions;

iii. How and when the Contractor proposes to use traffic control flagmen;

iv. Traffic control means during non-working periods;

v. Traffic control means and devices for night and off-peak periods;

vi. Lane closure plan, where the Contractor intends to close the road partially;

vii. Traffic diversion plan, where the Contractor proposes to close the road fully.

The general traffic management requirements will be as given below.

(3) General Traffic Management Requirements

The following conditions shall apply in regard to traffic management:

(i) The Contractor shall keep existing roads open to traffic during the performance of the Works, provided that when approved by the Engineer the Contractor may bypass traffic over a detour. The Contractor shall at all times keep roads and footpaths, affected by his operations, free from soil and material spillage;

(ii) The Contractor shall keep the length of the construction areas in such condition that traffic will be accommodated safely. Traffic control devices and services shall be provided and maintained both inside and outside the Project limits as needed to facilitate traffic guidance should this be necessary;

(iii) In order to facilitate the better traffic management as well as convenience to road users, the construction works shall be divided into the stretches of less than 5 Km each and the contractor shall prepare the work schedule for constriction works on each stretch such that no major construction works shall be carried out in adjoining stretches and submit it for engineer's approval. Construction works shall not be carried out in adjoining stretches without prior written instruction of the engineer.

(iv) Prior to the start of construction operations, the Contractor shall erect such signs, barricades, and other traffic control devices as may be required by the plans, specifications or as directed by the Engineer. Traffic control devices shall be operated only when they are needed and only those devices that apply to conditions actually in existence shall be operable. The Contractor shall obtain prior approval from the competent authority (Traffic Police) of the plans and specification of the proposed traffic management works before the commencement of work;

(v) Temporary fences shall be placed to provide a visual barrier between the work area and adjacent traffic or buildings and at locations directed by the Engineer;

(vi) Any devices provided under this Clause that are lost, stolen, destroyed, or deemed unacceptable while their use is required on the Project shall be replaced by the Contractor without additional compensation;

(vii) During non-working hours and following completion of a particular construction

operation, all warning signs, except those necessary for the safety of the public, shall be removed or entirely covered with either metal or plywood sheeting so that the sign panel will not be visible;

(viii) The contractor shall keep retro-reflective sheeting on signs, barricades, and other devices. The Contractor shall also promptly correct stretches, rips, and tears in the sheeting. Retro- reflective sheeting shall have a maintain erector-reflection;

(ix) Night time operations, if any approved by the Engineer, shall be illuminated by a lighting system approved by the Engineer. The lighting system shall be positioned and operated to preclude glare. Incandescent lights will not be permitted;

(x) The Contractor shall take necessary care at all times during the execution of the works to ensure the existing convenience and safety of residents along and adjacent to the road, and any public highway or other facility that may be affected by the Works. Street lighting shall be relocated as necessary to maintain the same standard of lighting during the course of the works until new lighting facilities are brought into operation;

(xi) The Contractor shall thoroughly acquaint himself with existing traffic conditions and understand the importance of maintaining traffic safety and the avoidance of excessive traffic delay. The Contractor shall co-operate with the pertinent agencies regarding traffic control and all details will be subject to the Engineer's approval;

(xii) The Contractor shall be responsible for investigating and establishing the requirements for traffic control and safety in all work areas and shall submit all details to the Engineer;

(xiii) The Contractor's requirements shall include, but not be limited to, construction of detours, diversion roads, temporary bridges and approach roads, of traffic control devices and services for the control and protection of traffic through areas of construction;

(xiv) Any failure of the Contractor to meet these requirements will entitle the Employer to carry out such works as he deems to be necessary and to charge the Contractor with the full cost there of plus ten percent of such cost, which sum will be deducted from any money due or which may become due to the Contractor under the Contract.

(xv) Road Damage: Contractor will be responsible for all road damage that may occur from the transporting of his materials and equipment to and from the Works and will be responsible for coordinating with all concerned agencies for implementing all necessary repairs and/or restorations. The Contractor shall be required to repair to the satisfaction of the Engineer and at no cost to the Employer any damage that he causes to the road;

(xvi) When construction under traffic is permitted, the Contractor shall arrange its construction program so that traffic flow is maintained through the Works in accordance with the requirements as laid out by Traffic Police or as approved by the Engineer;

(xvii) Vehicular access points to and from the site shall be in accordance with the requirements of the best practice design standards, guides and manuals approved by the Engineer. Acceleration and deceleration lanes and tapers shall comply with the traffic volume, speed and sight distance warrants specified in the standards and guides or as approved by the Engineer. Cross section widths for acceleration and deceleration lanes shall be a minimumof3.5 m. The contractor shall provide traffic controllers at all entry and exit

points.

(4) Temporary Road Works Requirements for Traffic Management

The following conditions shall apply in regard to temporary works:

(i) The Contractor shall furnish, maintain, and remove on completion of the work for which they are required, all temporary roads and road works such as sleeper tracks and staging over roads, access and service roads, temporary crossings of bridges over streams or unstable ground, and shall make them suitable in every respect for carrying materials for the work, for providing access for traffic for himself or others, or for any other purpose. Such temporary road works shall be constructed to the satisfaction of the Engineer, but the Contractor shall nevertheless be responsible for any damage done to or caused by such temporary road works;

(ii) Before constructing temporary road works, the Contractor shall make all necessary arrangements, including payment if required, with the public authorities or landowners concerned, for the use of the land and shall obtain the approval of the Engineer. Such approvalwillbedependentontheEngineerbeingsatisfiedwiththeContractor'sproposalsfor items such as signing, lighting and riding quality of the temporary road together with the proposed maintenance arrangements. Such approval will not, however, relieve the Contractor of his responsibilities under the Contract. Upon completion of the works the Contractor shall clean up and restore the land to the satisfaction of the Engineer;

(iii) The Contractor, when required by the Engineer, shall submit for the Engineer's approval drawings giving full details of temporary roads. Such details shall include alignment, profile, pavement construction, signing, lighting and the duration of the temporary road;

(iv) The Contractor shall make all arrangements necessary to permit the passage of materials and employees;

(v) In cases where it is necessary or required by the Engineer, the Contractor shall construct and maintain temporary traffic ramps, and furnish all labour and materials required.

(5) Scope of Traffic Management Plan

The Traffic Management Plan submitted by the contractor shall:

(i) Provide details of the consultative process proposed to ensure consultation with and notification to the community, business, road users and other stakeholders in advance of alterations to existing traffic conditions. The Contractor's proposed inputs into the communication process shall ensure the timely notification of the Traffic Police, relevant departments, travelling public, emergency services, adjacent landowners and businesses of impending changes to traffic conditions. This process shall take cognizance of any Department's requirements with respect to public notifications;

(ii) Describe traffic arrangements which provide for any necessary sequencing of the work under the Contract while minimizing disruption and confusion to road users, local traffic, emergency vehicles, pedestrians and cyclists;

(iii) Where required, describe how the construction work area shall be physically and visually isolated from road users;

(iv) Provide details of how local access to communities and adjacent private properties and businesses will be maintained;

(v) Provide details of arrangements to be made for detouring traffic;

(vi) Provide details of all road closures and/or restrictions required to undertake the work under the Contract;

(vii) Detail provisions to maintain the specified number of traffic lanes in each direction at the minimum nominated operating speed between the hours stated elsewhere in the contract or as approved by the Engineer;

(viii) Provide for participation of a senior member of the Contractor's site personnel on any traffic coordination committee convened by the Department or its designated representative;

(ix) Include the names and contact details of the representatives nominated by the Contractor andnotifiedtotheEngineer.TheContractorshallnominateaminimumoftworepresentatives with the authority to address traffic management issues one of whom shall be available at all times outside of the Contractor's normal working hours. The Contractor shall notify the Engineer and Department or its designated representative of the name, address and telephone number of the nominated persons. Such persons, when requested by the Engineer shall coordinate and expedite immediate repairs to and maintenance of such part of the work under the Contract as may be considered necessary by the Engineer and shall carry out such work to the satisfaction of the Engineer;

(x) If a nominated person leaves the employment of the Contractor during the period of the Contract, the Contractor shall immediately nominate another person and provide the full details of that person;

(xi) Include the name of the Nominated Traffic Officer;

(xii) Include a schedule of Traffic Guidance Schemes giving a general description of the relevant traffic arrangements and the date when the Traffic Guidance Scheme will be submitted;

(xiii) Provide details of the Contractor's organizational structure for traffic management issues including a list of the duties and responsibilities of each position nominated in that structure;

(6) Traffic Control

The following conditions shall apply in regard to traffic control:

(i) In order to facilitate traffic through or around the Works, or wherever ordered by the Engineer, the Contractor shall erect and maintain at prescribed points on the work and at the approaches to the work, traffic signs, lights, flares, barricades, rubber cones with traffic lamps and other facilities as necessary or required by the Engineer for the proper direction and control of traffic;

(ii) As necessary for proper control of traffic or when/where directed by the Engineer, the Contractor shall furnish and station competent flagmen whose sole duties shall consist of

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directing the movement of traffic through or around the work;

(iii) The Contractor shall furnish and erect, within or in the vicinity of the project area, such warning and guide signs as may be necessary or ordered by the Engineer;

(iv) In order to minimize disruption to traffic flows the Contractor shall enclose the Site with temporary fence to provide a visual barrier between his work and adjacent traffic. The temporary fence shall be two meters high and the movement of men, materials and plant into and out of the barrier area shall be controlled by flagmen (traffic controller);

(v) The Contractor shall erect multimedia display device at the start and end point of the road section which should provide the information about the traffic control and traffic management plan for the roads users. Likewise, the Contractor should broadcast this information from the local FM Radio as may be necessary or requested by the Engineer.

(7) Number of Lanes for Traffic Control

In so far as possible, the existing number of traffic lanes shall be maintained insofar as possible during the work and if diversions are provided these must be of the same traffic capacity as the original road. Notwithstanding the above, the Engineer may give approval to reductions in traffic capacity if the Contractor can show that these will not cause excessive delay to traffic. If such approval is given, the Engineer may specify the hours during the day when the reduction in capacity may be applied and it should be anticipated that these hours may not include the peak period for the traffic movement under consideration.

The Contractor shall cooperate with the pertinent agencies regarding traffic control and all details will be subject to the Engineer's approval.

(8) Half-Width Construction

The following conditions shall apply to half-width construction:

(i) Where, in the opinion of the Engineer, a detour is not feasible, construction on existing public roads shall be undertaken only over half of the full width of the roadway. The length of such half-width construction shall be kept as short as possible;

(ii) Where half-width construction is necessary, work on culverts commenced in the dry season must be completed and the embankments adjacent to them must be reinstated so that at least half the full width shall be available for use by the public throughout the next rainy season.

(iii) Where single-lane traffic becomes necessary over a particular length of the works or over the approaches thereto, the Contractor, in maintaining through traffic, shall provide a single lane at least three and a half meters wide on the roadway or embankment to be kept open to traffic.

The Contractor shall so conduct his operations as to offer the least possible obstruction, inconvenience, and delay to traffic and shall be responsible for the adequate control of the traffic using such lengths of single lane.

(9) Extraordinary Traffic

The Contractor shall be responsible for carrying out any necessary investigations and the

obtaining of approvals, licenses, escorts and any other necessary facilities in order to enable his extraordinary traffic to be moved on the roads in the Project Area.

(10) Vertical Clearance

In general, any temporary works placed over roads or diversions used by public traffic should maintain a vertical clearance of at least 4.5 meters. Where required by the Engineer the Contractor shall erect and maintain suitable approved check-gates, fitted with warning signs indicating the vertical clearance.

(11) Materials for Traffic Control Devices

Materials for traffic control devices shall conform to the requirements set forth below:

(i) Unless otherwise specified in the contract, sign panels, barricades, cones, vertical panels, and flagger paddles shall have retro-reflective sheeting meeting requirements for retro-reflective material as specified by the Engineer;

(ii) Sign Panels shall be orange with black legend unless otherwise required;

(iii) Sign Posts shall be fabricated from untreated softwood, metal, or other materials acceptable to the Engineer. Signs shall be capable of remaining in position during normal traffic flow and wind conditions;

(iv) Barricades shall be constructed of wood, metal or plastic;

(v) Cones shall be a minimum of 75 centimeters in height with a broadened base and shall be capable of withstanding impact without damage to the cones or vehicles. All cones shall be orange/white colored and highly visible both in daylight and darkness. Cones shall be capable of remaining bright and in position during normal traffic flow and adverse weather conditions in the area where they are used. Lamps for cones shall be suitable for purpose;

(vi) Temporary fencing shall be fabricated in panels with timber framework and galvanized metal panels. The panel face towards the traffic shall be painted;

(vii) Vertical panels shall be constructed of wood, metal or plastic;

(viii) Warning lights shall be Type A (low intensity flashing), Type B (high intensity flashing), or Type C (steady burn) as approved by the Engineer.

(12) Preparation of Traffic Guidance Scheme

The Traffic Guidance Scheme shall be prepared by suitably qualified and experienced persons and shall be submitted by the Nominated Traffic Officer to the Engineer for a direction as to its suitability, at least 14 days prior to the date of the proposed traffic rearrangement.

Where any change to existing traffic arrangements is proposed or where construction conflicts with normal traffic movements, the Contractor shall prepare a Traffic Guidance Scheme which clearly details the revised traffic arrangements at all locations affected by the change or conflict. Planning of Traffic Guidance Schemes shall be undertaken in accordance with best practice road works traffic management manual or guide as approved by the Engineer.

The Traffic Guidance Scheme shall show proposed temporary signing and other traffic control

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device layouts (including temporary barriers, temporary pavement marking and temporary islands) to a suitable scale and be fully dimensioned and shall generally agree with the construction sequence and other requirements shown elsewhere in the Contract. The Traffic Guidance Scheme shall also state the period for which these are to be in place (time and date) and the person who is responsible for installing, maintaining and removing them. Site access arrangements shall form part of the Traffic Guidance Scheme.

Where the Traffic Guidance Scheme includes changes to regulatory signs or devices, the Contractor shall seek prior approval from the Engineer of such regulatory signs certified by the Nominated Traffic Officer with the Traffic Guidance Scheme.

The Contractor and the Engineer shall cooperate to ensure that the Traffic Guidance Scheme receives the Department's direction with respect to suitability at least 14days prior to the proposed traffic rearrangement. Failure to comply with this requirement may result in deferring the date for traffic rearrangement so as to ensure sufficient time for public notification is maintained. Such deferment shall not be a cause for an extension of time under the Contract.

No traffic rearrangements shall be carried out until 14 days after the Engineer has advised the Contractor that the relevant Traffic Guidance Scheme has been deemed suitable by the Engineer. Engineer may direct the Contractor to consult with Area Traffic Police Officer and seek approval of the traffic guidance scheme from the officer.

(13) Implementation of Traffic Management Plan

The Contractor shall implement the Traffic Management Plan in accordance with the schedule included in the Plan. The Contractor shall provide details of the Traffic Management Plan or any changes to that Plan to any bodies nominated by the Engineer. The Contractor shall monitor the continued effectiveness of the Traffic Management Plan during the Contract and shall revise and update the Plan where necessary.

(14) Implementation of Traffic Guidance Scheme

The Contractor shall implement only those traffic management arrangements that have been deemed suitable by the Engineer. Should the Contractor wish to depart from such arrangements, an amended Traffic Guidance Scheme shall be submitted to the Engineer for determination of suitability prior to implementation of any new arrangements.

Prior to any change to existing traffic arrangements, the Contractor shall ensure that the traffic management arrangements conform to the Traffic Guidance Scheme.

In a daily basis, the Contractor shall ensure that all applicable traffic redirection and/or warning measures and safety requirements are implemented prior to proceeding with any relevant work under the Contract.

The Contractor shall monitor the effectiveness of the Traffic Guidance Scheme and revise it in response to incidents and/or traffic disruptions. Details of a Traffic Guidance Scheme shall be provided on request to any other body nominated by the Engineer.

(15) Measurement and Payment

Compliance with Traffic Management Provisions (preparation and implementation of traffic management plan, traffic guidance schemes and traffic control scheme, traffic Marshals etc),

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including construction and maintenance of temporary road diversion works either in full new land length or using existing roads, irrespective of the length and extent of traffic control measures in such diversions; construction and maintenance of temporary bridge diversions; construction of access roads to bridge construction site; etc. shall not be measured and/or no payment shall be made for all materials and works required under this clause. All cost in connection with the work specified herein shall be considered to be included with other related items of the work in the Bill of Quantities.

105 Publicly and Privately Owned Services

Delete Sub-clause (6 and 7) and substitute the following:

(6) The Contractor may be required to coordinate with the concerned GoN and other authority and carry out the removal or shifting of certain services/utilities on specific instruction from the Engineer for this purpose the contractor shall when required by the Engineer, submit the required document for executing of the works as per the General Condition of Contract for which payment shall be made to him. Such works shall be taken up by the Contractor only after obtaining clearance by the Engineer and ensuring adequate safety measures.

(7) Payment for Shifting, re-installation, maintenance of water, electricity, drainage, etc., passing through the site made in the respective item as provisioned in the Bill of Quantities and General Condition of Contract. Payment shall represent full and final payment for the Contract Items and the Contractor shall not be entitled to any further compensation.

106 Survey and Setting Out

Delete Sub-clause (1 and 2) and substitute the following:

(1) During the period of Commencement of Works the Contractor and the representative of the Engineer shall jointly resurvey the Base Lines, Traverse Point, and Bench Marks and confirm the co-ordinates and levels of the stations. They shall immediately notify the Engineer of any discrepancies and shall agree with the Engineer any amended values to be used during the contract, including replacements for any stations missing from the original stations.

(2) The Contractor and the representative of the Engineer shall jointly check, replace and supplement as necessary the station points and agree any revised or additional station details with the Engineer.

Add the following to Sub-clause (5)

"If at any time the Contractor believes that there exists a discrepancy between the location of the works as defined by the setting out and the apparent location of the works as shown in the plans he shall immediately inform the Engineer and request clarification."

Delete Sub-clause (6) and substitute the following:

"Some survey data of the project site is held by the Engineer and this survey data will be made available to the Contractor in digital format. But the existing profile and cross sections shall be checked against the survey data by the Contractor and the Engineer and, should any changes be found necessary in the Survey Traverse Points and Bench Marks, after the procedures required in Sub-clauses (1) & (2) above, the existing data set shall be amended accordingly. Should the

Engineer consider that design modifications of the center-line and/or gradient are required or if the Contractor find that the existing survey data set is inadequate or inaccurate in any area of the Works, the Engineer shall issue detailed Instructions to the Contractor and the Contractor shall perform the necessary modifications in the field, as required, and modify the cross sections accordingly.

The final survey data set so obtained in combination with the final horizontal and vertical alignment of the road shall form the basis for the measurements and payments. Measurement shall be based on a Digital Terrain Model generated from the agreed survey data set with the final designed road horizontal and vertical alignment and road cross-section, including any widening and super-elevation, applied. The model will be used to generate cross-sections complete with cut and fill data at intervals not exceeding 10 meters or as instructed by the Engineer. Measurement of volumes and areas of earthworks and pavement related items, with the Engineer's approval, shall be derived from these cross-sections.

The software currently used for the preparation of survey and design data is Bentley. Should the Contractor wish to use alternative software he may propose this to the Engineer. He will be required to demonstrate that his proposed alternative is at least as accurate as and is functionally equivalent in all respects to Bentley . Should the Engineer agree to the use of alternative software, the Contractor shall be timely responsible for the adaptation, under the supervision of the Engineer, of all input data to the alternative software requirements and for the training of the Engineer's personnel in the use of the alternative software. In the event that alternative software is approved the Contractor shall supply the Engineer with two, fully licensed, copies of the alternative for the exclusive use of the Engineer."

If required a complete set of Software shall be provided by the Contractor at his own cost for the use of the Engineer in carrying out the checking and approval of the cross sections and quantities.

Delete Sub-clause (8) and substitute the following:

The Contractor shall provide the Engineer with all necessary assistance for checking the setting out, agreement of levels and any other survey or measurement which the Engineer needs to carry out in connection with the contract during the entire period of contract. Such assistance shall include:

(a) Provision of suitably qualified surveyors to work under the direction of the Engineer as required.

(b) Provision of all necessary support for these surveyors including assistant, survey helpers, labours, hand tools, pegs and materials.

(c) Provision of survey equipment (As per Appendix 5: Survey Instrument Required at Site) as required by the Engineer for survey works.

This equipment shall be in the possession of the Contractor at Site within 10 weeks from the date of Engineer's notice to commence the Works. The Contractor shall at all-times be responsible for:

- Maintaining, calibrating and servicing equipment as required.
- Repairing all defects including accidental damage as required.
- Replacing any lost or stolen items.

- Effecting insurance of the equipment against damage or loss.

The Contractor shall maintain the survey equipment at site for as long as it is required including any period after the Completion of Works during which it is required for final measurement purposes.

The Contractor shall ensure that the Engineer and his staff have full access to this equipment at all times during the course of the execution of works.

The joint survey, including the preparation of the drawings, calculation of the quantities and obtaining the approval from the Engineer shall be carried out by the Contractor within sixty (60) days from the commencement Date.

The Contractor shall provide the survey equipment as per **Appendix-5.** No separate payment shall be made for the providing survey equipment; the cost shall deem to be included in the other items of works.

108 Diversion Bridges

Delete Clause 108 in its entirety and substitute with the following:

Change heading of Clause 108 Diversion Bridges to Clause 108 Construction and Maintenance of Temporary Diversion Bridges as follows:

108 Construction and Maintenance of Temporary Diversion Bridges

(1) Temporary diversion bridges shall be provided by the Contractor at the location of the construction of minor bridges, where the existing bridges are dismantled and new bridges are required to be constructed as shown on the Drawings or instructed by the Engineer.

(2) The Contractor is required to prepare Design, Drawing and Specifications of the temporary diversion bridges. He shall submit his proposal accompanied with sufficient ground and hydraulic information to enable the Engineer to decide on the stability of the structures.

(3) The temporary diversion bridge shall be double lane crossing with the all provisions of safety arrangements facilitating free flow of two-way traffic during day and night throughout the period till the new constructed bridge is opened for the use. **The diversion bridge may consist of series of pipe culvert, Belly Bridge, slab culvert etc. as per the site conditions and acceptable to the Engineer.**

(4) The Contractor shall maintain the temporary bridges in a condition satisfactory to the Engineer so long as required until the completion of the construction of bridges at the river location.

(5) On completion of the construction of bridges, the Contractor shall obtain the approval of the Engineer before removing the temporary bridges. The materials arising from the removal of the temporary diversion bridges shall become the property of the Contractor

(6) No separate payment shall be made for the construction and maintenance of diversion bridges for the required period. The cost shall deem to be included in the item of compliance with traffic management provisions.

109 Maintenance of the Road

Delete the fourth paragraph of Sub-clause Clause 109 (1) and substitute:

(1) The Contractor shall perform the maintenance works as often as required to keep the carriageway, shoulders, adjoining structures and roadside slopes stable all in proper working order to the satisfaction of the Engineer. The Contractor shall strictly adhere to the stipulations of the latest publication of the document **"Road Maintenance Manual"** published by the Department of Roads.

The Contractor shall perform the Routine and Recurrent Maintenance of existing Road including existing bridge over rivers where a separate new bridge contracts are there, as per DoR norms including any type of maintenance works to keep the road pavement "Pot Holes Free (as of original pavement surface)" during the entire construction period.

Existing road shall be maintained throughout the construction/ improvement period under Phase 1. The construction/ improvement works shall be so sequenced to allow traffic movement without hinderance. Existing road shall be maintained as bitumen sealed surface. Before commencing road works on the existing road, the extension or widening parts shall be completed (up to Bituminous macadam) on one side of the existing road providing sufficient width for passage of two-way traffic (minimum 6 m) from the paved shoulder edge towards center line. Construction of median and road works on the remaining portion to the median shall commence only after passage of traffic on the completed section as described above.

In the Road stretches where works supervisors and length workers are being engaged by the Department of Roads for the routine maintenance of the Road, the Contractor shall have to engage them under the same terms and conditions regarding the wages and other facilities.

(2) Measurement and Payment

Delete the wording of Sub-clause (2) in its entirety and substitute:

Maintenance of the existing road during the construction period (Routine and Recurrent/Responsive) shall be paid at the contract unit rate per km-month commencing on the date for the commencement of the works and terminating at the end of Contract Improvement/construction period including any extension of time granted pursuant to the relevant Clause of the Conditions of Contract.

In the event the Contractor fails to perform such maintenance, the Employer shall effect such maintenance works and cost incurred shall be deducted from any payment due under this Contract Item or from any other monies due to the Contractor.

110 Site Information

Delete the first sentence and replace with the following:

The Contractor shall erect where directed by the Engineer signboards in accordance with **Appendix - 5:** Project Signboard which shall be protected and maintained up to the end of Defect

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Notification Period.

Add the following:

Project signboards shall be measured as the number of signboards, satisfactorily provided, installed, maintained throughout the Contract period and subsequently removed.

Payment shall be made at the stated unit rate per signboard. The price shall be full compensation for all materials and labour required to perform the work described.

111 Environmental Protection Works

Delete the second paragraph and substitute:

The Contractor shall take all precautions for safeguarding the environment during the course of construction of the works. He shall abide by all prevailing laws, rules and regulations governing pollution and environmental protection. In particular, the Contractor shall fully comply with the environmental protection mitigation measures specified in the latest version of the project's specific Initial Environmental Examination (IEE), Environmental and Social Impact Assessment (ESIA) or Environmental Management Action Plan (EMAP), as provided by the Engineer. If any activity of the Contractor may cause damage to the environment in ways not envisaged under project-specific documents, then he shall comply with the measures specified in the latest publication of **"Environmental Management Guidelines", and "Environmental and Social Management Frame Work"** published by the Department of Roads and/or any documents published by the World Bank regarding Environmental and Social Issue.

(1) Borrow/Quarry Sites

In the first set of bullet points, delete the words "they may be environmentally unsuitable" in point (iii) and substitute:

"they may lead to general environmental or instability problems or may be environmentally unsuitable in any other way"

At the end of Sub-clause (1) add the following:

"Ten percent (10%) of all payments due to the Contractor in respect of the construction of embankment using borrow material or which are due under any other item of the Bills of Quantities in respect of material won from borrow pits, gravel pits or quarries shall be withheld until the sites of the borrow pits, gravel pits or quarries to which such payments relate have been completely reinstated to the full satisfaction of the Engineer and in accordance with the Specification provisions."

(2) Disposal of Spoil and Construction Waste

Insert additional paragraph to Sub-clause 111 (2) Disposal of Spoil and Construction Waste, between existing first and second paragraphs

Under no circumstances whatsoever shall the Contractor allow spoil from any excavation or cut to fall or be pushed down the slope below. In any situation where this occurs by accident or on purpose, the Contractor shall, at his own cost, remove the debris to a location approved by the Engineer and make good the affected area through appropriate structures and re-vegetation as specified by the Engineer and following guidelines published in the Department of Roads' manual

"Roadside Bio- Engineering". Failure in compliance with the Engineer's instruction in respect of spoil disposal will lead to a reduction or with-holding of payment.

Add an additional paragraph after the existing second paragraph

Any construction waste that includes bitumen products, unused cement, fuel, oil or plastics shall be disposed of in a Government-approved or municipal landfill site. If this is not practical, then it may be disposed of by burial in a specially excavated pit at a site approved by the Engineer. Land compensation shall be paid by the Contractor for the area occupied by the pit as if for permanent construction. If the land is owned by the Government, then the Contractor must obtain written permission from the appropriate authority for its use in this manner, and must pay any royalties due. The pit shall be located at least 100 metres from any seasonal or permanent water course or spring. A hole shall be excavated below ground level so that, when the original surface profile is regained through backfilling, the disposed waste is covered by at least two metres of soil. Following the closure of the waste disposal site, the Contractor shall provide any structures necessary to prevent erosion and shall re-vegetate the topsoil with appropriate plants.

(3) Provision and Maintenance of Camps, Offices, Stores, Equipment Yards and Workshops

Replace the first paragraph of the Sub-clause 111(3) with the following:

The Contractor shall provide and maintain such accommodation and amenities as necessary for all his staff and labour, employed for the purposes of or in connection with the Contract, including all fencing, water supply(both for drinking and other purposes), electricity supply, sanitation, cookhouses andotherrequirementsinconnectionwithsuchaccommodationoramenities.OncompletionoftheContract, unless otherwise agreed with the Employer, all the temporary camps/housing provided by the Contractor shall be removed and the site(s) reinstated to its (their) original condition, all to the approval of the Engineer.

All accommodation facilities of whatsoever nature provided by the Contractor shall be provided with adequate sewage and wastewater collection and treatment facilities to a design and of a capacity approved by the Engineer. Under no circumstances shall untreated sewage or wastewater be discharged to the natural environment.

(6) Provision of Safety Clothing and Equipment

Insert new Sub-clause 111 (6)

The Contractor shall provide all laborers, supervisors and site staff with suitable basic safety clothing manufactured to an appropriate ISO standard. This shall include but not necessarily be limited to safety helmets and boots. Gloves shall be issued when any form of hazardous material such as cement and bitumen is being handled,

And when there is a risk off hand injury, for example when using hammers and chisels. Eye goggles shall be issued when there is a risk of eye injury, such as when using hammers. Breathing masks shall be issued when there are dusty or smoky conditions.

Additional safety equipment is to be provided by the Contractor to all workers and supervising

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staff in certain sites. In sites with moving traffic or machinery, fluorescent or brightly colored waistcoats shall be issued. Where workers are required to venture on to slopes steeper than 40 degrees, safety belt, safety clamps, harnesses and safety ropes shall be provided.

All workers and supervisory staff when on any site shall wear the basic safety clothing specified. Where additional safety equipment is required by nature of the site, then all workers and supervisory staff when on any part of that site shall use the additional equipment in addition to the basic safety clothing specified.

The Contractor shall provide a set of safety clothing to all members of the Consultant's supervising staff and keep adequate stock for personnel visiting the project.

In hot weather the Contractor shall provide appropriate lightweight safety equipment, such as cotton gloves in place of rubber gloves and canvas boots in place of rubber boots.

The Contractor shall be responsible for ensuring that all his employees and the employees of any Subcontractor and any visitor to the site comply with the Engineer's requirement to use safety clothing and equipment at all times. Failure in compliance with the Engineer's instruction in respect of safety clothing and equipment may lead to a suspension of work standard education or with-holding of payment until the Contractor complies.

(7) Provision of First Aid/Medical Facilities

Renumber existing Sub-clause 111 (6) to 111 (7) Add the following after last paragraph

The Contractor shall provide information to his workers on methods of avoiding sexually transmitted diseases and infection by HIV/AIDS.

The Contractor shall arrange all medical facilities as per Standard Operation Procedure Guideline (SOP) of ADB / Government of Nepal Guideline for COVID-19 Pandemic and any other Pandemic.

(8) Crushing Plants

Renumber existing Sub-clause 111 (7) to 111 (8)

(9) Hot Mix Plants and Batching Plants

Renumber existing Sub-clause 111 (8) to 111 (9)

(10) Hazardous Materials

Delete entire existing Sub-clause 111 (9) Hazardous Materials (all three paragraphs) and substitute Sub-clause 111 (10) Hazardous Materials

Hazardous materials are defined as cement, lime, bitumen and emulsion, paint, fuels, oils, acid of the battery, pesticides and herbicides. The Contractor may not store hazardous materials within 100 meters of seasonal or permanent water courses or springs. They must be housed in secure weather- proof buildings and protected against attacks by vermin and accidental contact by children. Contaminated runoff from storage areas shall be captured in ditches or ponds with an oil trap at the outlet. Water Quality monitoring shall be carried out as per EMP.

Any worker handling hazardous materials must be appropriately equipped as described in Sub-clause 111 (6) above.

Any hazardous material requiring disposal must be handled as described in Sub-clause 111 (2)

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above.

Explosives, detonators, blasting powder and fuses are also classed as hazardous materials. The Contractor may only bring explosives on to the site with the specific written permission of the Engineer. In this event, the Contractor is responsible for alerting the appropriate security forces and ensuring that all Government regulations are fully met concerning the transport, storage and use of explosives and associated equipment.

If the Engineer instructs the use of explosives, only controlled methods shall be used as described in Clause 904 Explosives and Blasting.

(11) Air Pollution

Insert new Clause 111 (11)

The Contractor shall avoid creating any high concentration of airborne dust or smoke within 100 meters of a house or other occupied building, or in situations likely to affect people, animals, crops or natural vegetation.

Dust from moving construction plant and road traffic shall be controlled by the regular spraying of water on the road surfaces in sites. The Contractor is responsible for all water spraying and the erection and maintenance of adequate speed bumps. The Engineer may instruct additional measures at his discretion.

Where earthwork excavations cause dust to blow into areas where it causes a nuisance, the Contractor is responsible for altering the schedule of works to minimize the nuisance. This may involve restricting the timing of work to certain hours of the day or completing works and restoring a dust-free surface as rapidly as possible. The Engineer may instruct additional measures at his discretion. Air quality monitoring shall be carried out as per EMP.

(12) Noise Pollution

Insert new Clause 111 (12)

The Contractor shall take every precaution to control excessive noise resulting in disruption to the local population and to wildlife. All static plant shall be located at least 100 meters from occupied buildings and at least 800 meters from sites deemed by the Engineer to have sensitive wildlife. The Engineer may require the construction of baffles or bunds around noisy plant in order to reduce the pollution caused.

The Contractor shall ensure that no employee plays loud music in any residential camp at any time. Noise level monitoring shall be carried out as per EMP.

(13) Special Provisions for Sensitive Ecology

Add new Clause 111 (13)

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In addition to the provisions of other Clauses, the Engineer may require the Contractor to undertake special provisions to protect any plant or animal deemed to be environmentally sensitive or otherwise worthy of unusual protection.

(14) Reinstatement of Environment

Renumber existing Clause 111 (10) to 111(14) Add between existing two paragraphs:

The Contractor shall reinstate the environment of areas polluted by the use or spillage of hazardous materials as defined in Sub-clause 111 (10). All such materials and polluted soil will be removed to a safe disposal site as described in Sub-clause 111 (2) Disposal of Spoil and Construction Waste. The site will then be restored and re-vegetated as described above. This provision applies in particular to all areas affected by bitumen.

The following sustainable technical requirements shall be carried out by the Contractor during the implementation of the Contract.

a) Preparation of project reports e.g. IEE/EIA/EMP

b) Preparation of CEMP (Contractor Environmental Management Plan)

c) Provide and maintain a healthy and safe work environment and safe systems of work.

(15) Measurement and Payment

Renumber existing Clause 111 (11) to 111 (15) Measurement and Payment

Delete the paragraph and substitute with the following:

No separate measurement and payment shall be made for the works described under this Clause.

In the event that the Contractor fails to comply these provisions then the Engineer shall withheld the equivalent amount required to carry out those activities from the Contractor's IPC and shall release after they are complied. If the Contractor does not provide them in time as per the Specifications or within the time instructed by the Engineer, the Employer upon recommendation of the Engineer may procure by quotation from third party/ies and deduct the cost incurred from the Contractor's payment including logistics, transportation costs, miscellaneous cost, if any, and administration cost.

113 Equivalency of Standards

Add new sub-clause 113(3) the following:

The Contractor shall provide and/or make available the Standards as shown in the Appendices as and when requested. There shall be no separate payment for the provision of such standards and payment shall be deemed to be included in the Contractor's rates for the provision of the Laboratory. In the event of the failure of the Contractor to provide documents for the required standards the Engineer may purchase the document and deduct the cost from the payment due to the Contractor for the provision of the Laboratory.

Add the following New Clauses after Clause 116 "Supply of Project Record":

117 Contractor's Establishment on Site

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Office, Equipment Yard, workshops, stores etc.

It is the Contractor's responsibility to acquire land for the siting of all his offices, accommodation, stores, testing facilities, equipment yards and workshops and for all temporary works and for the reinstatement of such land on completion of the Contract to the satisfaction of the owners and of the Engineer. The Contractor shall obtain the approval of the Engineer for the siting of offices, accommodation, stores, testing facilities, equipment yards and workshops before such land is acquired and he shall indemnify the Employer against all claims and charges in respect of the occupation, use and reinstatement of the land. The physical provisions of the Contractors camp shall satisfy the EMAP.

The Contractor is solely responsible for the satisfactory accommodation of all his employees and for complying with all regulations and requirements in this respect.

118 Legal Relations and Responsibility to the Public

The Contractor shall take the steps necessary to comply with the terms of the Conditions of Contract, particularly in respect of the insurances and indemnities required, and he shall comply with all regulations of statutory authorities.

119 Provision of Insurances and Securities

The Contractor shall provide all necessary Insurances, Guarantees and Securities as are required and detailed in the Conditions of Contract, Bill of Quantities or this Specification, for Phase 1: Upgrading Works and Phase 2: Performance Based Maintenance Service.

Measurement and payment for Insurances under the Contractor's All Risks (CAR) policy shall be made on Lump Sum basis as provided in the Bill of Quantities. The lump sum price for Insurance under the Contractor's All Risks (CAR) policy includes all expenditures expected in providing and maintaining from Date of Commencement until the end of the Defect Notification Period an insurance of Phase 1: Upgrading Works and until the end of acceptance of Memorandum of Final Formal Inspection of Phase 2: Performance Based Maintenance Service, Plant and Materials, the Contractor's Equipment, third party properties and personal injury or death as prescribed in the Contract document, including expenditures resulting from administration work, dealing with and reporting of claims, stamps duties, taxes, etc.

The Contractor shall also require providing insurance of his personnel, employees and labours as prescribed in the Contract document. No separate payment shall be made for the insurance of his personnel, employees and labours and are deemed included in other items of the Bill of Quantities.

No separate payment shall be made for Bank Guarantees and Securities that are required as per the Contract. The costing of such Guarantees and Securities are deemed included in other items of the Bill of Quantities.

In case of any damages to the works during PBM Service for which payment has been made by the Employer and if it is established that the damage is because of the Contractor's faulty construction during the construction or because of any other actives of the Contractor even during PBM then the Contractor shall reconstruct the same. The Cost incurred shall be fully borne by the Contractor and may claim with insurance companies if applicable. Even if the insurance

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Company does not entertain the Contractor's claim the Contractor shall not be relieved from the obligation. No payment for the reconstruction of the damaged works and PBM Service shall be made by the Employer.

Measurement of the lump sum payment for item of the Insurance for Contractors All Risk Policy (CAR) shall be made to the Contractor under the relevant items in the Bill of Quantities upon the submission of the acceptable insurance policies with the proof of payment of insurance premiums to the insurance company from the date of commencement to the end of acceptance of Memorandum of Final Formal Inspection for and after approval by the Engineer.

The payment of the quoted lump sum amount for the provision of insurance shall be made after the Contractor submits and obtains approval from the Engineer of the required insurance policies for the period covering from the Commencement Date to the acceptance of Memorandum of Final Formal Inspection of Phase 2: Performance Based Maintenance Service Period and the submission of the proof of the payment of premiums for that period.

The payment shall be made in three installments. The first installment, 80% of the amount under the respective item in the BOQ, shall be made upon approval of the insurance policy by the Engineer, the second installment, 10% shall be made after taking over of the Contract by the Employer and remaining 10% shall be made after successful completion of the Contract including phase 2.

The rate quoted by the Contractor for these lump sum items shall deem to cover the full Contract period including Defect Notification Period and PBM Service Period including any extension of time under the Contract.

120 Labour Standards

The Contractor shall abide by international standards in his treatment of workers. There shall be no discrimination between individuals on the basis of race, sex, caste or belief.

(1) Rates of Wages

The Contractor shall pay rates of wages not less favorable than those approved by the Government for the various classes of labour engaged in the same district. All payments shall be in cash unless employees request, in writing, payment by cheque or other negotiable financial instrument. Payment in kind or through trade goods of any sort is prohibited. Food rations, accommodation, or any other allowances will be over and above cash wages complying with the minimum levels described. Men and women shall receive equal rates of pay for the particular grade of work, trade or skill for which they are employed.

(2) Payment of Wages

The Contractor shall pay his employees promptly and regularly at intervals of no more than two weeks, and all employees shall be paid in full and up to date before the issue of the Engineer's Maintenance Certificate.

(3) Records

The Contractor shall keep proper records of the days, dates and hours worked by every employee

engaged on the contract, their gender, the class of work in which employed, whether as a casual or permanent employee, and the wages (and allowances if any), paid. These records shall be made available at any time for inspection by the Engineer or the Engineer's representative or any authorized representative of the Government.

(4) Default of Payment of Wages

In the event of default in payment of wages to petty contractors, local labour groups or any worker employed on the contract, by the Contractor or his Subcontractor, and, if a claim with satisfactory proof thereof is received by the Engineer, then the Employer may make the payment upon recommendation by the Engineer of such a claim out of the monies at any time payable under the contract, and the amount so paid shall be deemed payments to the Contractor under the Contract.

121 Safety Plan and Provisions

(1) Scope

This Clause covers the requirements to be met by the Contractor in relation to the safety provisions at construction sites which include workplace health and safety of the workers, all road users (drivers, passengers, pedestrians) and members of the community along the road corridors.

(2) Emergency Response Plan

An emergency response plan to deal with accidents and emergencies, including environmental/public health emergencies associated with hazardous material spills and similar events, shall be prepared for the approval of the Engineer.

(3) First Aid Base

A fully equipped first aid base shall be climatically controlled to maintain the temperature of the inside of the building at 20degrees Celsius. Arrangements for emergency medical services shall be made to the satisfaction of the Engineer.

(4) On-Site Safety Publicity

The Contractor shall ensure that safety, rescue and industrial health matters are given a high degree of publicity to all persons regularly or occasionally on the site. Posters, in Nepali and English, drawing attention to site safety, rescue and industrial health regulations shall be made or obtained from the appropriate sources and shall be displayed prominently in relevant areas of the site.

(5) Safety Training Program

A Safety Training Program is required and shall consist of:

(a) **Initial Safety Induction Courses:** All workmen shall be required to attend a safety induction course within their first week onsite.

(b) **Periodic Safety Training Courses:** Periodic safety course shall be conducted not less than once every six months. All Contractor employees will be required to participate in relevant training courses appropriate to the nature, scale and duration of the contract

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works. Training courses for all workmen on the Site and at all levels of supervision and management,

(c) Safety Meetings: Regular Safety meetings will be conducted on a monthly basis and shall require attendance by the Engineer and safety representatives of Contractors unless otherwise agreed by the Engineer. The minutes of all safety meetings will be taken and sent to the Engineer within seven (7) days of the meeting.

(d) Safety Inspections: The Contractor shall regularly inspect, test and maintain all safety equipment, scaffolds, guardrails, working platforms, hoists, ladders and other means of access, lifting, lighting, signing and guarding equipment. Lights and signs shall be kept clear of obstructions and legible to read. Equipment which is damaged, dirty, incorrectly positioned or not in working order, shall be repaired or replaced immediately.

(6) Safety Equipment and Clothing

Safety equipment, materials and protective clothing are required to be available on the site at all times and measures for the effective enforcement of proper utilization and necessary replacement of such equipment and clothing, and all construction plant and equipment used on or around the site shall be fitted with appropriate safety devices. These shall include but not be limited to:

- Effective safety catches for crane hooks and other lifting devices;
- Functioning automatic warning devices and, where applicable, an up-to-date test certificate, for cranes and hoists;
- Functioning beeping devices in all trucks and other equipment while reversing as well as operating flashing lights attached to all equipment while in motion.

(7) Requirements for Contractors' Safety Plans

The Contractor will be supplied with copies of the Environmental Management Plan (EMP) prepared by the Engineer. Provisions shall be incorporated by the contractor into all sub-contracts to ensure the compliance with the EMP at all tiers of the sub-contracting. All subcontractors shall be required to appoint a safety representative who shall be available on the site throughout the operational period of the respective sub-contract unless the Engineer's approval to the contrary is given in writing. In the event of the Engineer's approval being given, the safety representative, without prejudice to his other duties and responsibilities, shall ensure, as far as is practically possible, that employees of subcontractors are conversant with appropriate parts of the EMP.

(8) Temporary Evacuations

In the event that temporary evacuations are required due to safety or other considerations appropriate compensation will be provided to all workers.

(9) Measurement and Payment

Unless specified in the contract, no separate payment shall be made for compliance with these Safety Provisions and the costs for compliance shall be deemed to be included in the rates of the relevant Bill of Quantity items.

122 Shop Drawings of Intersections

(1) Scope

This Section covers the requirements to be met by the Contractor in relation to the survey, design, detailed layout of civil works, traffic signs and road marking of the intersections along the contract road corridors. The scope also includes the preparation of construction works traffic management plans which include management of regular traffic on existing main and side roads and management of construction traffic and traffic control and guidance schemes in order to ensure safe and acceptable level of vehicular and pedestrian traffic operation around the subject intersection and adjoin sections of roads.

A set of typical layout plans of various types of intersections are included in the drawings. The scope of this Section is to customize these typical designs to each site and produce shop drawings (plans, profile, cross sections, details, layout of traffic signs, road markings) and submit it to the Engineer for approval prior to the construction of intersection related works commence.

(2) Land Survey

The contractor shall carry out detailed topographical survey of the intersection sites showing all manmade and physical features. The survey will cover enough area required to determine all necessary elements that may have effect in the design of intersections. The survey map will also show all overhead, at grade and underground utility services and both permanent and temporary roads/ walkways.

The survey plan shall be produced at 1:500 scale with contour interval of 0.5m or as instructed by the Engineer. Where manmade drains exist, invert levels will be shown and drainage line shown clearly on the plan.

(3) Traffic Survey

Before the commencement of construction, Contractor shall undertake 12 hours (commencing 06:00 hrs and ending 18:00 hrs) turning movement traffic counts at all intersections identified in the plans in the manner prescribed by the Engineer. Traffic counts shall be done by pedestrians, cycles/rickshaws, motorcycles, three wheeler, cars (sedan, jeep, and microbus), buses (mini and conventional) and all kinds of trucks (mini tippers, conventional trucks) and reported for the period ending each 15min.

Turning movement diagrams shall be plotted by the contractor separately for the AM and PM peak hours. Where peak hours are not distinct, contractor shall seek advice from the Engineer and turning movement diagrams for hours ending specified period shall be presented together with the tabular data of turning movements. Engineer may supply to the contractor samples of the Traffic Count Table and Diagrams for guidance. Two sets of tables and diagrams (one with type of vehicles and other with Equivalent Passenger Car Units (for vehicles) shall be produced and submitted to the Engineer for reference, record and approval.

(4) Drawings

Using the type designs of the intersections (three way median open, three way median closed, four way median open, four way median closed at sections with and without service roads for four laning sections), the contractor shall prepare shop drawings of each intersection and submit

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to the Engineer for review and approval. Shop drawings of four way or three way intersections with Basic Right (BAR) Turn or Basic Left (BAL) Turn or both treatments to be constructed along two lane sections of road without service roads shall also be prepared by the contractor and submitted to the Engineer for review and approval.

Shop drawings shall be prepared using appropriate CAD software. Hand sketches shall not be accepted. Four colour copies shall be submitted to the Engineer for review and approval at least 21 days prior to the date the contractor wish to commence work at the intersection site. The contractor shall not be allowed to execute any works at intersections without getting approval from the Engineer.

Shop drawings shall include but are not limited to:

- Layout Plans (1:500 or larger as directed) showing all lines and levels as required to enable lay out of the intersection at site accurately;
- At least nine cross sections (for three way intersections) and twelve cross sections (for four way intersections);
- Traffic Signs and road marking layout plans (separate to the lay out plans showing civil works/ electrical works);
- Profile / Longitudinal section of each leg (for a length of 40 m for each leg of side roads and 200 m along each leg from the centre of intersections);
- Any other details requested by the Engineer; and
- Traffic Management Plan as per the provision of Section102

A set of drawings together with the traffic count tables and turning movement diagrams shall be signed and sent back to the Contractor for use in the construction site within one week of the receipt of the same from the contractor. All shop drawings shall be to the satisfaction of Engineer.

(5) Measurement and Payment

No separate measurement and payment for the activities required and the preparation of shop drawings at intersections shall be made. The cost for the required activities and preparation of shop drawings of intersections shall be deemed to be completely covered by the respective items of work relevant to the construction of intersections.

124. GIS Data Creation

The Contractor shall prepare and submit to the Employer 2 sets of softcopy in original formats drawing showing newly constructed road, drainage structures (Culverts, Bridges, side drains, subsurface drains), utilities (electrical, telecommunication, water supply and sewerage lines etc.) including as built drawing in a format (*.shp) suitable for transferring to GIS database at the completion of first phase works.

The "GIS Data Creation" shall be paid at its respective contract unit rate which shall be full and the final compensation to the Contractor as per Clause 112 and for the cost of all activities involved for satisfactory completion of this item.

Section 200 – Site Clearance

201 Clearing and Grubbing

(5) Payment

At the end of this Sub-clause add the following:

No payment shall be made for clearing and grubbing carried out at the sites for quarries or borrows pits, Contractor's facilities, Employer's facilities or any other area other than those areas specifically directed to be cleared and grubbed by the Engineer for the execution of the permanent works.

202 Dismantling Culverts, Bridges, Other Structures and Pavements

(2) General Para(d)

Delete the contents under (d) to (j) and replace with the followings:

(d) All operations necessary for the removal of any existing structure which might endanger new construction shall be completed prior to the start of new work

(e) All materials obtained from dismantling operations which, in the opinion of the Engineer, cannot be used or auctioned shall be disposed off as directed by the Engineer.

(f) All materials obtained from dismantling operations which, in the opinion of the Engineer, meet the requirements of the specification, may be used by the Contractor.

(g) It is envisaged that some reusable construction materials might be obtained from the dismantling of the existing structures in the project road. The Contractor shall be permitted using those construction materials if they meet the standards provisioned in these Specifications. The Contractor is advised to assess the suitability and quote his price accordingly taking into consideration of using those re- usable materials from the dismantled structures.

(h) Whatsoever written in the above sub sections the materials obtained from the dismantling of electric poles, conductors, stay sets, telephone cabinets, steel telephone poles and solar lights shall be handed over to the concerned Nepal Electricity office.

(6) Measurement

Delete "(i) Dismantling brick/stone masonry/concrete (plain and reinforced)" and substitute:

(i) Dismantling brick and stone masonry

Delete "(iv) Dismantling timber structures cu.m" and substitute:

(iv) Dismantling timber structures lump sum

Delete "(viii) Dismantling pipe culverts no." and substitute:

(viii) Dismantling pipe culverts m.

Add

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(x) Dismantling concrete (plain and reinforced) *cu.m*

(7) Payment

At the end of this paragraph add the following words:

This payment shall be made under the respective BOQ item and the quoted rate is deemed to be included with all costs of dismantling, all costs of disposing of scrap materials, all scrap materials shall be disposed of in an environmentally sound manner approved by the Engineer which shall ensure that the existing environment is maintained free of all forms of contamination, including visual contamination, arising from the disposal of such materials.

Section 300 – Soil Improvement

301 Reinforced Soil

Add the following after the Sub-clause (2) "Design":

The Contractor shall design/review reinforced soil structure to cater for all the design loads including earth pressure, surcharge, live loads, seismic loads etc., as per Annexure 300-1 of Standard Specifications for Road and Bridges Works-2073 (with Second Amendment, 2078) and National Highway traffic and other design criteria specified in IRC codes. During the design/review of the reinforced soil wall, the Designer shall consider global stability, external and internal stability under standard and seismic loading. The design of reinforced soil structure shall be based on the actual site conditions and shall match with the approved construction drawings of bridges/flyovers/underpasses/ROB etc.

The Contractor shall submit within **three months from the date of commencement** to the Engineer, the complete proposal including design, computation and working drawing, and also the methodology proposed to be adopted for the works. The submission shall include the following:

I. Existing ground levels including cross-sections that have been verified by the contractor for each location involving the construction wholly or partially in the original ground.

II. Layout of walls, detailed design calculations and drawings, material specifications and construction methodology including quality control and quality assurance of different components.

III. Earthwork requirements, and results of tests conducted on selected fill material.

IV. Details of drainage systems and any other facilities.

V. Test results of soil reinforcing structural element from manufacturers/ suppliers.

VI. Test results of various materials from an independent laboratory acceptable to the Engineer.

VII. Any other information required in the plans or special provisions or requested by the Engineer.

The Contractor shall furnish design, drawings, method statement, QA plan etc., for approval by the engineer and make his own arrangements to secure the supplies and services needed. The Contractor needs to consider and take due care that the reinforced soil structure is a product of specialized technology.

The contractor shall arrange presentation after submission of Draft Report of the complete Design at venue suggested by the Engineer. The presentation team shall include at least a Bridge Engineer, a Geotechnical Engineer and Hydrologist involved in design.

Drawings

The Contractor shall prepare all necessary drawings required for the construction of reinforced

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earth structure and submit to the Engineer for their approval.

Drawing and drawing approval from Employer

The Employers shall approve design and drawing after checking and recommendation from the Employer's Representation/Consultants.

Specification of Works

The Contractor shall adhere to the Standard Specifications for Road and Bridge Works, 2073, Amendment 2075, published by Department of Roads, for material, workmanship and procedure and Special Provision for the contract.
The following specification for Mechanically Stabilized Earth with Concrete facing shall be followed:
Reinforced soil Structure using RCC Precast Panel Made from M35 Grade Concrete (Using 43/53 Grade ordinary Portland Cement) as Fascia of minimum 160mm thickness and 50mm/70mm wide Geo synthetic strap soil reinforcement made of polyester yarns and encapsulated in LLDPE Sheathing with top three layers of soil reinforcement having high coefficient of apparent Friction (using trapezoidal grooves on both sides of the geo synthetic strap) and the minimum coefficient of apparent friction at the top most layer shall be 1.5, using active connectors between fascia and soil reinforcement as per recommendation of BS-8006 for High seismic zone, Non-woven geotextile made of polypropylene (Minimum Mass 140grams/sqm) EPDM Bearing Pads complete up to 15m wall height.
For Backfill/Stabilized Earth in the MSE wall, the material shall meet the following requirements:
Angle of internal friction (phi) of reinforced as well as retained fill soil > 32 deg
Bull Density (shi) of reinforced as well as retained fill soil < 20 KN/m3
Cohesion(C) = 0
Coefficient of Uniformity (Cu) >= 2.0
5.0<=PH<=9.0
Grain Size< 75 mm should not be more than 15%
Permeability >= 2*10^5 m/s (Only for laterite and soils of similar origin)

Section 500 – Quality Control

505 Testing Procedure and Set of Tests

Delete the final words of the second paragraph commencing "as per the prevalent accepted ….." and substitute with:

"In accordance with National Specifications stipulated by the Engineer. In case no such National Specifications are prevalent then tests shall be carried out in accordance with the directions of the Engineer."

507 Site Trials or Trials Sections

(3) Production of Materials and Crushing Plant

In the second line of the first paragraph of this Sub-clause; after the words "to be processed using…." Insert the following:

"the initial material collection procedures,"

510 Schedule of Tests

Add the following after the second paragraph of the Sub-clause ending with the words "main types of works".

"The testing frequencies set forth are desirable minimums and the Engineer shall have the full authority to carry out additional tests as frequently as he may deem necessary to satisfy himself that the material and works comply with these Specifications".

Section 600 – Materials and Testing of Materials

603 Sources of Materials

Add the following at the end of the last paragraph of this Clause:

"These provisions regarding delivery and haulage shall not apply to any material salvaged from the site of the works and the Contractor shall be entirely responsible for all haulage and costs of haulage of such salvaged material."

604 Inspection and Acceptance of Materials

Delete the second and third paragraphs of this Clause and substitute with the following:

"A preliminary inspection of the materials may be made at the source for the convenience and accommodation of the Contractor, but neither the presence of the Engineer nor the subsequent testing of work or materials by the Engineer shall relieve the Contractor of his responsibility for furnishing work and materials complying with these Specifications.

The representative of the Engineer shall have free entry at all times to those parts of any plant which concern production of any materials for incorporation into the Works and the Contractor shall ensure that any order for materials which he places includes the necessary provisions to ensure that such free entry is available."

613 Stone, Aggregate, Sand and Fillers

Amend Table 6.5: Tests Procedures Applicable to Stone Aggregate and Fillers as follows:

Add

iii) a. Flat and Elongated Particles for AC ASTMD4791

xxi)	Fine Aggregate Angularity	AASHTO T 304 Method A
xxii)	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregates(CAFF)	ASTM D5823

Section 700 – Pipe Drains, Pipe Culverts and Concrete Channels

702 Concrete Channeling

In the heading of this Clause after the word "Concrete" add the words "and Stone Masonry"

In Sub-clause (1) Scope after the word "concrete" add the words "and stone masonry"

At the end of Sub-clause (2) Materials add the following additional paragraph:

"Channels may also be constructed of masonry where directed or shown on the drawings. Masonry channels shall be fitted with precast concrete cover slabs where directed or shown on the drawings."

In Sub-clause (3) Construction (a) Excavation and Bedding after the word "concrete" in the penultimate line add the words "or stone masonry".

At the start of Sub-clause (3) Construction (b) add:

"The length of the precast channel (if any) section shall be uniform throughout and shall be equal to 3m, except where shorter sections are necessary for closures and where otherwise shown on the Drawing.

At the end of Sub-clause (3) Construction add the following additional item:

(d) Stone Masonry Channels

"Stone masonry channels shall be constructed in accordance with the lines levels and dimensions for the various types of channel shown on the drawings.

They shall be constructed throughout of Random Rubble Stone Masonry set in sand cement mortar having a minimum strength of 5.0 MPa and the stone/mortar matrix shall be complete and solid throughout the whole of the structure.

The joints in the exposed faces of the channels shall be carefully pointed up to provide a neat, well- sealed surface.

Where the channel type requires the provision of a reinforced concrete cover slab these shall be manufactured in an approved casting yard in accordance with the details in the drawings or as directed by the Engineer. The upper surfaces of the channel walls where these are required to carry cover slabs shall be carefully dressed and mortared to provide a smooth, strong, accurate bearing surface."

(5) *Delete the contents under sub-section "702 (5): Measurement" and replace with the followings:*

Unless stated otherwise, concrete for precast/cast in situ concrete channeling shall be measured in Cubic meter under relevant item in the BOQ, Formworks shall not be measured separately. Similarly, reinforcement for precast/cast in situ Concrete-channeling shall be measured in Metric Tons under relevant item in the BOQ.

Excavation and bedding shall be measured as provided under respective Sections of these Specifications.

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"Excavation for channels at or near the road edge shall be classified as general roadway excavation and shall be paid as either excavation to spoil or as formation of embankment as appropriate. In the event that channels are directed to be constructed more than 5 meters from the back of the shoulder, excavation for channels shall be paid as excavation for structures."

(6) *Delete the contents under sub-section "702 (6): Payment" and replace with the followings:*

Concrete and reinforcement for precast/ cast in situ concrete channeling shall be paid as per the respective contract unit rates which shall be the full and the final compensation to the Contractor as per Clause 112. Excavation and bedding shall be paid as provided under respective Sections of these Specifications.

Add sub-section 704

704 Specifications for the works of Nepal Telecom

(Technical Specification of Laying of PLHDPE 40/33 Duct Pipe**)**

The provision in Part II- Employer's Requirements

"Add sub-section 704 Technical Specification for Laying of Permanent Lubricated High-Density Polyethylene (PL-HDPE) 40/33 Duct Pipe [For Nepal Telecom Works]

1.0 GENERAL:

All the works shall be undertaken in compliance with the tender specifications and with the due approval of The Employer of the procedures and drawings. Decision of THE EMPLOYER shall be final and binding in all matters without any cost implication whatsoever.

1.2 ALIGNMENT OF THE TRENCH:

Contractor should carry out detailed implementation plan of route in coordination with Nepal Telecom Engineer and submit the final implementation plan for approval before implementation. The final report shall include at least the following:

a) A drawing of the proposed Telecom duct route indicating all details including bridges, culverts, causeways, over/under bridges, other important landmarks, etc.
b) The distance of the Telecom duct route from the center of the median of road shall be indicated on the route maps as well as documented in tables.
c) Location and number of manholes.
d) Location of all turns, bends, crossings and major landmarks.

1.3 TRENCHING: DEPTH & WIDTH:

The PL-HDPE duct shall be laid at a depth of minimum 1.3 m in all types of soil and section of trench shall be as specified in the drawings.

PL-HDPE pipe, fittings (couplings) and warning tape shall be provided at contractor site yard by Nepal Telecom (NTC).

1.4 LAYING OF DUCT IN SHALLOW AND CULVERT CROSSING:

Excavation upto 1.3 m depth in all types of soil in the bed of shallow culvert of upto 10 meter span during dry bed conditions, laying of one way appropriate 100 mm nominal dia GI pipe (Grade-C) shall be done and PL-HDPE duct shall be pulled through the pipe.

1.5 LAYING OF DUCT ALONG BRIDGES:

1.5.1 In case it is essential to lay the duct on the bridge with 100 mm nominal dia GI pipe (Grade-C) pipe at suitable place clamped at spacing 1m to 1.5m and PL-HDPE duct shall be pulled through the pipe.

1.5.2 Laying of one no. of 100 mm nominal dia GI pipes (Grade – C) pipe hung on the outside of parapet wall with suitable clamps. PL-HDPE duct shall be pulled through the GI pipe. All the clamps, nails, Nuts, and Bolts shall be hot dip galvanized material.

1.6 ROAD CROSSINGS:

Road crossings: Excavation in soil up to 1.3 m under bituminous and other paved surfaces. Laying of 150 mm HDPE pipe 6 kg/cm2 shall be done and (40/33) two-way PL-HDPE pipe shall be laid through it.

1.7 COUPLING OF DUCT SECTIONS AND INSTALLATION OF END PLUGS:

The length of the permanently lubricated ducts should be at least 1 Km. The HDPE couplers should be installed simultaneously along with the laying of duct. In case the couplers cannot be installed to prevent entry of extraneous materials the end plugs shall be installed immediately after the duct is laid.

1.8 DUCT LAYING METHODOLOGY:

1.8.1 Duct Loading and Unloading:

Different ways unloading the HDPE duct.

- Using a forklift.
- When using a boom truck to unload the duct coil, place a bar through the reel/coil arbor, then attach a chain to the bar DO NOT wrap the chain around duct to lift the coil.
- Open the tailboard of truck, carrying coil and put wooden or metallic planks at appropriate places, sliding from the floor of the truck to ground. Roll down over these planks to rest on ground.
- Duct coil can also be dropped from the floor of truck on sand or soft soil bed of about 12" height or more.

1.8.2 Duct Mounting:

- Place "Flange No. 1" of collapsible Steel Reel on ground.
- Put Duct coil on "Flange No. 1" evenly in such a way that all holes of "Flange No.1" are accessible for fixing the traverse Bars from inner space of duct Coil.
- Put all the traverse bars inside and fix it with bolts and nuts at their respective places.
- Place "Flange No. 2" on top of the coil and fix it in place by tightening them with traverse bars by means of bolts and nuts.
- Lift the reel with the coil and mount it on proper Jack Stand with the help of a Strong iron shaft passing through the center of the collapsible Reel.

1.8.3 DUCT INSTALLATION:

For installing duct in an open trench, use one of the methods described below:

i) MANUAL LAYING:

The method is efficiently used when installing single duct in an open trench or when they are many obstructions like trees etc along the route. Steps in manual laying are:

- Place the Jack Stand along the sides of the trench.
- Observe correct drum position i.e duct should uncoiled from the bottom not from top of the drum using decoiler.
- Driven the reel slowly to avoid over spinning of reel when you are pulling HDPE Duct installation.
- Unroll the duct to the length spacing the workers after every 15-20 mtrs.
- When encountering an obstruction, utility crossing or bore, pull the HDPE Duct beyond the Obstruction until you have enough duct to maneuver it through or under the obstruction and then re-pull the duct.
- Duct can be placed into open trench either directly from a drum or temporally laid along the side of trench and placed later on.

ii) Procedure for duct laying using pulling devices and mechanical pulling machines:

- Mount duct coil on collapsible Steel Reel (Refer to Procedure for duct Mounting)
- Put the duct, wound on collapsible steel reel, on a rigid jack stand with the help of a strong iron shaft passing through the center of collapsible steel reel.
- Connect one end each of multiple ducts (already mounted on collapsible steel reel) to the pulling devices (pulling grip/pulling eye).
- Attach ducts (connected to pulling devices) to Multiple Pulling Harness.
- Connect the multiple pulling harness to suitable Mechanical Handling Machine (Excavator, Jeep etc.)
- Move the mechanical Handling Machine along the side of trench, while unwinding ducts from unwinding ducts from collapsible steel reel.
- Feed the ducts directly in to the trench without entanglement so that ducts are laid without criss crossing.

iii) Placement of duct into an open trench:

- When placing the duct into an open trench, the bottom of the trench must be reasonably flat, free of horizontal and vertical bends, and free of stones and debris.
- If surrounding soil contains sharp stones or other materials, the duct should be insulated with a protective layer of fine sand (approximately 5 to 10 cm under and above the duct).
- Place the duct as straight as possible. In case of any directional changes, keep the bending radius as big as possible. A minimum bending radius, which is 12 times the O.D. of the duct, is to be maintained.

iv) Vertical and Horizontal winding in the trench:

- Avoid sharp 90-degree bend.
- When duct takes to a vertical position, it is important to support the duct to prevent damage or kinking during restoration. To accomplish this, compact the soil under and behind the bend.
- Use backfill to make rapid changes more gradual.
- During transportation and storing at the site duct, it is necessary to seal the ends of the duct with proper End caps against water penetration or other impurities. Sand, soil, or water and other impurities significantly increase the friction between the duct and the cable outer sheet.
- When installing duct in an open trench from a drum, it should be uncoiled from the bottom and not from the top of the drum.
- When placing multiple ducts in a single trench simultaneously, it is important not to cross or twist the ducts inside the trench, when installing large quantities of ducts, it is possible to stack them one on top of the other in addition to side by side. However, positioning of the ducts must be designed in the planning stage to ensure clarity between ducts placement.
- When placement of the duct is over and connections of the duct ends are deferred to a later stage, it is advised to overlap duct ends by one meter from each side. Both ends of the duct must be

properly sealed with end plug to prevent water, dust or any other foreign particle from entering into the duct.

- Duct can be placed into an open trench either directly from a drum or temporarily laid alongside the trench and placed later on. It is not recommended to hang ducts on fences, barriers, etc. because such treatment of the ducts at higher ambient temperatures can cause harm to the ideal form of the duct. In cold weather the duct cab become brittle and freeze in those portions, which are in direct contact with the metal portion of the fence.
- When crossing the rivers and streams, duct is typically buried 160cm below the river floor (scour depth) must be executed as gradually as possible to ensure optimal cable installation lengths. Rights and wishes of the parties who win the river must be respected at all times.
- When crossing bridges, HDPE Telecom Duct can either be bound directly to the bridge frame or it can be pulled within a metal/DWC pipe fixed to the bridge frame. As always, dramatic bends should be avoided. An ideal installation has only gradual changes.
- Pump out water, if any, from the trench before placement of duct.
- Whenever tree roots are found in the trench make sure to lay the ducts under the tree roots and not the above.
- Place the duct as you walk along the trench as straight as possible.
- Tightly close the ends of the ducts with self-tightening End Plug so that no dirt, dust or moisture go into the duct.

v) Duct Spacer:

- No spacer will be used however the duct pipes should be tied together with cable tie.

vi) The installation of Plastic couplers:

vii) Cut the duct at the same place where they overlap. Cutting should be done in such a way that the duct end matches with each other perfectly because it is very important for the coupling joints to be airtight. Proper pipe shears or cutters must be used for smooth cutting. Do not use a hacksaw to cut the duct.

viii) Deburr both the inside and the outside edges of the duct with a deburring tool.

ix) Apply a small amount of proper lubricant (liquid detergent) for better installation of plastic couplers.

x) Tighten the plastic coupler with C-Spanner.

xi) End Plug:

- Close the ends of duct with end plugs so that moisture, dirt and dust do not enter inside the duct.
- It seals the duct ends completely and prevents air, moisture from entering the duct, ever when it is laid underground.
- Further interior surface of empty ducts also remains clean even after several years.
- Inspect the Neoprene Rubber for various defects such as pin holes, cuts, etc. In case of any such defect, replace the rubber gasket with a new one.

xii) Simple plug:

- When the cable is already installed inside the duct, seal the duct with "SIMPLE PLUG".
- It also saves the cable from dust, dirt, moisture et. And increases the life of cable, since the contact with moisture is eliminated.

1.9 Duct Cutter And C-spanner:

Simple duct cutter: It cuts the duct and squarely up to 40 mm O.D Rotary Duct Cutter: It cuts the duct when the cable is inside up to 63mm O.D C-spanner: used to tighten the plastic couplers properly.

1.10 How to Inspect Ducts After Placement:

After the placement of PLHDPE duct in the trench Nepal Telecom shall inspect the quality and integrity of the duct placement by conducting following tests in coordination with the engineer (supervision consultant).

1.11 Duct Integrity Test Procedure

After laying the Duct network, PLHDPE ducts shall be tested for proper laying, crush, deformity and pressure testing. The Bidder shall have to remove the obstruction/deformity of any kind before handing over of the Duct network to the Employer. Following tests are to be carried out on the laid HDPE conduit:

a. Duct Cleaning (Sponge Test)

- Compressed air should be blown through the duct in order to remove any dirt and water that has accumulated inside the duct with the help of suitable capacity Air Compressor. A short blast of air about 2-3 bar shall be blown through the duct for about 2 minutes.
- Sponge will be blown through the duct to thoroughly clean the duct from inside.

b. Crush and Deformity Test

- This test is to be done to check the integrity of the duct. During installation, while backfilling process there is a possibility of flattening, twisting or kinking of the duct. This is also possible if the duct has not been uncoiled properly and is laid improperly.
- Place the wooden shuttle in the duct. Note: wooden shuttle should be 80% of inner diameter of the duct and 150 mm in length.
- Connect the Compressor pipe fitting to the duct.
- Place the flexible wire grip to the downstream end of the duct.
- Connect the air hose supply to the compressor and the equipment.
- Open the discharge valve of the compressor and blow the shuttle through the duct. Note: The shuttle will pass through at a very high speed and must be trapped in flexible wire grip to avoid accident and injury.

c. Radio Shuttle Test

In case Wooden shuttle gets stuck inside duct then Calibration is done by a simple gadget, which consists of a sender like a small transmitter (Radio Shuttle), which is blown through the ducts by a Compressed air. Radio Shuttle gets stuck at the same point where the wooden shuttle is, inside the duct. With the help of the detector, radio shuttle is detected and obstruction (kink/deformation) is removed until the whole duct section is clear for blowing.

d. Pressure Testing

This test is carried out to detect leakage in duct, if any. Seal one end of the duct with End Coupler and then through End Coupler with valve, feed the compressed air into the duct. Raise the pressure upto 5 Bar and then observe. After observing for 30 minutes, pressure drop of upto a max. 0.5 Bar is permissible.

1.12 WARNING TAPE Laying:

The warning tape should be laid continuously in the excavated trench as per the drawing and instruction of the NT Engineer.

1.13 Specification of Joint Chamber / Manhole

The design dimensions and other details of chamber/manhole shall be as per the design and drawing included in the bid document. The manhole shall be pre cast/cast in situ according to standard design and practices of NT Engineering. The manhole shall normally be provided at every 2 km. to accommodate jointing box or any monitoring equipment if so desired.

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The manhole should be pre-cast/cast in situ RCC (M20 grade) and shall be constructed as per the drawing and the design included in the bid document and shall have steel re-enforcement as per the drawing. The cover shall include two permanently fixed iron holes for re-opening purpose. A suitable locking arrangement shall be provided.

1.14 Construction & Supervision:

The construction of Chamber, PCC, RCC, Protection Works and GI pipe works require special care and should be done under close supervision of Nepal Telecom Site Engineer in coordination with the supervision consultant for the project. Any change or reduction in the internal dimension or placing of duct entry should have prior approval from the NT Site Engineer.

1.15 Measurement and Payment:

Measurement and Payment of all items of work shall be done as per respective unit and rate of Bill of Quantity (BoQ)."

Section 900 – Earthworks

902 Definitions and General Requirements

Delete the final sentence of Sub-clause (viii). At the end of the first sentence of Sub-clause (8) add the following:

"The surveyed points thus obtained shall be used to correct or augment the existing survey data referred to in Clause 106 above."

Add new Clause 908A "PROVIDING AND LAYING SAND FILLING" after Clause 908 as follows:

908A Providing and Laying Sand Filling

Sand filling shall commence 3 days after laying of bottom plug. The level of the top of the bottom plug shall be verified before starting sand filling.

The sand shall be clean and free from earth, clay clods, roots, boulders, shingles, etc. and shall be compacted as directed. Sand filling shall be carried out up to the level shown on the drawing or as directed by the Engineer.

Sand filling not less than 300 mm layers after sprinkling with water and ramming to full consolidation. This shall be done with river or pit sand in layers. Each layer shall be well watered and rammed to full consolidation with iron rammers.

Measurement:

Measurement shall be in cubic meter calculated from the actual length, width and the depth to be taken from the compacted earth. Where the ground is not in level average depth shall be taken.

Payment: The quantities of sand filling measured as provided above shall be paid at the contract unit rate which shall be the full and final compensation to the Contractor as per Clause 112.

909 Forming of Embankment and Other Areas of Fill

Add the following additional Sub-clause:

"(10) All materials which are deposited in place prior to compaction shall be evenly spread over the whole of the designated area for the layer concerned and in such quantity that the thickness of any one layer, when measured after compaction, shall comply with the requirements specified.

Any new layer less than 75 mm in compacted thickness shall be bonded to the previous layer by scarifying the previous layer to a depth not less than 25 mm or to such greater depth so that the total compacted thickness of the new layer plus the scarified portion of the previous layer will not be less than 100 mm."

The material obtained from the roadway excavation as per the design may be used by the Contractor for the purpose of roadway embankment provided that the excavated soil meet the

requirements of the Specification.

918 Payment

At the end of Sub-clause (1) add the following:

The payment for earthwork excavation shall be made in two (2) instalments. First instalment 80% of the unit rate quoted in the Bill of Quantities shall be made after carrying out excavation works.

The second installment of remaining 20% of the unit rate quoted in the Bill of Quantities shall be made after reuse, haulage and safely dispose of the material at the locations approved by the Engineer.

Add new Clause 919 "Catch-water Drains" as follows:

919 Catch-water Drains

"Where directed by the Engineer the Contractor shall excavate catch-water drains to intercept water flowing towards the road alignment and divert it to the nearest watercourse or culvert.

Catch-water drains shall be of the size as directed by the Engineer.

Unless directed to the contrary catch-water drains shall be unlined.

Where instructed by the engineer catch water drains shall be lined with dry stone masonry or with mortared stone masonry as directed.

Where catch water drains fall outside the limits of the general works of cut and fill i.e. beyond 5 m from the back of shoulders they shall be paid for as excavation for structure at the unit rate per cu.m. of including the volume required to be excavated for any lining, under the relevant item in the Bill of Quantities.

Where catch water drains are directed to be lined the lining shall be paid for as dry stone masonry or mortared stone masonry as appropriate under the items for such work in the bills of quantities."

Section 1000 – Subgrades

1002 Definitions

(3) Capping Layer

Delete the definition and replace with:

Capping layers (also known as selected fill or selected or improved subgrade) are layers of sub-base materials laid and compacted generally over weaker materials either to aid the passage of construction traffic or to improve the condition of the layer immediately below the subbase or base layer. Such improvements may be made through the addition of imported material (materials conforming to Clause 1200, Table 12.5, 12.6 and 12.7).

1003 Preparation and Surface Treatment of Formation

In the opening paragraph delete the words of the first sentence following "the sub-base or…." to the end of the sentence and replace with "any embankment or pavement layer".

Add the following immediately after the opening paragraph:

"Preparation of formation shall also apply to the preparation of the base of embankment and shall include scarification, spreading and compaction of material across the full width of the layer or area. Such preparation shall not be measured twice at any one location.

If instructed by the Engineer, any processing of in-situ material that meets the Specification for subgrade will include scarification to a depth not less than 150 mm or to a depth as agreed with the Engineer, watering, shaping and compaction of the material. Measurement and payment for this processing shall be for the cubic metre of material so processed in accordance with the provisions in this sub-section. In this case the measurement for preparation of formation shall be deemed to be included in the rate for the provision of the layer concerned and no separate payment for preparation of formation will be made."

(1) Formation of Loose Untreated Materials

In the first sentence delete the words "particles larger than 60 mm" and replace with "particles larger than 75 mm".

Add the following after the first paragraph:

The Contractor shall arrange the provision of materials for embankment construction such that out of the suitable material, better quality materials are reserved for the subgrade and lesser quality materials are used in other embankment layers.

In the second paragraph delete the words "in the layers of 150 mm compacted depth" and replace with

"in layers not exceeding 200 mm compacted depth. Greater thicknesses of layer may be compacted provided the contractor can demonstrate that the required compaction throughout the whole layer may be obtained with the proposed equipment.

Add after first sentence in the second paragraph ending with words "150 mm compacted depth"

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the following:

Where the new formation is to abut an existing embankment as part of road widening, the Contractor shall ensure that any new layer of fill shall be benched into the old embankment for formation in a manner that comply with Clause 912 of these Specifications.

At the end of Clause 1003 add the following additional Sub-clauses:

(6) Widening to Embankment and Use of Existing Pavement Material

Widening of the road embankment, where required, shall proceed from the formation in the following manner:

a) Scarify the existing sub-grade up to a depth of 300 mm and re-compact it as described in Sub- clause 1003(1).

b) If the sub-grade is very weak, the sub-grade shall be strengthened by capping layer (Clause 1004) or by blending the scarified sub-grade material with granular material pursuant to Clause 1002 (5) Mechanical Stabilization as per the instruction of the Engineer.

c) The mechanical stabilization with granular material shall be to ensure a minimum CBR of 8.

No separate payment shall be made for works carried out under Sub-clause 1003 (6) (a). Measurement for the subgrade layer shall be in accordance with the relevant Clauses of the Specification. Providing and laying of capping layer shall be measured and paid as per Clause 1004.

Providing, blending and laying of granular material for mechanical stabilization of sub-grade pursuant toSub-clause1003(6)(b) and(c)will be measured in cubic meter and paid for granular material only. The contractor may use existing pavement material for the construction of the road pavement layers providing the material so used meets the required Specification for the layer in which the material is used. When this material is used it shall be spread across the full width of the layer. No separate measurement or payment shall be made for this operation.

1004 Capping Layer

Delete the first sentence and replace with:

Where shown on the drawings a Capping (Selected Sub Grade - SSG) Layer (either type 1 or type 2) shall be placed at, or on, the top of the subgrade to a thickness as indicated on the drawings. The materials for this layer may be from borrow pits. The Contractor shall demonstrate that suitable for the purpose. Any use of in-situ material shall be subject to the Engineer's approval.

If instructed by the Engineer any processing of in-situ material that meets the Specification for the capping layer will include scarification to a depth not less than the specified thickness of capping layer or to a depth as agreed with the Engineer, watering, shaping and compaction of the material.

Measurement and payment for this processing shall be for the cubic metre of materials processed in accordance with the provisions in this sub-section. In this case no separate payment for preparation of formation will be made.

(2) Material Requirements

Delete the contents and replace with the following requirements:

Material and Testing Requirements for Capping Layers

Materials conforming to Clause 1200, Table 12.5, 12.6 and 12.7

1005 Mechanical Stabilization

(1) General

Delete the first and second paragraphs and replace with:

The extent of mechanical stabilization shall be at the Contractor's discretion.

(2) Material Requirement

(a) Stabilizer

Delete and replace with:

The Contractor is at liberty to mechanically stabilize any material, whether in-situ or imported, to provide any pavement layer material, provided that the resulting material is in conformity with the Specification.

The type and amount of stabilizer used shall be such that when mixed with the in-situ or imported material the specified requirements for the layer material are achieved.

(b) Stabilized Material Requirements

Delete this sub-section:

(3) Amount of Stabilizer to beaded

Delete this sub-section

1007 Measurement

Delete the Contents in the Section 1007 and replace with the followings:

1) The scarification of the existing blacktop surface shall be measured in square meter by multiplying average of widths taken at intervals of 10 meter along the centre line of the road multiplying by the respective lengths.
2) Loosening, leveling and Compacting original ground support embankment shall be measured in square meter by multiplying average of widths taken at intervals of 10 meter multiplying by the respective lengths.
3) Subgrade preparation in existing pavement in cutting or filling shall be made in square meter by multiplying average of widths taken at intervals of 10 meter multiplying by the respective lengths.
4) Whatsoever written above, no separate measurement for subgrade preparation shall be made if the formation level is obtained after roadway embankment provided that the compacting original ground support is separately measured.

1008 Payment

Add following paragraph at the end of this sub clause:

In the area/section where "Loosening, leveling and Compacting original ground support embankment" were carried out for formation of sub grade or for formation of road way embankment and if they are measured and paid separately under respective pay item in the BOQ then only remaining area shall be measured and paid under formation of subgrade preparation in the BOQ.

Section 1100 – Road Works Overall Requirements

1101 Horizontal Alignments, Surface Levels and Surface regularity of Pavement Courses

Add the following:

(3) (a) Remedial Work

When upon examination by the Engineer any part of the Works or any plant fails to conform to the Specification requirements, or is at any stage before final acceptance damaged so that it no longer conforms to the requirements of the Specifications, the Engineer shall instruct its complete removal and replacement, at the Contractor's expense, with satisfactory work, plant or material. In special cases the Engineer may instruct the Contractor to apply remedial measures in order to make good any such defects or damage.

The actual remedial measures taken shall be entirely at the Contractor's own cost but subject to the Engineer's approval regarding the details thereof.

In particular remedial measures shall ensure that the final product is in full compliance with the Specifications, shall not endanger or damage any other part of the Works and shall be carefully controlled and submitted to the Engineer for examination when completed or at any intermediate stage as may be required.

For the guidance of the Contractor an indication about what may be required in the more common cases of defects or damage is given below, but the Engineer will in no way be bound to approve of or adhere to the measures indicated, as the actual remedial measures will be dictated by the circumstances of each particular case.

Earthworks

i) Where a cut slope has been over-excavated, reinstatement by backfilling will not normally be permitted and the entire slope may need to be re-trimmed to obtain a uniform slope;

ii) Where the floor of a cutting has been over excavated it will normally require backfilling and re-compaction with approved material of higher quality then the cut material. All necessary measures shall be taken to drain ground water that may accumulate in backfilled sections;

iii) Excess widths of fills will need to be trimmed to the design profile;

iv) Where erosion has occurred on the surface of cuts or fills, the damage shall be made good by backfilling with suitable material and re-trimming. In more serious cases the slope may have to be cut back and backfilled after benching and compacted to the required standard of compaction with suitable small equipment followed byre-trimming.

Local Defects in Pavement Layers

i) Where remedial measures are taken to make good localized defects the length and width of the area to be repaired by equipment shall be such as to accommodate the full width of the equipment used and of a reasonable length to ensure effective repair;

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ii) The depth to which material will have to be removed will depend on the defect and the type of material. Gravel layers will need to be broken up to a depth of at least 75mm and crushed stone will usually need breaking up over its full depth. Asphalt material will normally require removal for its full depth.

Section 1200 – Sub-base, Base, Hard Shoulder and Gravel Wearing Course

1201 Granular Sub-base

(1) Scope

Add at the end "crushed or otherwise".

Add an additional paragraph at the end as follows:

The scope of works includes:

(a) Construction of new sub base in one or two layers as instructed by the Engineer over carriageway and shoulder in accordance with the stipulations laid down in Clause 1003 and relevant Sub Clauses;

(b) Construction of sub base layer over shoulders or as shown in the drawing or as instructed by the Engineer utilizing the sub base and base material from the existing pavement in accordance with the stipulations laid down in Clause 1003 and relevant Sub Clauses.

(2) Sources of Material

Add to the second paragraph after "……..or from such other sources"

"or from material obtained during scarification of existing pavement surface granular course if satisfy the required quality for sub base"

(3) Material Requirement

Add to the first paragraph:

"The specific grading requirement shall be controlled before and after the material has been transported, stockpiled, mixed, spread and compacted".

Replace the last sentence of sub clause 1201 (3) by following:

"Grading to be adopted for granular sub base material shall be Grade II for upper sub base and Grade III for lower sub base"

(5) Laying and Compacting

Add the following at the beginning:

The sub-base shall be constructed after checking that the underlying layer conforms to the specified requirements and has been approved by the Engineer.

Add the following at the end:

The Contractor shall protect and maintain the sub base at his own expense. Maintenance shall include the immediate repair of any damage or defects which may occur and shall be repeated as often as is necessary to keep the sub base continuously intact. Repairs shall be done in such a manner that will ensure restoration to an even and uniform surface and may involve scarifying, watering and re-compacting.

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1205 Shoulder Island and Median

Add Sub Clause 3a after sub clause 3[Construction of shoulder]

3a. Construction of Island and Median

Island and median filling material shall be placed and compacted in layers in compliance with the requirement of clause 910 [Compaction of embankment and other area of fill/back fill]. The filling shall be placed in by such method which shall avoid loading the structures (Kerb stone, sub surface drain and geo membrane layer, abutment of culverts, retaining structures near the bridges, abutments of box bridges and twin bridges) in any manner which may affect its stability or overload its underlying foundation material or substructure. The back fill in front of such structures shall be placed first to avoid the possibility of forward movement. Precaution shall be taken to prevent any wage action against the upright surfaces, and the slopes of bounding the excavation (if any) shall be stepped as directed by the Engineer before filling is placed.

Add following paragraph at the end of the sub clause 6 [Measurement and payment]

Construction of island and median shall be measured in cubic meter by taking cross section at interval of 10m or as directed by the Engineer and shall be paid at their respective contract unit rate which shall be full and final compensation to the contractor as per clause 112 of the Specification.

1208 Wet Mix Macadam Base and Sub base

(3) Material Requirement

Add at the end of 3(b) following:

"Physical requirement for material for wet mix macadam base is B1"

Section 1300 – Bituminous Surface and Base Course

1302 Prime and Tack Coat

Replace VG 10 by VG 30 at the Sub Clause 1302(2) "Material" in para 2

(4) Spraying of Prime Coat and Tack Coat

Add the following:

Spray record sheets containing details of ambient temperature, spraying temperature, areas sprayed and quantities of materials used shall be submitted by the Contractor on a daily basis for approval by the Engineer.

Following the prime coat application, the primed, un-blinded surface shall be allowed to cure for a minimum 24 hours, or for a time as agreed with the Engineer, without being disturbed so as to allow the prime coat to fully penetrate the surface unless full penetration and curing has taken place in the opinion of the Engineer in a shorter period. If after this period the prime coat has not sufficiently cured to permit trafficking without being picked up, and the Contractor wishes to open the section to traffic, the Engineer shall either instruct that the area be left for a further period until the prime coat has fully penetrated and aired to allow traffic to pass or shall permit the Contractor to place mineral aggregate for blinding, at his own cost, applied at a rate and in the places instructed to blot up the excess bitumen. Where the Engineer agrees that blinding is necessary in limited areas to permit the unavoidable movement of traffic, at locations such as road junctions, the Contractor shall place mineral aggregate for blinding applied at a rate and in the places agreed and shall be paid for this work at the rate in the Bills of Quantities.

As soon as the primed surface has cured sufficiently or sufficient mineral aggregate for blinding has been applied to allow traffic to pass over the road without the prime coat being picked up, the road shall, where practicable, be opened to public traffic for a period of 14 days or less if agreed by the Engineer. During this period the primed area under traffic shall be maintained and all damage caused by traffic shall be repaired as instructed by the Engineer at no extra cost. Thereafter the contractor shall maintain the primed surface and shall protect the surface until the application of surfacing by taking suitable precautions including for example supplying and spreading a protective layer of sand at no extra cost.

(7) Testing

Add the following at the beginning:

Samples of the bituminous material that the Contractor proposes to use, together with a statement as to their source and character shall be submitted and approved before use of such material. The Contractor shall require the manufacturer or producer of the material to furnish material subject to this and all other pertinent requirements. Only satisfactory materials, so demonstrated by service tests, shall be acceptable.

The Contractor shall furnish vendor's certified test reports for each consignment of bituminous material supplied. The reports shall be delivered to the Engineer before permission is granted for use of the material. The furnishing of the vendor's reports shall not be interpreted as basis for final

acceptance. All such test reports shall be subject to verification by testing samples of materials received.

1308 Dense Bituminous Macadam

(2) Material

Replace first sentence of (e) aggregate grading and binder content by following:

"When tested in accordance with IS:2386 Part I (wet sieving method), the combined grading of the course and fine aggregate the filler for the particular mixture shall fall within the limits given in Table 13.28 for grading 2."

1309 Asphalt Concrete/ Bituminous Concrete

(2) Material

Replace last sentence of (e) aggregate grading and binder content by following:

"The grading shall be 1 as per table 13.33."

Add new Clause 1318 "Dry Lean Concrete" after Clause 1317 as follows:

1318 Dry Lean Concrete

Scope

The work shall consist of construction of (zero slump) dry lean concrete sub-base for cement concrete pavement in accordance with the requirements of these Specifications and in conformity with the lines, grades and cross-sections shown on the drawings or as directed by the Engineer. The work shall include furnishing of all plant and equipment, materials and labour and performing all operations, in connection with the work, as approved by the Engineer.

The design parameters of dry lean concrete sub-base, viz., width, thickness, grade of concrete, details of joints, if any, etc. shall be as stipulated in the drawings.

Materials

Sources of Materials

The Contractor shall indicate to the Engineer the source of all materials with relevant test data to be used in the dry lean concrete work sufficiently in advance and the approval of the Engineer for the same shall be obtained at least 45 days before the scheduled commencement of the work in trial length. If the Contractor later proposes to obtain the materials from a different source during the execution of main work, he shall notify the Engineer with relevant test data for his approval at least 45 days before such materials are to be used.

Cement

Any of the following types of cement may be used with prior approval of the Engineer:

S. No.	Type	Conforming to
i)	Ordinary Portland Cement 43 Grade	IS:8112
ii)	Portland Slag Cement	IS:455
iii)	Portland Pozzolana Cement	IS:1489-Part I

If the subgrade soil contains soluble sulphates in a concentration more than 0.5 percent, sulphate resistant cement conforming to 18:6909 shall be used.

Cement to be used may preferably be obtained in bulk form. It shall be stored in accordance with stipulations contained in Clause and shall be subjected to acceptance test prior to its immediate use.

Fly-ash

Fly-ash upto 20 percent by weight of cementitious material (cement+flyash) may be used along with 43/53 grade cement may be used to replace OPC cement grade 43 upto 30 percent by weight of cement. Fly-ash shall conform to 18:3812 (Part 1) and its use shall be permitted only after ensuring that facilities exist for uniform blending through a proper mechanical facility with automated process control like batch mix plant conforming to 18:4925 and 18:4926.

Aggregates

Aggregates for lean concrete shall be natural material complying with 18:383. The aggregates shall not be alkali reactive.The limits of deleterious materials shall not exceed the requirements set forth in Table. In case the Engineer considers that the aggregates are not free from dirt, the same may be washed and drained for at least 72 hours before batching, or as directed by the Engineer.

Coarse Aggregates

Coarse aggregates shall comply with Clause , except that the maximum size of the coarse aggregate shall be 26.5 mm, and aggregate gradation shall comply with Table.

Fine Aggregates

The fine aggregate shall comply with Clause.

The material after blending shall conform to the grading as indicated in

Table Aggregate Gradation for Dry Lean Concrete

Sieve Designation	Percentage by Weight Passing the Sieve
26.50 mm	100
19.0 mm	75-95
9.50 mm	50-70
4.75 mm	30-55
2.36 mm	17-42
600 micron	8-22
300 micron	7-17
150 micron	2-12
75 micron	0-10

Water

Water used for mixing and curing of concrete shall comply with Clause

Storage of Materials

All materials shall be stored in accordance with the provisions of Clauses of these specifications and other relevant IS Specifications.

Proportioning of Materials for the Mix

The mix shall be proportioned with a maximum aggregate cementitious material ratio of 15:1. The water content shall be adjusted to the optimum as per Clause for facilitating compaction by rolling. The strength and density requirements of concrete shall be determined in accordance

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with Clauses by making trial mixes. Care should be taken to prevent one size of aggregate falling into the other size of the hopper of the feeding bin while loading the individual size of aggregates into the bins.

Moisture Content

The optimum water content shall be determined and demonstrated by rolling during trial length construction and the optimum moisture content and degree of compaction shall be got approved from Engineer. While laying in the main work, the lean concrete shall have a moisture content between the optimum and optimum + 2 percent, keeping in view the effectiveness of compaction achieved and to compensate for evaporation losses.

Cement Content

The cement content in the dry lean concrete shall be such that the strength specified in Clause is achieved. The minimum cement content shall be 150 kg/cu.m of concrete. In case flyash is blended at site as part replacement of cement, the quantity of flyash shall not be more than 20 percent by weight of cementitious material and the content of OPC shall not be less than 120 kg/cu.m.
If this minimum is not sufficient to produce dry lean concrete of the specified strength, it shall be increased as necessary by the Contractor at his own cost.

Concrete Strength

The average compressive strength of each consecutive group of 5 cubes made in accordance with Clause shall not be less than 10 MPa at 7 days. In addition, the minimum compressive strength of any individual cube shall not be less than 7.5 MPa at 7 days. The design mix complying with the above Clauses shall be got approved from the Engineer and demonstrated in the trial length construction.

Sub-grade

The sub-grade shall conform to the grades and cross-sections shown on the drawings and shall be laid and compacted in accordance with Clause. The subgrade strength shall correspond to the design strength specified in the Contract. As far as possible, the construction traffic shall be avoided on the prepared sub-grade.

Drainage layer

A drainage layer conforming to Clause shall be laid above the subgrade before laying the Dry Lean Concrete sub-base, as specified in the drawings and the Contract.

Construction

General

The Dry Lean Concrete shall be laid on the prepared granular drainage layer. The pace and programme of the Dry Lean Concrete subbase construction shall be matching suitably with the programme of construction of the cement concrete pavement over it. The Dry Lean Concrete sub-base shall be overlaid with concrete pavement only after 7 days of sub-base construction.

Batching and Mixing

The batching plant shall be capable of proportioning the materials by weight, each type of material being weighed separately in accordance with Clause.
The design features of Batching Plant should be such that the plant can be shifted quickly.

Transporting

Plant mix lean concrete shall be discharged immediately from the mixer, transported directly to the point where it is to be laid and protected from the weather by covering the tipping trucks with

tarpaulin during transit. The concrete shall be transported by tipping trucks, sufficient in number to ensure a continuous supply of material to feed the laying equipment to work at a uniform speed and in an uninterrupted manner. The lead of the batching plant to paving site shall be such that the travel time available from mixing to paving as specified in Clause will be adhered to. Tipping truck shall not have old concrete sticking to it. Each tipping truck shall be washed with water jet before next loading as and when required after inspection.

Placing

Lean concrete shall be placed by a paver with electronic sensor on the drainage layer or as specified in the Contract. The equipment shall be capable of laying the material in one layer in an even manner without segregation, so that after compaction the total thickness is as specified. The paving machine shall have high amplitude tamping bars to give good initial compaction to the sub-base. One day before placing of the dry lean cement concrete sub- base, the surface of the granular sub-base/drainage layer shall be given a fine spray of water and rolled with a smooth wheeled roller. Preferably the lean concrete shall be placed and compacted across the full width of the two lane carriageway, by constructing it in one go. In roads with carriageway more than 2 lanes a longitudinal joint shall be provided. Transverse butt type joint shall be provided at the end of the construction in a day. Transverse joints in the concrete pavement shall not be coterminous with the transverse construction joint of the Dry Lean Concrete.

The Dry Lean Concrete shall be laid in such a way that it is atleast 750 mm wider on each side than the proposed width including paved shoulders of the concrete pavement. The actual widening shall be decided based on the specifications of the paver, such that the crawler moves on the Dry Lean Concrete, and the cost of extra width shall be borne by the Contractor.

Compaction

The compaction shall be carried out immediately after the material is laid and levelled. In order to ensure thorough compaction, rolling shall be continued on the full width till there is no further visible movement under the roller and the surface is well closed. The minimum dry density obtained shall not be less than 98 percent of that achieved during the trial length construction in accordance with Clause. The densities achieved at the edges i.e. 0.5 m from the edge shall not be less than 96 percent of that achieved during the trial construction.

The spreading, compacting and finishing of the lean concrete shall be carried out as rapidly as possible and the operation shall be so arranged as to ensure that the times, between the mixing of the first batch of concrete in any transverse section of the layer and the final finishing of the same shall not exceed 90 minutes when the temperature of concrete is between 25°C and 30°C, and 120 minutes if less than 25°C. This period may be reviewed by the Engineer in the light of the results of the trial run but in no case shall it exceed 120 minutes.

Work shall not proceed when the temperature of the concrete exceeds 30°C. If necessary, chilled water or addition of ice may be resorted to for bringing down the temperature. It is desirable to stop concreting when the ambient temperature is above 35°C. After compaction has been completed, roller shall not stand on the compacted surface for the duration of the curing period except during commencement of next day's work near the location where work was terminated the previous day.

Double drum smooth-wheeled vibratory rollers of minimum 80 to 100 kN static weight are suitable for rolling dry lean concrete. In case any other roller is proposed, the same shall be got approved from the Engineer, after demonstrating its performance. The number of passes required to obtain maximum compaction depends on the thickness of the dry lean concrete, the compactibility of the mix and the weight and type of the roller and the same as well as the total requirement of rollers for the jobs shall be determined during trial run by measuring in-situ density and the scale of the work to be undertaken.

Except on super elevated portions where rolling shall proceed from the inner edge to the outer,

rolling shall begin from the edges gradually progressing towards the centre. First, the edge/edges shall be compacted with a roller running forward and backward. The roller shall then move inward parallel to the centerline of the road, in successive passes uniformly lapping preceding tracks by at least one half width.

A preliminary pass without vibration to bed the Dry Lean Concrete down shall be given followed by the required number of passes to achieve the desired density and, a final pass without vibration to remove roller with vibration marks and to smoothen the surface.

Special care and attention shall be exercised during compaction near joints, kerbs, channels, side forms and around gullies and manholes. In case adequate compaction is not achieved by the .roller at these locations, use of plate vibrators shall be made, if so directed by the Engineer.

The final lean concrete surface on completion of compaction shall be well closed, free from movement under roller and free from ridges, low spots, cracks, loose material, pot holes, ruts or other defects. The final surface shall be inspected immediately on completion and all loose, segregated or defective areas shall be corrected by using fresh lean concrete material, laid and compacted. For repairing honeycombed/hungry surface, concrete with aggregates of size 10 mm and below shall be spread and compacted as per Specifications. It is necessary to check the level of the rolled surface for compliance. Any level/thickness deficiency shall be corrected after applying concrete with aggregates of size 10 mm and below after roughening the surface. Surface regularity also shall be checked with 3 m straight edge. Strength tests shall be carried out, and if deficiency in strength is noticed, at least three (evenly spread) cores of minimum 100 mm dia per km shall be cut to check deficiency in strength. The holes resulting from cores shall be restored by filling with concrete of the specified strength and compacted by adequate redding.

Segregation of concrete in the tipping trucks shall be controlled by moving the dumper back and forth while discharging the mix into the same or by any appropriate means. Paving operation shall be such that the mix does not segregate.

Joints

Construction and longitudinal joint shall be provided as per the drawings.

butt type joint shall be provided at the end of the construction in a day. Longitudinal joint shall be provided only when full width paving is not possible. Transverse in Dry Lean concrete shall be staggered from the construction butt type joint in Concrete roa·verr1ent by 800-1000 mm.

Longitudinal joint in Dry Lean Concrete shall be staggered by 300-400 mm from the ·longitudinal joint of concrete pavement. At longitudinal or transverse construction joints, unless vertical forms are used, the edge of compacted material shall be cut back to a vertical plane where the correct thickness of the properly compacted material has been obtained.

Curing

As soon as the lean concrete surface is compacted, curing shall commence. One of the following methods shall be adopted:

a) Curing may be done by covering the surface by gunny bags/hessian, which shall be kept wet continuously for 7 days by sprinkling water.

b) The curing shall be done by spraying with approved resin based aluminized reflective curing compound conforming to ASTM-C 309-81 in accordance with Clause. As soon as the curing compound has lost its tackiness, the surface shall be covered with wet hessian for three days. The rate of application shall be as recommended by the supplier.

c) Wax-based white pigmented curing compound with water retention index of not less than 90 percent shall be used to cure the dry lean concrete. The curing compound shall conform to BS:7542. The compound shall be applied uniformly with a mechanical sprayer and with a hood to protect the spray from the wind. The curing compound shall be applied over the entire exposed surface of the Dry Lean Concrete, including sides and edges, at the rate of 0.2 litres/sq.m, or as recommended by the supplier.

The first application, referred to as curing application shall be applied immediately after the final rolling of Dry Lean Concrete is completed. As soon as the curing compound loses tackiness, the surface shall be covered with wet hessian for three days. The second application of curing compound also referred to as the debonding application, shall be applied 24 to 48 hours prior to the placement of the concrete pavement Any damaged Dry Lean Concrete shall be corrected prior to the second application. Normally, the manufacturer's instructions shall be followed for its application.

Trial Mixes

The Contractor shall make trial mixes of dry lean concrete with moisture contents like 5.0, 5.5, 6.0, 6.5 and 7.0 percent using specified cement content, specified aggregate grading and aggregate-cement ratio specified in Clause. Optimum moisture and density shall be established by preparing cubes with varying moisture contents. Compaction of the mix shall be done in three layers with vibratory hammer fitted with a square or rectangular foot as described in Clause. After establishing the optimum moisture, a set of six cubes shall be cast at optimum moisture for the determination of compressive strength on the third and the seventh day. Trial mixes shall be repeated if the strength is not satisfactory by increasing cement content After the mix design is approved, the Contractor shall construct a trial section in accordance with Clause.

If during the construction of the trial length, the optimum moisture content determined as above is found to be unsatisfactory, the Contractor may make suitable changes in the moisture content to achieve the satisfactory mix. The cube specimens prepared with the changed mix content should satisfy the strength requirement Before production of the mix, natural moisture content of the aggregate should be determined on a day-to-day basis so that the moisture content could be adjusted. The mix finally designed should neither stick to the rollers nor become too dry resulting in ravelling of surface.

Trial Length

The trial length shall be constructed at least 14 days in advance of the proposed date of commencement of work. At least 30 days prior to the construction of the trial length, the Contractor shall submit for the Engineer's approval a "Method Statement" giving detailed description of the proposed materials, plant, equipment, mix proportions, and procedure for batching, mixing, laying, compaction and other construction procedures. The Engineer shall also approve the location and length of trial construction which shall be a minimum of 100 m length laid in two days and for full width of the pavement The trial length shall be outside the main works. The trial length shall contain the construction of at least one transverse construction joint involving hardened concrete and freshly laid Dry Lean Concrete sub-base. The construction of trial length shall be repeated till the Contractor proves his ability to satisfactorily construct the Dry Lean Concrete sub-base.

After the construction of the trial length, the in-situ density of the freshly laid material shall be determined by sand replacement method. Three density holes shall be made at locations equally spaced along a diagonal that bisects the trial length and average of these densities shall be determined. The density holes shall not be made in the strip 500 mm from the edges. The average density obtained from the three samples collected shall be the reference density and is considered as 100 percent The field density of regular work will be compared with this reference density in accordance with Clauses

The hardened concrete shall be cut over 3m width and reversed to inspect the bottom surface for any segregation taking place. The trial length shall be constructed after making necessary changes in the gradation of the mix to eliminate segregation of the rnix. The /ower surface shall not have honey-combing and the aggregates shall not be held loosely at the edges.

The main work shall not start until the trial length has been approved by the Engineer. After approval has been given, the materials, mix proportions, moisture content, mixing, laying, compaction plant and construction procedures shall not be changed without the approval of the Engineer.

Tolerances for Surface Regularity, Level, Thickness, Density and Strength control of quality of materials and works shall be exercised by the Engineer.

Traffic

No heavy commercial vehicles like trucks and buses shall be permitted on the dry lean concrete sub-base. Construction vehicles at slow speed may be permitted after 7 days of its construction with the prior approval of the Engineer.

Measurement for Payment

The unit of measurement for dry lean concrete pavement shall be in cubic metre of concrete placed, based on the net plan area for the accepted thickness shown on the drawings or as directed by the Engineer.

Payment

The Contract unit rate payable for dry lean concrete sub-base shall be for carrying out the required operations including full compensation for all labour, materials and equipment, mixing, transport, placing, compacting, finishing, curing, rectification of defective surface testing and incidentals such as trial length to complete the work as per Specifications, all royalties, fees, storage and rents where necessary and all leads and lifts.

Add new Clause 1319 "Cement Concrete Pavement" after Clause 1318 as follows:

1319 CEMENT CONCRETE PAVEMENT

Scope

The work shall consist of construction of un-reinforced, dowel jointed, plain cement concrete pavement in accordance with the requirements of these Specifications and in conformity with the lines, grades and cross sections shown on the drawings. The work shall include furnishing of all plant and equipment, materials and labour and performing all operations in connection with the work, as approved by the Engineer.

The design parameters, viz., thickness of pavement slab, grade of concrete, joint details etc. shall be as stipulated in the drawings.

Materials

Source of Materials

The Contractor shall indicate to the Engineer the source of all materials to be used in the concrete work with relevant test data sufficiently in advance, and the approval of the Engineer for the same shall be obtained at least 45 days before the scheduled commencement of the work in trial length. If the Contractor subsequently proposes to obtain materials from a different source during the execution of main work, he shall notify the Engineer, with relevant test data, for his approval, at least 45 days before such materials are to be used.

Cement

Any of the following types of cement capable of achieving the design strength may be used with prior approval of the Engineer, but preference shall be to use at least the 43 grade or higher.

S.No.	Type	Conforming to
i)	Ordinary Portland Cement 43 Grade	IS:8112
ii)	Ordinary Portland Cement 53 Grade	15:12269
iii)	Portlant slag cement	IS:455
iv)	Portland Pozzolana Cement	15:1489-Part I

If the soil around concrete pavement has soluble salts like sulphates in excess of 0.5 percent, the cement used shall be sulphate resistant and shall conform to IS:12330.

Cement to be used may preferably be obtained in bulk form. If cement in paper bags is proposed

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to be used, there shall be bag-splitters with the facility to separate pieces of paper bags and dispose them off suitably. No paper pieces shall enter the concrete mix. Bulk cement shall be stored in accordance with Clause. The cement shall be subjected to acceptance test.

Fly-ash upto 20 percent by weight of cementitious material may be used in Ordinary Portland cement 43 and 53 Grade as part replacement of cement provided uniform blending with cement is ensured. The fly ash shall conform to IS:3812 (Part 1).

Site mixing of fly ash shall be permitted only after ensuring availability of the equipments at site for uniform blending through a specific mechanised facility with automated process control like batch mix plants conforming to IS:4925 and IS:4926. Site mixing will not be allowed otherwise.

The Portland Pozzolana Cement produced in factory as per IS:1489-Part I shall not have fly-ash content more than 20 percent by weight of cementitious material. Certificate from the manufacturer to this effect shall be produced before use.

Chemical Admixtures

Admixtures conforming to IS:9103 and IS:6925 shall be permitted to improve workability of the concrete and/or extension of setting time, on satisfactory evidence that they will not have of any adverse effect on the properties of concrete with respect to strength, volume change, a durability and have no deleterious effect on steel bars. The particulars of the admixture and the quantity to be used, must be furnished to the Engineer in advance to obtain his approval before use. Satisfactory performance of the admixtures should be proved both on the laboratory concrete trial mixes and in the trial length paving. If air entraining admixture is used, the total quantity of air shall be 5±1.5 percent for 31.5 mm maximum nominal size aggregate (in air-entrained concrete as a percentage of the volume of the mix).

Silica Fumes

Silica fume conforming to a standard approved by the Engineer may be used as an admixture in the proportion of 3 to 10 percent of cement. Silica fume shall comply with the requirements given in IS:15388-2003, IS:456-2000, IRC:SP:76 and IRC:44-2008.

Fibres

Fibres may be used subject to the provision in the design/approval by the Engineer to reduce the shrinkage cracking and post-cracking. The fibres may be steel fibre as per IRC:SP:46 or polymeric Synthetic fibres within the following range of specifications:

Effective Diameter	10 micron – 100 micron
Length	6-48 mm
Specific gravity	more than 1.0
Suggested dosage	0.6-2.0 kg/cu.m (0.2 - 0.6% by weight of cement in mix) Usage will be regulated as stipulated in IRC:44/IS:456
Water absorption	less than 0.45 percent
Melting point of this fibre shall not be less than 160°C.	
The aspect ratio generally varies from 200 to 2000.	
These synthetic fibres will have good alkali and UV light resistance.	

When fibres are used, the mix shall be so designed that the slump of concrete at paving site is 25±15 mm.

Aggregates

Aggregates for pavement concrete shall be natural material complying with IS:383 but with a Los Angeles Abrasion Test value not exceeding 35 percent. The limits of deleterious materials shall not exceed the requirements set out in Table.

Table Permissible Limits of Deleterious Substances in Fine and Coarse Aggregates

S. No.	Deleterious Substance	Method of Test	Fine Aggregate Percentage by Weight, (Max)		Coarse Aggregate Percentage by Weight (Max)	
			Uncrushed	Crushed*	Uncrushed	Crushed*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Coal and lignite	IS:2386 (Part II)-1963	1.0	1.0	1.0	1.0
ii)	Clay lumps	do	1.0	1.0	1.0	1.0
iii)	Mateirals finer than 75 μ IS Sieve	IS:2386 (Part I)-1963	3.0	8.0	3.0	3.0
iv)	Soft fragments	IS:2386 (Part II)-1963	–	–	3.0	–
v)	Shale	IS:2386 (Part II)-1963	1.0	–	–	–
vi)	Total of percentages of all deleterious materials (except mica) including Sl No. (i) to (v) for col 4, 6 and 7 and Sl No. (i) and (ii) for col 5 only		5.0	2.0	5.0	5.0

*Crushed aggregate at least one face fractured

Note: The presence of mica in the fine aggregate has been found to reduce considerably the durability and compressive strength of concrete and further investigations are underway to determine the extent of the deleterious effect of mica. It is advisable therefore to investigate the mica content of fine aggregate and make suitable allowances for the possible reduction in the strength of concrete or mortar; in cases where the stretch of the project road passes through micacious belt.

The aggregates shall be free from chert, flint, chalcedony or other silica in a form that can react with the alkalies in the cement. In addition, the total chlorides content expressed as chloride ion content shall not exceed 0.06 percent by weight and the total sulphate content expressed as sulphuric anhydride (803) shall not exceed 0.25 percent by weight. In case the Engineer considers that the aggregates are not free from dirt, the same may be washed and drained for at least 72 hours before batching, as directed by the Engineer.

Coarse Aggregates

coarse aggregates shall consist of clean, hard, strong, dense, non-porous and durable pieces of crushed stone or crushed gravel and shall be devoid of pieces of disintegrated stone, soft, flaky, elongated, very angular or splintery pieces. The maximum size of coarse aggregate shall not exceed 31.5 mm for pavement concrete. No aggregate which has water absorption more than 2 percent shall be used in the concrete mix. The aggregates shall be tested for soundness in accordance with 18:2386 (Part-5). After 5 cycles of testing, the loss shall not be more than 12 percent if sodium sulphate solution is used or 18 percent if magnesium sulphate solution is used. The Los Angeles Abrasion value shall not exceed 35. The combined flakiness and elongation index of aggregate shall not be more than 35 percent.

Fine Aggregates

The fine aggregates shall consist of clean natural sand or crushed stone sand or a combination of the two and shall conform to 18:383. Fine aggregate shall be free from soft particles, clay, shale, loam, cemented particles, mica and organic and other foreign matter. The fine aggregates shall have a

sand equivalent value of not less than 50 when tested in accordance with the requirement of 18:2720 (Part 37).

Combined Gradation of Fine and Coarse Aggregates

The combined gradation of fine and coarse aggregates shall be as per Table.

Table: Aggregate Gradation for Pavement Quality Concrete

Sieve Designation	Percentage by Weight Passing the Sieve
31.5 mm	100
26.5 mm	85-95
19.0 mm	68-88
9.5 mm	45-65
4.75 mm	30-55
600 micron	8-30
150 micron	5-15
75 micron	0-5

Water

Water used for mixing and curing of concrete shall be clean and free from injurious amount of oil, salt, acid, vegetable matter or other substances harmful to the finished concrete. It shall meet the requirements stipulated in IS:456.

Steel for Dowels and Tie Bars

Steel shall conform to the requirements of IS:432 and IS:1786 as relevant. The dowel bars shall conform to IS:432 of Grade I. Tie bars shall be either High yield Strength Deformed bars conforming to IS:1786 and grade of Fe 500 or plain bars conforming to IS:432 of Grade I. The steel shall be coated with epoxy paint for protection against corrosion.

Joint Filler Board

Synthetic Joint filler board for expansion joints shall be used only at abutting structures like bridges and shall be of 20-25 mm thickness within a tolerance of ± 1.5 mm and of a firm compressible material and complying with the requirements of IS:1838, with a compressibility more than 25 percent. It shall be 25 mm less in depth than the thickness of the slab within a tolerance of± 3 mm and provided to the full width between the side forms. It shall be in suitable lengths which shall not be less than one lane width. If two pieces are joined to make up full width, the joint shall be taped such that no slurry escapes through the joint. Holes to accommodate dowel bars shall be accurately bored or punched out to give a sliding fit on the dowel bars.

Joint Sealing Compound

The joint sealing compound shall be of hot poured, elastomeric type or cold polysulphide/ polyurethene/silicone type having flexibility, resistance to age hardening and durability as per IRC:57. Manufacturer's certificate shall be produced by the Contractor for establishing that the sealant is not more than six months old and stating that the sealant complies with the relevant standard mentioned below. The samples shall meet the requirements as mentioned in IRC:57.

If sealant is of hot poured type, it shall conform to

Hot applied sealant: IS:1834 or ASTM:3406-95, as applicable

Cold poured sealants shall be one of the following :

i)	Polysulphide	IS:11433 (Part 1), BS:5212 (Part II)
ii)	Polyurethene	BS:5212
iii)	Slicone	ASTM 5893-04

Preformed Seals

The pre-formed joint sealing material shall be a vulcanized elastomeric compound using polychloroprene (Neoprene) as the base polymer.

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The joint seal shall conform to requirements of ASTM D 2628 as given in Table.

Table : Requirement of Preformed Seals as per ASTM D 2628

S. No.	Description	Requirements	ASTM Test Methods
1)	Tensile strength, min	13.8 MPa	D 412
2)	Elongation at break	Min. 250%	D 412
3)	Hardness, Type A durometer	55 +/-5 points	D 2240
4)	Oven aging, 70 h at 100°C Tensile strength loss	20% max	D 573
5)	Elongation loss	20% max	
6)	Hardness Change Type A durometer	0 to +10 points	D 471
7)	Oil Swell, ASTM Oil 3, 70 h at 100°C Weight Change	45% max	D 1149
8)	Ozone resistance 20 percent strain, 300 pphm in air, 70 h at 40°C	No cracks	D 2240
9)	Low temperature stiffening, 7 days at -10°C Hardness Change type A durometer	0 to +15 points	
10)	Low temperature recovery, 22h at -10°C, 50% deflection	88% min	D 2628
11)	Low temperature recovery, 22h at -29°C, 50% deflection	83% min	D 2628
12)	Low temperature recovery, 70h at -100°C, 50% deflection	85% min	D 2628
13)	Compression, deflection, at 80% of normal width (min)	613 N/m	D 2628

Storage of Materials

All materials shall be stored in accordance with the provisions of Clause of the Specifications. All efforts shall be made to store the materials in proper places so as to prevent their deterioration or contamination by foreign matter and to ensure their satisfactory quality and fitness for the work. The platform where aggregates are stock piled shall be paved and elevated from the ground atleast by 150 mm. The area shall have slope to drain off rain water. The storage space must also permit easy inspection, removal and storage of the materials. Aggregates of different sizes shall be stored in partitioned stack-yards. All such materials even though stored in approved godowns must be subjected to acceptance test as per Clause of these Specifications prior to their use.

Proportioning of Concrete

After approval by the Engineer of all the materials to be used in the concrete, the Contractor shall submit the mix design based on weighed proportions of all ingredients for the approval of the Engineer vide Clause. The mix design shall be submitted at least 30 days prior to the paving of trial length and the design shall be based on laboratory trial mixes using the approved materials and methods as per IRC:44 or IS:10262. The target mean strength for the design mix shall be determined as indicated in Clause. The mix design shall be based on the flexural strength of concrete.

Cement Content

When Ordinary Portland Cement (OPC) is used the quantity of cement shall not be less than 360 kg/cu.m. In case fly ash grade I (as per IS:3812) is blended at site as part replacement of cement, the quantity of fly ash shall be upto 20 percent by weight of cementitious material and the quantity of OPC in such a blend shall not be less than 310 kg/cu.m. The minimum of OPC content, in case ground

granulated blast furnace slag cement blended, shall also not be less than 310 kg/m3• If this minimum cement content is not sufficient to produce concrete of the specified strength, it shall be increased as necessary by the contractor at his own cost.

Concrete Strength

The characteristic flexural strength of concrete shall not be less than 4.5 MPa unless specified otherwise. Target mean flexural strength for mix design shall be more than 4.5 MPa + 1.65s, where s is standard deviation of flexural strength derived by conducting test on minimum 30 beams. While designing the mix in the laboratory, correlation between flexural and compressive strengths of concrete shall be established on the basis of at least thirty tests on specimens. However, quality control in the field shall be exercised on the basis of flexural strength. It may, however, be ensur"ed that the materials and mix proportions remain substantially unaltered during the daily concrete production. The water content shall be the minimum required to provide the agreed workability for full compaction of the concrete to the required density as determined by the trial mixes or as approved by the Engineer and the maximum free water cement ratio shall be 0.45 when only OPC is used and 0.50 when blended cement (Portland Pozzolana Cement or Portland Slag Cement or OPC blended with fly ash or Ground Granulated Blast Furnance Slag, at site) is used.

The ratio between the 7 and 28 day strength shall be established for the mix to be used in the slab in advance, by testing pairs of beams and cubes at each stage on at least six batches of trial mix. The average strength of the 7 day cured specimens shall be divided by the average strength of the 28 day specimens for each batch, and the ratio "R' shall be determined. The ratio 'R' shall be expressed to three decimal places.

If during the construction of the trial length or during some normal working, the average value of any four consecutive 7 day test results falls below the required 7 day strength as derived from the value of 'R' then the cement content of the concrete shall, without extra payment, be increased by 5 percent by weight or by an amount agreed by the Engineer. The increased cement content shall be maintained at least until the four corresponding 28 day strengths have been assessed for in conformity with the requirements as per Clause. Whenever the cement content is increased, the concrete mix shall be adjusted to maintain the required workability.

Workability

The workability of the concrete at the point of placing shall be adequate for the concrete to be fully compacted and finished without undue flow.-The optimum workability for the mix to suit the paving plant being used shall be determined by the Contractor and approved by the Engineer. The control of workability in the field shall be exercised by the slump test as per 18:1199.

The workability requirement at the batching and mixing plant and paving site shall be established by slump tests carried during trial paving. These requirements shall be established from season to season and also when the lead from batching and mixing plant site to the paving site changes. The workability shall be established for the type of paving equipment available. A slump value in the range of 25 ± 15 mm is reasonable for paving works but this may be modified depending upon the site requirement and got approved by the Engineer. These tests shall be carried out on every tipping truck/dumper at batching and mixing plant site and paving site initially when the work commences but subsequently the frequency can be reduced to alternate tipping trucks or as per the instructions of the Engineer.

Any change in the source of materials or mix proportions proposed by the Contractor during the course of work shall be assessed by making laboratory trial mixes and the construction of a further trial length of length not less than 50 m unless approval is given by the Engineer for minor adjustments like compensation for moisture content in aggregates or minor fluctuations in the grading of aggregate.

Design Mix

The Contractor shall carry out laboratory trials of design mix with the materials from the approved

sources to be used as per IRC:44. Trial mixes shall be made in presence of the Engineer or his representative and the design mix shall be subject to the approval of the Engineer. They shall be repeated, if necessary, until the proportions, that will produce a concrete which complies in all respects with these Specifications, and conform to the requirements of the design/drawings.
The proportions determined as a result of the laboratory trial mixes may be adjusted, if necessary, during the construction of the trial length. Thereafter, neither the materials nor the mix proportions shall be varied in any way except with the written approval of the Engineer.

Sub-base

The cement concrete pavement shall be laid over the sub-base constructed in accordance with the relevant drawings and Specifications. It shall be ensured that the sub-base is not damaged before laying the concrete pavement. If the dry lean concrete sub-base is found damaged at some places or it has cracks wider than 10 mm, it shall be repaired with fine cement concrete (aggregate size 10 mm and down) or bituminous concrete before laying separation membrane layer.

Separation Membrane

A separation membrane shall be used between the concrete slab and the sub-base. Separation membrane shall be impermeable PVC sheet 125 micron thick transparent or white in colour laid flat with minimum creases. Before placing the separation membrane, the sub-base shall be swept clean of all the extraneous materials using air compressor. Wherever overlap of plastic sheets is necessary, the same shall be at least 300 mm and any damaged sheathing shall be replaced at the Contractor's cost. The separation membrane may be nailed to the lower layer with concrete nails. The separation membrane shall be omitted when two layers of wax-based curing compound is used.

Joints

The locations and type of joints shall be as shown in the drawing. Joints shall be constructed depending upon their functional requirement. The location of the joints should be transferred accurately at the site and mechanical saw cutting of joints done as per stipulated dimensions. It shall be ensured that the required depth of cut is made from edge- to-edge of the pavement. Transverse and longitudinal joints in the pavement and Dry Lean Concrete sub-base shall be staggered so that they are not coincident vertically and are at least 800 to 1000 mm and 300 to 400 mm apart respectively. Sawing of joints shall be carried out with diamond studded blades soon after the concrete has hardened to take the load of the sawing machine and crew members without damaging the texture of the pavement.
Sawing operation could start as early as 4-8 hours after laying of concrete pavement but not later than 8 to 12 hours depending upon the ambient temperature, wind velocity, relative humidity and required maturity of concrete achieved for this purpose.
When the kerb is cast integrally with the main pavement slab, the joint cutting shall also be extended to the kerb.
Where the use of maturity meter is specified, sawing should not be initiated when the compressive strength of the concrete is less than 2 MPa and should be completed before it attains the compressive strength of 7 MPa.

Transverse Joints

Transverse joints shall be contraction, construction and expansion joints constructed at the spacing described in the drawings. Transverse joints shall be straight within the following tolerances along the intended line of joints.
i) Deviations of the performed filler board (IS:1838) in the case of expansion joints from the intended line of the joint shall not be greater than ±10 mm.
ii) The best fit straight line through the joint grooves as constructed shall be not more than 25 mm from the intended line of the joint.
iii) Deviations of the joint groove from the best fit straight line of the joint shall not be greater than

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10 mm.

iv) Transverse joints on each side of the longitudinal joint shall be in line with each other and of the same type and width. Transverse joints shall have a sealing groove which shall be sealed in compliance with Clause.

Contraction Joints

The contraction joints shall be placed transversely at pre-specified locations as per drawings/ design using dowel bars. These joints shall be cut as soon as the concrete has undergone initial hardening and is hard enough to take the load of joint sawing machine without causing damage to the slab.

Contraction joints shall consist of a mechanical sawn joint groove, 3 to 5 mm wide and one- fourth to one-third depth of the slab ± 5 mm or as stipulated in the drawings and dowel bars complying with Clause.

Contraction joint shall be widened subsequently to accommodate the sealant as per Clause, to dimensions shown on drawings or as per IRC:57.

Expansion Joints

The expansion joint shall consist of a joint filler board complying with Clause and dowel bars complying with Clause and as detailed in the drawings. The filler board shall be positioned vertically with the prefabricated joint assemblies along the line of the joint within the tolerances given in Clause·The adjacent slabs shall be completely separated from each other by the joint filler board.

Transverse Construction Joint

Transverse construction joint shall be placed whenever concreting is completed after a day's work or is suspended for more than 30 minutes. These joints shall be provided at location of contraction joints using dowel bars. If sufficient concrete has not been mixed to form a slab extending upto a contraction joint, and if an interruption occurs, the concrete placed shall be removed upto the last preceding joint and disposed of. At all construction joints, steel bulk heads shall be used to retain the concrete. The surface of the concrete laid subsequently shall conform to the grade and cross sections of the previously laid pavement. When positioning of bulk head/stop-end is not possible, concreting to an additional1 or 2 m length may be carried out to enable the movement of joint cutting machine so that joint grooves may be cut and the extra 1 or 2 m length is cut out and removed subsequently after concrete has hardened.

After minimum 14 days of curing, in case OPC cement is used and 16 days of curing when flyash or blended cement is used, the construction joint shall be widened to accommodate the sealant as per Clause to dimensions shown on drawing or as per IRC:57.

Longitudinal Joint

The longitudinal joints shall be constructed by forming or by sawing as per details of the joints shown in the drawing. Sawed longitudinal joints shall be constructed when the concrete pavement placement width exceeds 4.5 m. The groove may be cut after the final set of the concrete. Joints should be sawn to at least one-third the depth of the slab ±5 mm as indicated in the drawing. The joint shall be widened subsequently to dimensions shown on the drawings.

Where adjacent lanes of pavement are constructed separately using slip form pavers or side forms, the tie bars may be bent at right angles against the vertical face/ side of the first lane constructed and straightened before placing concrete in the adjacent lane. Broken or damaged tie bars shall be repaired or replaced as required.

The groove for sealant shall be cut in the pavement lane placed later.

Tie Bars

Tie bars shall be provided at the longitudinal joints as per dimensions and spacing shown in the drawing and in accordance with Clause . The direction of the tie bars at curves shall be radial in the direction of the radius.

Dowel Bars

Dowel bars shall be mild steel rounds in accordance with Clause with details/dimensions as indicated in the drawings and free from oil, dirt, loose rust or scale.

They shall be straight, free of irregularities and burring restricting slippage in the concrete. The sliding ends shall be sawn or cropped cleanly with no protrusions outside the normal diameter of the bar. Any protrusions shall be removed by grinding the ends of the dowel bars. The dowel bar shall be supported on cradles/dowel chairs in pre-fabricated joint assemblies positioned prior to the construction of the slabs or mechanically inserted with vibration into the plastic concrete by a method which ensures correct placement of the bars besides full re-compaction of the concrete around the dowel bars.

Unless shown otherwise on the drawings, dowel bars shall be positioned at mid depth of the slab within a tolerance of ±20 mm, and centered equally about intended lines of the joint within a tolerance of ±25 mm. They shall be aligned parallel to the finished surface of the slab and to the centre line of the carriageway and to each other within tolerances given here-in-under, the compliance of which shall be checked as per Clause.

i) For bars supported on cradles prior to the laying of the slab:

a) All bars in a joint shall be within ±2 mm per 300 mm length of bar

b) 2/3rd of the number of bars shall be within ±3 mm per 500 mm length of bar

c) No bar shall differ in alignment from an adjoining bar by more than 3 mm per 300 mm length of bar in either the horizontal or vertical plane

d) Cradles supporting dowel bar shall not extend across the line of joint i.e. no steel bar of the cradle assembly shall be continuous across the joint.

ii) For all bars inserted after laying of the slab except those inserted by a Dowel Bar Inserter the tolerance for alignment may be twice as indicated in (i) above.

The transverse joints at curves shall be radial in the direction of the radius.

Dowel bars, supported on cradles in assemblies, when subject to a load of 110 N applied at either end and in either the vertical or horizontal direction (upwards and downwards and in both directions horizontally) shall conform to be within the limits given in Clause.

The assembly of dowel bars and supporting cradles, including the joint filler board in the case of expansion joints, shall have the following degree of rigidity when fixed in position:-

i) For expansion joints, the deflection of the top edge of the filler board shall be not greater than 13 mm, when a load of 1.3 kN is applied perpendicular to the vertical face of the joint filler board and distributed over a length of 600 mm by means of a bar or timber packing, at mid depth and midway between individual fixings, or 300 mm from either end of any length of filler board, if a continuous fixing is used. The residual deflection after load shall be not more than 3 mm.

ii) The fixings for joint assembly shall not fail under 1.3 kN load and shall fail before the load reaches 2.6 kN when applied over a length of 600 mm by means of a bar or timber packing placed as near to the level of the line of fixings as practicable.

iii) Fixings shall be deemed to fail when there is displacement of the assemblies by more than 3 mm with any form of fixing, under the test load. The displacement shall be measured at the nearest part of the assembly to the centre of the bar or timber packing.

Dowel bars in the contraction joints, construction joints and expansion joints shall be covered by a thin plastic sheath. The thickness of the sheath shall not exceed 0.5 mm and shall be tightly fitted on the bar for at least two-thirds of the length from one end for dowel bars in contraction/construction joints and half the length plus 50 mm for expansion joints. The sheathed bar shall comply with the following pull-out tests:

Four bars shall be taken at random from stock and without any special preparation shall be covered by sheaths as required in this Clause. The ends of the dowel bars which have been sheathed shall be cast centrally into concrete specimens 150 mm x 150 mm x 600 mm, made of the same mix proportions to be used in the pavement, but with a maximum nominal aggregate size of 20 mm and cured in accordance with IS:516. At 7 days a tensile load shall be applied to achieve a movement of

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the bar of at least 0.25 mm. The average bond stress to achieve this movement shall not be greater than 0.14 MPa.

For expansion joints, a closely fitting cap 100 mm long consisting of waterproofed cardboard or an approved synthetic material like PVC or Gl pipe shall be placed over the sheathed end of each dowel bar. An expansion space (about 25 mm) at least equal in length to the thickness.of the joint filler board shall be formed between the end of the cap and the end of the dowel bar by using compressible sponge. To block the entry of cement slurry into the annular space between the sheathing and dowel bar shall be taped around its mouth.

Tie Bars

Tie bars in longitudinal joints shall be deformed steel bars of strength 500 MPa complying with IS:1786 and in accordance with the requirements given in this Clause. The bars shall be free from oil, dirt, loose rust and scale.

Tie bars projecting across the longitudinal joint shall be protected from corrosion for 75 mm on each side of the joint by a protective coating of bituminous paint with the approval of the Engineer. The coating shall be dry when the tie bars are used. In the case of coastal region and high rainfall areas, tie bars shall be epoxy coated in their full length as per 13:13620.

Tie bars in longitudinal joints shall be made up into rigid assemblies with adequate supports and fixings to remain firmly in position during the construction of the slab. Alternatively, tie bars at longitudinal joints may be mechanically or manually inserted into the 1all plastic concrete from above by vibration using a method which ensures correct placements of the bars and re compaction of the concrete around the tie bars.

Tie bars shall be positioned to remain in the middle from the top or within the upper middle third of the slab depth as indicated in the drawings and approximately parallel to the surface and approximately perpendicular to the line of the joint, with the centre of each bar on the intended line of the joints within a tolerance of ±50 mm, and with a minimum cover of 30 mm below the joint groove. Spacing of tie bars on curves of radius less than 360 m shall not be Jess than 350 mm.

To check the position of the tie bars, one metre length, 0.5 m on either side of the longitudinal joint shall be opened when the concrete is green (within 20 to 30 minutes). The pit shall be refilled with the fresh concrete of same mix after checking.

Weather and Seasonal Limitations

Concreting during Monsoon Months

Concreting should be avoided during rainy season. However, when concrete is being placed during monsoon months and when it may be expected to rain, sufficient supply of tarpaulin or other waterproof cloth shall be provided along the line of the work. Any time when it rains, all freshly laid concrete which had not been covered for curing purposes shall be adequately protected. Any concrete damaged by rain shall be removed and replaced. If the damage is limited to texture, it shall be retextured in accordance with the directions of the Engineer.

Temperature Limitation

No concreting shall be done when the temperature of the concrete reaching the paving site is above 30°C. Besides, in adverse conditions like high temperature, low relative humidity, excessive wind velocity, imminence of rains etc., tents on mobile trusses may be provided over the freshly laid concrete for a minimum period of 3 hours as directed by the Engineer. To bring down the temperature, if necessary, chilled water or ice flakes should be made use of. When the ambient temperature is more than 35°C, no concreting shall be permitted. The ice flakes should not be manufactured from chlorinated water. Generally the rate of evaporation of water shall not exceed 1 kg/sqm/hour as per IRC:15.

No concreting shall be done when the concrete temperature is below 5°C and the temperature is further falling.

Fixed Form Paving

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Side Forms and Rails

These shall be provided in case of fixed form paving. All side forms shall be of mild steel of depth equal to the thickness of pavement or slightly less to accommodate the surface irregularity of the sub-base. The forms can be placed in series of steel packing plates or shims to take care of irregularity of sub-base. They shall be sufficiently robust and rigid to support the weight and pressure C?used by a paving equipment. Side forms for use with wheeled paving machines shall incorporate metal rails firmly fixed at a constant height below the top of the forms. The forms and rails shall be firmly secured in position by not less than 3 stakes/pins for every 3 m length so as to prevent movement in any direction. Forms and rails shall be straight within a tolerance of 3 mm in 3m and when in place shall not settle in excess of 1.5 mm in 3 m while paving is being done. Forms shall be cleaned and oiled immediately before each use. The forms shall be bedded on a continuous bed of low moisture content lean cement mortar or concrete and set to the line and levels shown on the drawings within tolerances ±10 mm and ±3 mm respectively. The bedding shall not extend under the slab and there shall be no vertical step between adjacent forms of more than 3 mm. The forms shall be got inspected by the Engineer for his approval 12 hours before construction of the slab and shall not be removed until at least 12 hours afterwards. No concreting shall commence till formwork has been approved by the Engineer.

At all times sufficient forms shall be used and set to the required alignment for at least 300 m length of pavement immediately in advance of the paving operations, or the anticipated length of pavement td be laid within the next 24 hours whichever is more.

Slip Form Paving

Use of Guidewires

Where slip form paving is proposed, a guidewire shall be provided along both sides of the slab. Each guidewire shall be at a constant height above and parallel to the required edges of the slab as described in the contract drawing within a vertical tolerance of ±3 mm. Additionally, one of the wires shall be kept at a constant horizontal distance from the required edge of the pavement as indicated in the contract drawing within a lateral tolerance of ±10 mm.

The guidewires shall be supported on stakes 5-6 m apart by connectors capable of fine horizontal and vertical adjustment. The guidewire shall be tensioned on the stakes so that a 500 gm we1ght shall produce a deflection of not more than 20 mm when suspended at the mid point between any pair of stakes. The ends of the guidewires shall be anchored to fixing point or winch and not on the stakes. On the curves, the stakes shall be fixed at not more than 3 m centre-to-centre.

The stakes shall be positioned and hammered into the ground and the connectors will be maintained at their correct height and alignment from 12 hours on the day before concreting takes place till after finishing of texturing and spraying of curing compound on the concrete.

However, the guidewire shall be erected and tensioned on the connectors at any section for at least 2 hours before concreting that section.

The Contractor shall submit to the Engineer for his approval of line and level, the stakes and connectors which are ready for use in the length of road to be constructed next day. Such approval shall be obtained atleast 12 hours before commencement of paving operation. Any deficiencies noted by the Engineer shall be rectified by the Contractor who shall then re-apply for approval of the affected stakes. Work shall not proceed until the Engineer has given his approval. It shall be ensured that the stakes and guidewires are not affected by the construction equipment when concreting is in progress.

Construction

General

A systems approach may be adopted for construction of the pavement, and the Method Statement for carrying out the work, detailing all the activities, indication of time-cycle, equipment, personnel etc.,shall be got approved from the Engineer before the commencement of the work. This shall include the type, capacity and make of the batching and mixing plant besides the hauling arrangement and

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paving equipment. The capacity of paving equipment, batching plant as well as all the ancillary equipment shall be adequate for a paving rate of atleast 500 m in one day. The paving speed of slip-form paver shall not be less than 1.0 m per minute. The concreting should proceed continuously without stops and starts.

Batching and Mixing

Batching and mixing of the concrete shall be done at a central batching and mixing plant with automatic controls, located at a suitable place which takes into account sufficient space for stockpiling of cement, aggregates and stationary water tanks. This shall be located at an approved distance, duly considering the properties of the mix and the transporting arrangements available with the Contractor.

Equipment for Proportioning of Materias and Paving

Proportioning of materials shall be done in the batching plant by weight, each type of material being weighed separately. The cement from the bulk stock may be weighed separately from the aggregates. Water shall be measured by volume. Specified percentage of plasticizer in volume will be added by weight of cement. Wherever properly graded aggregate of uniform quality cannot be maintained as envisaged in the mix design, the grading of aggregates shall be controlled by appropriate blending techniques. The capacity of batching and mixing plant shall be at least 25 percent higher than the proposed capacity of the laying/paving equipment.·

Batching Plant and Equipment :

1) General :The batching plant shall include minimum four bins, weighing hoppers, and scales for the fine aggregates and for each size of coarse aggregate. If cement is used in bulk, a separate scale for cement shall be included. There shall be a separate bin for flyash, if this additive is specified. The weighing hoppers shall be properly sealed and vented to preclude dust during operation. Approved safety devices shall be provided and maintained for the protection of all personnel engaged in plant operation, inspection and testing. The batch plant shall be equipped with a suitable non-resettable batch counter which will correctly indicate the number of batches proportioned. A continuous type of mixing plant can also be used provided the ingredients are weighed through electronic sensors before feeding.

2) Automatic weighing devices : Batching plant shall be equipped to proportion aggregates and bulk cement by means of automatic weighing devices using load cells. The weighing devices shall have an accuracy within ±1% in respect of quantity of cement, admixtures and water and ±2% in respect of aggregates and the accuracy shall be checked at least once a month.

3) Mixer : Mixers shall be pan type, reversible type or any other mixer capable of combining the aggregates, cement, and water into a thoroughly mixed and uniform mass within the specified mixing period, and of discharging the mix, without segregation. Each stationary mixer shall be equipped with an approved timing device which will automatically lock the discharge lever when the drum has been charged and release it at the end of the mixing period. The device shall be equipped with a bell or other suitable warning device adjusted to give a clearly audible signal each time the lock is released. In case of failure of the timing device, the mixer may be used for the balance of the day while itis being repaired, provided that each batch is mixed in 90 seconds or as per the manufacturer's recommendation. The mixer shall be equipped with a suitable non-resettable batch counter which shall correctly indicate the number of batches mixed.

The mixer shall be cleaned at suitable intervals. The pick-up and throw- over blades in the drum or drums shall be repaired or replaced when they are worn down 20 mm or more. The Contractor shall (1) have available at the job site a copy of the manufacturer's design, showing dimensions and arrangements of blades in reference to original height and depth, or (2) provide permanent marks on blade to show points of 20 mm wear from new conditions. Drilled holes of 5 mm diameter near each end and at midpoint of each blade are recommended. Batching Plant shall be calibrated in the beginning and thereafter at suitable interval not exceeding 1 month.

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4) Control cabin: An air-conditioned centralized computer control cabin shall be provided for automatic operation of the equipment.
5) The design features of the batching plant should be such that it can be shifted quickly.

Paving Equipment
The concrete shall be placed with an approved fixed form or slip form paver with independent units designed to (i) spread, (ii) consolidate, screed and float-finish, (iii) texture and cure the freshly placed concrete in one complete pass of the machine in such a manner that a minimum of hand finishing will be necessary and so as to provide a dense and homogeneous pavement in conformity with the plans and Specifications. The paver shall be equipped with electronic sensor controls to control the line and grade from either one side or both sides of the machine.

Vibrators shall operate at a frequency of 8000-10000 impulses per minute under load at a maximum spacing of 600 mm. The variable vibration setting shall be provided in the machine.

Concrete Saw
The Contractor shall provide adequate number of concrete saws with sufficient number of diamond-edge saw blades. The saw machine shall be either electric or petrol/diesel driven type. A water tank with flexible hose and pump shall be made available for this activity on priority basis. The Contractor shall have at least one standby saw in good working condition. The concreting work shall not commence if the saws are not in working condition.

Hauling and Placing of Concrete
Freshly mixed concrete from the central batching and mixing plant shall be transported to the paver site by means of tipping trucks or transit mixers of sufficient capacity and approved design in sufficient numbers to ensure a constant supply of concrete. Covers shall be used for protection of concrete against the weather. While loading the concrete truck shall be moved back and forth under the discharge chute to prevent segregation. The tipping trucks shall be capable of maintaining the mixed concrete in a homogeneous state and discharging the same without segregation and loss of cement slurry. The feeding to the paver is to be regulated in such a way that the paving is done in an uninterrupted manner with a uniform speed through the day's work. Tipping trucks shall be washed at a regular frequency as prescribed by the Engineer to ensure that no left-over mix of previous loading remains stuck.

Placing of Concrete
The total time taken from the addition of the water to the mix, until the completion of the surface finishing and texturing shall not exceed 120 minutes when concrete temperature is less than 25°C and 90 minutes when the concrete temperature is between 25°C and 30°C. When the time between mixing and laying exceed these values, the concrete shall be rejected and removed from the site. Tipping trucks delivering concrete shall normally not run on plastic sheathing nor shall they run on completed slabs until after 28 days of placing the concrete.

The placing of concrete in front of the PQC paver should preferably be from the side placer to avoid damage to DLC by concrete tipping trucks. In case of unavoidable situation, truck supplying concrete to the paver may be allowed to ply on the DLC with the approval of the Engineer. The paver shall be capable of paving the carriageway as shown in the drawings, in a single pass and lift.

Where fixed form pavers are to be used, forms shall be fixed in advance as per Clause. Before any paving is done, the site shall be shown to the Engineer, in order to verify the arrangement for paving besides placing of dowels, tie-bars etc., as per the relevant Clauses of these Specifications. The mixing and placing of concrete shall progress only at such a rate as to permit proper finishing, protecting and

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curing of the concrete in the pavement.

In areas inaccessible to paving equipment, the pavement shall be constructed using side forms, as per Clause.

In all cases, the temperature of the concrete shall be measured at the point of discharge from the delivery vehicle.

The addition of water to the surface of the concrete to facilitate the finishing operations will not be permitted except with the approval of the Engineer when it shall be applied as a mist by means of approved equipment.

If considered necessary by the Engineer, the paving machine shall be provided with approved covers. to protect the surface of the slab under construction from direct sunlight and rain or hot wind.

While the concrete is still plastic, its surface shall be textured by brush or tines as per the instructions of the engineer in compliance with Clause. The surface and edges of the slab shall be cured by the application of a sprayed liquid curing membrane in compliance with Clause. After the surface texturing, but before the curing compound is applied, the concrete slab shall be marked with the chainage at every 100 m interval by embossing.

As soon as the side forms are removed, edges of the slabs shall be corrected wherever irregularities have occurred by using fine concrete composed of 1:1:2, cement :sand : coarse agg (10 mm down) with water cement ratio not more than 0.4 .under the supervision of the Engineer.

If the requirement of Clause. for surface regularity fails to be achieved on two consecutive working days, then normal working shall cease until the cause of the excessive irregularity has been identified and remedied.

Construction by Slip Form Paver

The slip form paving train shall consist of a power machine which spreads, compacts and finishes the concrete in a continuous operation. The slip form paving machine shall compact the concrete by internal vibration and shape it between the side forms with either a conforming plate or by vibrating and oscillating finishing beams. The concrete shall be deposited without segregation in front of slip form paver across the whole width and to a height which at all times is in excess of the required surcharge. The deposited concrete shall be struck off to the necessary average and differential surcharge by means of the strike off plate or a screw auger device extending across the whole width of the slab. The equipment for striking-off the concrete shall be capable of being rapidly adjusted for changes of the average and differential surcharge necessitated by change in slab thickness or crossfall.

The level of the conforming plate and finishing beams shall be controlled automatically from the guide wires installed as per Clause by sensors attached at the four corners of the slip form paving machine. The alignment of the paver shall be controlled automatically from the guide wire by at least one set of sensors attached to the paver. The alignment and level of ancillary machines for finishing, texturing and curing of the concrete shall be automatically controlled relative to the guide wire or to the surface and edge of the slab.

Slip-form paving machines shall have vibrators of variable output, with a maximum energy output of not less than 2.5 KW per metre width of slab per 300 mm depth of slab for a laying speed upto 1.5 m per minute. The machines shall be of sufficient mass to provide adequate reaction during spreading

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and paving operations on the traction units to maintain forward movements during the placing of concrete in all situations. Normal paving speed shall be maintained as per Clause.

If the edges of the slip formed slab slump to the extent that the surface of the top edge of the slab does not comply with the requirements of Clause, the work shall be stopped until such time as the Contractor can demonstrate his ability to slip form the edges to the required levels. The deficient edge shall be temporarily supported by a side form and the thickness deficiency shall be made good by adding fresh concrete to the newly formed edge and compacting.

Slip-form pavers with adequate width to pave the entire carriageway width in one go shall be employed unless specified in the Contract. In situations where full-width paving is not possible, paving in part widths may be permitted by the Engineer. Paving in part will be avoided, except in unavoidable circumstances. In case of part width paving, care shall be taken to ensure that while laying the next lane, bond between the remaining half length of tie bar or subsequently inserted tie bars and the newly laid concrete is adequately developed. Care shall be taken to avoid damage to the previous lane.

In case paving in separate lanes is allowed, work on the adjacent lane shall be permitted when the previously paved lane is cured for at least 14 days and is in a position to bear the weight of paving machine. When the wheels or crawler tracks are to ply on the already paved surface, necessary precautions shall be taken by placing protective pads of rubber or similar material so that texture is not damaged. The wheel or track shall be reasonably away from the edge to avoid damage to the previously laid slab.

Tube Floating

Upon the instructions of the Engineer, Contractor shall scrape the concrete surface when in plastic state with a 3 m long tube float fixed with a long and stable handle before texturing. Tube float shall be of an alloy steel tube of 50 to 60 mm diameter with a long and stable handle. The length of tube float shall preferably be longer than half the length of slab i.e., half the distance between two transverse contraction joints. This operation shall be done to 6 minimise surface irregularity caused due to varied causes like frequent stoppages of work, surface deformation due to plastic flow etc. The tube float shall be placed at the centre of the slab parallel to longitudinal joint and pulled slowly and uniformly towards the edges. After the use of float tube, it shall be frequently cleaned before further use. The slurry removed shall be discarded. This activity shall be advanced laterally by providing an overlap of half of the length of tube float. The removal of the cement slurry from the surface shall be sufficient enough such that the texture is formed on a firm surface and is more durable. This operation, however, shall be carried out after removing bleeding water.

Construction by Fixed Form Paver

The fixed form paving train shall consist of separate powered machines which spread, compact and finish the concrete in a continuous operation.

The concrete shall be discharged without segregation into a hopper spreader which is equipped with means for controlling its rate of deposition on to the sub-base. The spreader shall be operated to strike off concrete upto a level requiring a small amount of cutting down by the distributor of the spreader. The distributor of spreader shall strike off the concrete to the surcharge adequate to ensure that the vibratory compactor thoroughly compacts the layer. If necessary, poker vibrators shall be used adjacent to the side forms and edges of the previously constructed slab. The vibratory compactor shall be set to strike off the surface slightly high so that it is cut down to the required level by the oscillating beam. The machine shall be capable of being rapidly adjusted for changes in average and differential surcharge necessitated by changes in slab thickness or crossfall. The final finisher shall be able to finish the surface to the required level and smoothness as specified, care being taken to avoid bringing up

of excessive mortar to the surface by over working.

Semi-mechanized Construction

Areas in which hand-guided methods of construction become indispensable shall be got approved by the Engineer in writing in advance. Such work may be permitted only in restricted the areas in small lengths. Work shall be carried out by skilled personnel as per methods approved by the Engineer. The acceptance criteria regarding level, thickness, surface regularity, texture, finish, strength, of concrete and all other quality control measures shall be the same as in the case of machine laid work. Guidelines on the use of plants, equipment, tools, hauling of mix, compaction floating, straight edging, texturing, edging etc. shall be as per IRC:15.

Transition Slabs

At the interface of rigid and flexible pavement, at least 3 m long reinforced buried slab shall be provided to give a long lasting joint at the interface. The details shall be as given in IRC:15.

Anchor Beam and Terminal Slab Beam Adjoining Bridge Structures

RCC anchor beams shall be provided in the terminal slab adjoining bridge structures as per drawings and IRC:15.

The Treatment of Concrete Pavement on Culverts

The concrete pavement shall be taken over the culverts. At both ends of the culvert slab, a contraction joint shall be provided in the concrete pavement. Nominal reinforcement of 1 0 mm dia bars at 150 mm spacing in both directions shall be provided at 50 mm below the top of the slab. The reinforcement shall be stopped 50 mm short of the contraction joint. Such reinforcement shall also be provided in the next slab panel on either side.

Surface Texture

Tining

After final floating and finishing of the slab and before application of the liquid curing membrane, the surface of concrete slabs shall be textured either in the transverse direction (i.e., at right angles to the longitudinal axis of the road) or in longitudinal direction (i.e., parallel to the centreline of the roadway). The texturing shall be done by tining the finished concrete surface by using rectangular steel tines. A beam or a bridge mounted with steel tines shall be equipped and operated with automatic sensing and control devices from main paver or auxiliary unit. The tining unit shall have facility for adjustment of the download pressure on the tines as necessary to produce the desired finish. The tining rakes shall be cleaned often to remove snots of slurry. The tines shall be inspected daily and all the damaged and bent tines s_hall be replaced before commencing texturing. Tined grooves shall be 3 mm wide and 3 to 4 mm deep. Before commencing texturing, the bleeding water, if any, shall be removed and texturing shall be done on a firm surface. The measurement of texture depth shall be done as per Clause.

a) Transverse tining : When the texturing is specified in transverse direction, a beam of at least 3 m length mounted with tines shall be moved in transverse direction to produce the texture. The grooves produced shall be at random spacing of grooves but uniform in width and depth. The spacing shall conform to a pattern shown below:

Random spacing in mm

10	14	16	11	10	13	15	16	11	10	21	13	10

The above pattern shall be repeated. Texturing shall be done at the right time such that the grooves after forming shall not close and they shall not get roughened. Swerving of groove patterns will not

be permitted. The completed textured surface shall be uniform in appearance.

b) Longitudinal tining : Longitudinal tining shall be done, if specified in the Contract. The texturing bridge shall be wide enough to cover the entire width of the carriageway but within 75 mm from the pavement edge. The centre to centre spacing between the tines shall be 18 to 21 mm. The width of tine texture shall be 3 mm and depth shall be 3 to 4mm.

Brush Texturing

Alternatively on the instructions of th Engineer, the brush texturing shall be applied. The brushed surface texture shall be applied evenly across the slab in one direction by the use of a wire brush not less than 450 mm wide but wider ?rushes normally of 3. m length are preferred. The brush shall be made of_32 gauge tape w1res grouped together m tufts placed at 1o mm centres. The tufts shall contam an average of 14 wires and initially be 100 mm long.

The brush shall have two rows of tufts. The rows shall be 20 mm apart and the tufts in one row shall be opposite the centre of the gap between tufts in the other row. The brush shall be replaced when the shortest tuft wears down to 90 mm long.

The texture depth shall be determined by the Sand Patch Test as described in the Clause. This test shall be performed at least once for each day's paving and wherever the Engineer considers it necessary at times after construction as under:

Five individual measurements of the texture depth shall be taken at least 2 m apart anywhere along a diagonal line across a lane width between points 50 m apart along the pavement. No measurement shall be taken within 300 mm of the longitudinal edges of a concrete slab constructed in one pass.

Texture depths shall not be less than the minimum required depth when measurements are taken as given in Table nor greater than an average of 1.25 mm.

Time of Test		Number of Measurements	Required Texture Depth (mm)	
			Specified Value	Tolerance
1)	Between 24 hours and 7 days after the construction of the slab or until the slab is first used by vehicles	An average of 5 measurements	1.00	±0.25
2)	Not later than 6 weeks before the road is opened to traffic	An average of 5 measurements	1.00	+0.25 -0.35

After the application of the brushed texture, the surface of the slab shall have a uniform appearance. Where the texture depth requirements are found to be deficient, the Contractor shall make good the texture across the full lane width over the length directed by the Engineer, by retexturing the hardened concrete surface in an approved manner.

Curing

Immediately after the surface texturing, the surface and sides of the slab shall be cured by the application of approved resin-based aluminized reflective curing compound Which hardens into an impervious film or membrane with the help of mechanical sprayer.

The curing compound shall not react chemically with the concrete and the film or membrane shall not crack, peel or disintegrate within three weeks of application. Immediately prior to use, the curing compound shall be thoroughly agitated in its containers. The rate of spread shall be in accordance with the manufacturer's instructions checked during the construction of the trial length and subsequently whenever required by the Engineer. The mechanical sprayer shall incorporate an efficient mechanical device for continuous agitation and mixing of the compound during spraying.

The curing compound shall be sprayed in two applications to ensure uniform spread.

Curing compounds shall contain sufficient flake aluminum in finely divided dispersion to produce a complete coverage of the sprayed surface with a metallic finish. The compound shall become stable and impervious to evaporation of water from the surface of the concrete within 60 minutes of application and shall be of approved type. The curing compounds shall have a water retention efficiency index not less than 90 percent in accordance with BS Specification No. 7542 or as per ASTM C-309-81 Type 2.

In addition to spraying of curing compound, the fresh concrete surface shall be protected for at least 3 hours by covering the finished concrete pavement with tents mounted on mobile trusses as described in Clause, during adverse weather conditions as directed by the Engineer. After three hours, the pavement shall be covered by moist laid in two layers and the same shall then be kept damp for a minimum period of 14 days after which time the hessian may be removed. The hessian shall be kept continuously moist. All damaged/torn hessian shall be removed and replaced by new hessian on a regular basis.

The Contractor shall be liable at his cost to replace any concrete damaged as a result of incomplete curing or cracked on a line other than that of a joint as per procedure in IRC:SP:83.

Preparation and Sealing of Joint Grooves
General
All joints shall be sealed using sealants described in Clause.

Preparation of Joint Grooves for Sealing

Grooves are saw cut in the first instance just to provide minimum width (3-5 mm) to facilitate development of crack at joint locations, as shown in the drawing.

Subsequently before sealing, grooves are widened by sawing as per the dimensions in the drawing. Dimension of the grooves shall be controlled by depth/width gauge.

If rough arrises develop when grooves are made, they shall be ground to prov1de chamfer approximately 5 mm wide. If the groove is at an angle upto 1 from the perpendicular to the surface, the overhanging edge of the groove shall be sawn or ground perpendicular. If spalling occurs or the angle of the former is greater than 10 degree, the joint sealing groove shall be sawn wider and perpendicular to the surface to encompass defects upto a maximum width, including _any chamfer, of 20 mm for transverse joints 1o mm for longitudinal joints. If the spalling cannot be so eliminated then the arises shall be repaired by an approved thin bonded arrises repair using cementitious/epoxy mortar materials.

All grooves shall be cleaned of any dirt or loose material by air blasting with filtered, oil-free compressed air. The Engineer shall instruct cleaning by pressurized water jets. Depending upon the requirement of the sealant manufacturer, the sides of the grooves shall be sand blasted to increase the bondage between sealant and concrete.

The groove shall be cleaned and dried at the time of priming and sealing. If sand blasting is recommended by the supplier, the same shall be carried out.

Before sealing the temporary seal provided for blocking the ingress of dirt, soil etc., shall be removed. A highly compressible heat resistant paper-backed debonding be strip as per drawing shall be

inserted in the groove to serve the purpose of breaking the bond between sealant and the bottom of the groove and to plug the joint groove so that the as sealant may not leak through the cracks. The width of debonding strip shall be more than the an joint groove width so that it is held tightly in the groove. In the case of longitudinal joints, heater resistant tapes may be inserted to block the leakage through bottom of the joint where hot All poured sealant is used. When cold poured sealant is used a debonding tape of 1.0-2.0 mm thickness and 6 to 8 mm width shall be inserted to plug the groove so that the sealant does not enter in the initially cut groove.

Sealing with Sealants

When sealants are applied, an appropriate primer shall also be used if recommended by the manufacturer and it shall be applied in accordance with his instructions. The sealant shall be applied within the minimum and maximum drying times of the primer recommended by the manufacturer. Priming and sealing with applied sealants shall not be carried out when the naturally occurring temperature in the joint groove to be sealed, is below 7°C.

If hot applied sealant is used it shall be heated and applied from a thermostatically controlled, indirectly heated preferably with oil jacketed melter and pourer having recirculating pump and extruder. For large road projects, sealant shall be applied with extruder having flexible hose and nozzle. The sealant shall not be heated to·a temperature higher than the safe heating temperature and not for a period longer than the safe heating period, as specified by the manufacturer. The dispenser shall be cleaned out at the end of each day in accordance with the manufacturer's recommendations and reheated material shall not be used. The Movement Accommodation Factor of the sealant shall be more than 10 percent.

Cold applied sealants with chemical formulation like polysulphide/ Polyurethene/ silicone as per IRC:57 shall be used These shall be mixed and applied within the time limit specified by the manufacturer. If primers are recommended they shall be applied neatly with an appropriate brush. The Movement Accommodation Factor shall be more than 25 percent.

The sealants applied at contraction phase of the slabs would result in bulging of the sealant over and above the slab. Therefore, the Contractor in consultation with the Engineer, shall establish the right temperature and time for applying the sealant. Thermometer shall be hung on a pole at the site for facilitating control during the sealing operation

Sealant shall be applied, slightly to a lower level than the slab with a tolerance 3±1mm.

During sealing operation, it shall be seen that no air bubbles are introduced in the sealant either by vapours or by the sealing process. The sealant after pouring, shall be allowed to cure for 7 days or for a period as per instructions of manufacturers.

Trial Length

The trial shall be constructed at least one month in advance of the proposed start of concrete paving work. At least one month prior to the construction of the trial length, the Contractor shall submit for the Engineer's approval a detailed method statement giving description of the proposed materials, plant, equipment and construction methods. All the major equipment like paving train, batching plant, tipping trucks etc., proposed in the construction are to be approved by the Engineer before their procurement. No trials of new materials, plant, equipment or construction methods, nor any development of them shall be permitted either during the construction of trial length or in any subsequent paving work, unless they form part of further trials. The trial lengths shall be constructed away from the carriageway.

The Contractor shall demonstrate the materials, plant, equipment and methods of construction that are proposed for concrete paving, by first constructing a trial length of slab, at least 100 m long

for mechanized construction and at least 50 m long for hand guided methods. The width of the trial section shall be the full carriageway width as shown in the drawings. If the first trial is unsatisfactory, the Contractor shall have to demonstrate his capability to satisfactorily construct the pavement in subsequent trials.

The trial length shall be constructed in two parts over a period comprising at least part of two separate working days, with a minimum of 50 m constructed each day for mechanised construction and a minimum of 25 m on each day for hand guided construction. The trial length shall be constructed at a paving rate which is proposed for the main work.

Transverse joints including expansion joint and longitudinal joint that are proposed in the main work shall be constructed and assessed in the trial length.
The trial length shall comply with the Specifications in all respects including the test requirement of Table with the following additions.

Surface Levels and Regularity

a) In checking for compliance with Clause the levels shall be taken at intervals at the locations specified in this Clause along any line or lines parallel to the longitudinal centre line of the trial length.
b) The maximum number of permitted irregularities of pavement surface shall comply with the requirements of Clause. Shorter trial lengths shall be assessed pro-rata based on values for a 300 m length.

Joints

a) Alignment of dowel bars shall be inspected in any two consecutive transverse joints in a trial length construction by removing the fresh concrete in a width of 0.5 m on either side of the joint. The joint pit shall be refilled with freshly prepared concrete, after inspection. Alternatively, it can be tested by suitable device like MIT SCAN with the permission of the Engineer. If the position or alignment of the dowel bars at one of these joints does not comply with the requirements and if that joint remains the only one that does not comply after the next 3 consecutive joints of the same type have been inspected, then the method of placing dowels shall be deemed to be satisfactory. In order to check sufficient joints for dowel bar alignment without extending the trial length unduly joints may be constructed at more frequent joint intervals than the normal spacing required in trial slabs.
b) If there are deficiencies in the first expansion joint that is constructed as a trial, the next expansion joint shall be a trial joint. Should this also be deficient, further trial of expansion joints shall be made as part of the trial length which shall not form part of the permanent works, unless agreed by the Engineer.

Density

In-situ density in trial length shall be assessed as described in Clause from at least 3 cores drilled from each part of the trial length when the concrete is not less than 7 days old. Should any of the cores show honey-combing in the concrete, the trail length shall be rejected and the construction in the main carriageway shall not be permitted until further trials for have shown that modification has been made which would result in adequate compaction.

Strength

Minimum of thirty (30) beams for flexural strength and thirty (30) cubes for compressive strength shall be prepared from the concrete delivered in front of the paving plant. Each pair of beams and cubes shall be from the same location/batch but different sets of beams and cubes shall be from different locations/batches. Compressive and flexural strength shall be tested after 28 days water curing in the laboratory.

At the age of 28 days, thirty (30) cores with diameter 150 mm shall be cut from the pavement slab when the thickness of concrete pavement is more than 300 mm. In case the concrete pavement thickness is less than 300 mm, the dia of core shall be 100 mm. The cores shall be suitably cut at both ends to provide a specimen of plain surface on both ends. The dia to height ratio of core shall be 1 to 2. For cylindrical specimen of PQC of dia 150 mm, the variation in dia shall be ± 0.5 mm, a tolerance on height shall be ± 1 mm for a specimen of height 300 mm or more. For cylindrical specimen of dia 100 mm, the variation in dia shall be ± 0.3 mm, and a tolerance on height shall be ±1 mm for a specimen height of 200 mm. The compressive strength test shall be conducted as per IS:516.

Concrete in the member represented by a core test shall be considered acceptable, if the average equivalent cube strength of the cores is equal to at least 85 percent of the cube strength (characteristic strength) of the.grade of the concrete specified for the corresponding age of 28 days and no individual core has a strength less than 75 percent.

Approval and Acceptance

Approval of the materials, plant, equipment and construction methods shall be given when the trial length complies with the Specifications. The Contractor shall not proceed with normal working until the trial length has been approved. If the Engineer does not notify the Contractor of any deficiencies in any trial length within 7 days after the completion of that trial length, the Contractor may assume that the trial length, and the materials, plant, equipment and construction methods adopted are acceptable, provided that the 28 days strength of cubes and cores extracted from trial length meet the requirement of the Specified strength.

When approval has been given, the materials, plant, equipment and construction methods shall not thereafter be changed, except for normal adjustments and maintenance of plant, without the approval of the Engineer. Any changes in materials, plant, equipment, and construction methods shall entitle the Engineer to require the Contractor to lay a further trial length as described in this Clause to demonstrate that the changes will not adversely affect the permanent works.

Trial lengths which do not comply with the Specifications, with the exception of areas which are deficient only in surface texture and which can be remedied in accordance with Clause shall be removed immediately upon notification of deficiencies by the Engineer and the Contractor shall construct a further trial length.

Inspection of Dowel Bars

Compliance with Clause for the position and alignment of dowel bars at contraction and expansion joints shall be checked by measurements relative to the side forms or guide wires.

When the slab has been constructed, the position and alignment of dowel bars and any filler board shall be measured after carefully exposing them in the plastic concrete across the whole width of the slab. the joint is an expansion joint, the top of the filler board shall be exposed sufficiently 1n the plastic concrete to permit measurement of any lateral or vertical displacement of the board. During the course of normal working, these measurements shall be carried out in the pavement section at the end of days work by extending slab length by 2 m. After sawing the transverse joint groove, the extended 2 m slab shall be removed carefully soon after concrete has set to expose dowels over half the length. These dowels can be tested for tolerances. This joint shall be treated as construction joint. The position of dowel bars in any type of transverse joint ie, contraction, construction or expansion can alternatively be tested by suitable device like MIT SCAN with the permission of the Engineer.

If the position and alignment of the bars in a single joint in the slab is unsatisfactory then the next two joints shall be inspected. If only one joint of the three is defective, the rate of checking shall be increased to one joint per day until the Engineer is satisfied that compliance is being achieved.

After the dowel bars have been examined, the remainder of the concrete It shall be removed over a

width of 500 mm on each side of the line of the joint and reinstated It to the satisfaction of the Engineer. The dowels shall be inserted on both sides of the 1 m wide slab by drilling holes and grouting with epoxy mortar. Plastic sheath as per Clause shall be provided on dowels on one of the joints. The joint groove shall be widened and sealed as per Clause.

Inspection of Tie Bars

To check the position of the tie bars, one metre length 0.5 m on either side of the longitudinal joint shall be opened when the concrete is green (within 20 to 30 minutes of its laying). The pit shall be refilled with the fresh concrete of same mix after checking.

Measurement of Texture Depth - Sand Patch Method

The following Apparatus shall be used:

i) A cylindrical container of 25 ml internal capacity;

ii) A flat wooden disc 64 mm diameter with a hard rubber disc, 1.5 mm thick, next to one face, the reverse face being provided with a handle;

iii) Dry natural sand with a rounded particle shape passing a 300 micron IS sieve and retained on a 150 micron IS sieve.

Method

The surface to be measured shall be dried, any extraneous mortar and loose material removed and the surface swept clean using a wire brush both at right angles and parallel to the carriageway. The cylindrical container shall be filled with the sand, tapping the base 3 times on the surface to ensure compaction, and striking off the sand level with the top of the cylinder. The sand shall be poured into a heap on the surface to be treated. The sand shall be spread over the surface, working the disc with its face kept flat in a circular motion so that the sand is spread into a circular patch with the surface depressions filled with sand to the level of peaks.

The diameter of the patch shall be measured to the nearest 5 mm. The texture depth of concrete surface shall be calculated from 31000/(DxD) mm where Dis the diameter of the patch in mm.

Measurement of Texture Depth - Tining

The following apparatus shall be used :

i) Tire Tread Depth Gauge

A stainless steel tire tread depth gauge with graduations with least count of 1.0 mm. The gauge end may be modified to measure depth of tine texture.

ii) A stainless steel caliper to measure spacing of tines. If necessary the caliper may be modified to measure the spacing and width of tine texture. The guage shall be used after making necessary calibration.

iii) Wire brush

iv) Carborundum stone

iv) Steel straight edge to remove snots etc. sticking to the surface. The straight edge may be of 6 x 25 x 300 mm size.

Test Section

A unit of testing shall be 75 m per lane. If the length of construction is less than 75 m it shall be taken as one unit.

Test Procedure

In each 75 m section, along the diagonal line, 10 points shall be selected for making checks of depth, width and spacing of tine grooves. The surface where tests are to be conducted shall be cleared carefully with a wire brush or a steel straight edge or using a carborundum plate to remove any upward projection of concrete. When the base plate of the gauge is in contact with the concrete

surface, the gauge shall be pressed to the bottom of groove and the depth shall be measured and recorded at this location. At the same location, the spacing of tines shall be measured to verify whether the pattern recommended in Clause is complied or not.
The average of depth and width at 10 locations shall be calculated and recorded to the nearest 1 mm. The spacing of spectrum measured at 10 locations shall be recorded separately.
The average depth shall be 3 to 4 mm. When the depth is Jess than 2.5 mm and in excess of 4.5 mm, the Contractor shall stop concreting till he corrects his tine brush or replaces it. The sensors associated with work shall be again calibrated to achieve the required texture. The textured groove less than 2.5 mm shall be re-grooved using concrete saw at the cost of Contractor. Variation in texture width in the range of 3+1 mm and 3-0.5 mm will be acceptable. If the variation of width is in excess of this range, the Contractor shall stop work and correct the brush and technique. When the spacing of spectrum is not satisfactory, the Contractor shall replace the entire brush.

Opening to Traffic

No vehicular traffic shall be allowed to ply on the finished surface of a concrete pavement within a period of 28 days of its construction and until the joints are permanently sealed and cured. The road may be opened to regular traffic after completion of the curing period of 28 days and after sealing of joints is completed including the construction of shoulder, with the written permission of the Engineer.

Acceptance Criteria in Quality and Distress

i) Tolerances for Surface Regularity, Level, Thickness and Strength: The tolerances for surface regularity, level, thickness and strength shall conform to the requirements given in Clause. Control of quality of materials and works shall be exercised by the Engineer.
ii) Tolerances in Distress : The acceptance criteria with regard to the types of distresses in rigid pavement shall be as per IRC:SP-83. "Guidelines for Maintenance, Repair and Rehabilitation of Cement Concrete Pavements". The cracks (of severity rating not more than 2) which may appear during construction or before completion of Defect Liability Period shall be acceptable with suggested treatments as given in IRC:SP-83.
Cement Concrete Pavement slabs having cracks of severity rating more than 2 i.e. cracks of width more than 0.5 mm for single discrete cracks, multiple and transverse cracks and cracks of width more than 3 mm in case of longitudinal cracks and of depth more than half of the concrete pavement slabs, shall be removed and replaced as per IRC:SP-83.

Measurements for Payment

Cement Concrete pavement shall be measured as a finished work in cubic metres of concrete placed based on the net plan area and thickness as measured in accordance with Clause.
The finished thickness of concrete for payment on volume basis shall be computed in the manner described in Clause with the following modifications:
i) The levels shall be taken before and after construction at grid points 5 m centre to centre longitudinally in straight as well as at curves
A day's work is considered as a 'lot' for calculating the average thickness of the slab. In calculating the average thickness, individual measurements which are in excess of the specified thickness by more than 10 mm shall be considered as the specified thickness plus 10 mm.
Individual areas deficient by more than 10 mm shall be verified by the Engineer by ordering core cutting and if in his opinion the deficient areas warrant removal, they shall be removed and replaced with concrete of the thickness shown on the plans.

Payment

The Contract unit rate for the construction of the cement concrete pavement shall be payment in full for carrying out the operations required for the different items of the work as per these Specifications

including full compensation for all labour, tools, plant, equipment, providing all materials i.e. aggregates, dowel bars, tie bars, PVC membrane, cement, stabilizers (lime, cements or any other stabilizers approved by the Engineer), storing, mixing, transportation, placing, compacting, finishing, curing, testing, all royalties, fees, rents where necessary, all leads and lifts and incidentals to complete the work as per Specifications.

The unit rate shall all include the full costs of construction, expansion, contraction and longitudinal joints including joint filler, sealant, primer, debonding strip and all other operations for completing the work. The construction and testing of trial length shall be included in the contract unit rate for the pavement and shall not be paid separately.

Where the average thickness for the lot is deficient by the extent shown in Table, payment for cement concrete pavement shall be made at a price determined by adjusting the contract unit price as per Table.

Table : Payment Adjustment for Deficiency in Thickness

Deficiency in the Average Thickness of Day's Work	Percent of Contract Unit Price Payable
Up to 5 mm	100
6-10 mm	87

No additional payment shall be made for the extra thickness of the slab than shown on the drawings.

Section 1400 – Kerbs and Footpaths

Add new Clause 1402A "HAND PACK STONE SOILING" after Clause 1402 as follows:

1402A Hand Pack Stone Soiling

Materials

Stone: The stone shall be hard and free from impurities.

Laying and Compaction

The stone shall be laid in flat and sand shall be spread over the stone completed to the required depth after sprinkling water. Each layer of the stone shall be so laid that the final completed depth after sand blinding and watering shall not exceed 200mm. The compaction shall be carried out either manually or mechanically to the satisfaction of the Supervision Team.

Measurement: The measurement shall be in cubic meter of complete finish work.

Payment: The quantities of hand pack stone soiling measured as provided above shall be paid at the contract unit rate which shall be the full and final compensation to the Contractor as per Clause 112.

Add new "Clause 1406: Precast Concrete Property Access Slabs" after "Clause 1405: Cycle Tracks" as follows:

1406 Precast Concrete Property Access Slabs

The Contractor shall provide and install precast concrete slabs in accordance with the detail shown in the drawings to permit access across lined and unlined side drains wherever directed by the Engineer.

The materials and workmanship used in the fabrication of these slabs shall be entirely in accordance with the requirements of the relevant Clauses of this Specification governing concrete, reinforcement and formwork. Formwork for the slabs shall be such as to provide a class F3 finish throughout.

The measurement of precast concrete property access slabs shall be in numbers of each type of slab fabricated, transported and placed in accordance with the Drawings and these Specifications.

The quantities measured as provided above shall be paid at the respective contract unit rates for each type of slab. The contract unit rates shall be the full and the final compensation to the Contractor for installation where and as directed and shall include for fabrication of the slabs including the concrete of specified grade, reinforcement and form works, transport to the location for installation, any necessary trimming and bedding and placing of the slabs in their final position.

Add new "Clause 1407: Precast Reinforced Cement Concrete (RCC) Covered Drain" after "Clause 1406: Precast Concrete Property Access Slabs" as follows:

1407 Precast Reinforced Cement Concrete (RCC) Covered Drain

The Contractor shall provide and install precast Reinforced Cement Concrete(RCC)covered drains in accordance with the details shown in the drawings along the road side wherever directed by the Engineer.

The materials and workmanship used in the fabrication of RCC covered drain shall be entirely in accordance with the requirements of the relevant Clauses of this Specification governing concrete, reinforcement and formwork. Formwork for works shall be such as to provide a class F3 finish throughout.

The measurement of precast Reinforced Cement Concrete (RCC) covered drains shall be in meter of each type of RCC covered drain fabricated, transported and placed in accordance with the Drawings and these Specifications.

The quantities measured shall be paid at the respective contract unit rates for each type of Reinforced Cement Concrete (RCC) covered drains. The contract unit rates shall be the full and final compensation to the Contractor for installation where and as directed and shall include for fabrication of the Reinforced Cement Concrete (RCC) covered drains including the concrete of specified grade, reinforcement and form works, transport to the location for installation, any necessary trimming, bedding and placing in their final position, use of cement sand mortar at joints etc to meet the requirements of the drawings and these Specifications and to the satisfaction of the Engineer.

Add new "Clause 1408 Multi Blended Interlocking Concrete Block for Footpath:" after "Clause 1407: Precast Reinforced Cement Concrete (RCC) Covered Drain" as follows:

1408 Multi Blended Interlocking Concrete Block for Footpath

(1) General

Multi Blended Interlocking Concrete Block Pavements shall be used in footpaths for the pedestrians or as per the instruction of the Engineer. Laying of the blocks shall be done, precisely at the indicated level and profile. The blocks shall be laid to the pattern as shown in the drawings or as directed by the Engineer. The blocks shall be laid as tight as possible to each other. The maximum joint width shall be limited to 4 mm. Fine angular sand as per specification shall be brushed into the joints, and thereafter compaction shall be done with a vibrating plate compactor on a clean surface.

(2) Design Parameters

(a) Block Thickness

The thickness of interlocking blocks shall be 60 mm. The blocks shall be constructed with M 25/20 grade concrete and shall confirm Nepal Standard. All blocks should be of the same thickness, with a maximum allowable tolerance limit of±3 mm.

(b) Sand Bedding and Jointing

A layer of stone dust /fine sand bedding is provided between block pavement and compacted base with granular sub-base material to provide a cushion between the hard base and the paving blocks and to correct the permitted surface unevenness of sub-base.

The stone dust /fine sand bed should not be too thick lest it would be difficult to control the surface level of the blocks. A layer thickness of 50 mm is found to be satisfactory. The stone dust /fine sand used should be free from plastic clay and should be angular type.

Joints between blocks are filled by stone dust /fine sand. Normally, the bottom 20 to 30 mm of the joint gets filled with bedding sand, whereas, the remainder space has to be filled with jointing sand by brooming it from the top. The joints are normally 2 to 4 mm wide.

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(c) Base Construction

This layer is the important structural layer of a block pavement. The material used for base construction consists of granular sub-base material meeting the standard of Clause 1201 of 75 mm thickness.

(3) Construction

(a) General

The construction of interlocking concrete block involves preparation of sub-grade and sub-base layers, bedding sand and finally the laying of blocks. The block paving can be done entirely by manual labour. However, for efficient construction work, the work force has to be properly trained for this specialized job.

(b) Preparation of Sub-grade

Sub-grade should be compacted in layers of 150 mm to 200 mm thickness as per the use of compaction equipment. The prepared sub-grade should be graded and trimmed to a tolerance of ± 20 mm of the design level.

(c) Sub-base Course

The granular sub-base course shall be constructed following the section 1201 of this Specification.

(d) Placing and Screening of Bedding Sand

The thickness of the sand bed after compaction should be in the range of 20 - 40 mm, whereas, in the loose form it can be 25 to 50 mm. Bedding sand should not be used to fill-up local depressions on the surface of a sub-base layer. The depressions should be repaired in advance before placing sand. Sand to be used should be uniformly in loose condition and should have uniform moisture content. Best moisture content is between 6 to 8 percent.

The processed sand is spread to the required thickness. The sand is subsequently compacted with plate vibrators weighing 0.6 tonnes or more.

(e) Laying of Blocks

Blocks can be laid generally by manual labour.

As far as possible, laying should proceed in one direction only, along the entire width of the area to be paved.

While locating the starting line, the following should be considered:

- In case of irregular shaped edge restraints or strip, it is better to start from straight sting line.
- Influence of alignment of edge restraints on achieving and maintaining laying bond.

(4) Measurement and Payment

The measurement and payment of the interlocking concrete block shall be made in Square meter. Payment made at the contract unit rate for interlocking concrete block shall be payment

in full compensation for furnishing all labour, material, tools, equipment at site conforming to the Specifications section 112 and as per approved drawings or as directed by the Engineer.

The subbase laid under the stone dust shall be measured in cubic meter and shall be paid under the respective item in the BoQ.

Add new "Clause 1409 Catch pit for rain water" after "Clause 1408: Multi Blended Interlocking Concrete Block for Footpath" as follows:

1409 Catch Pit for Rain water

Catch Pit shall be used for collection of surface water during rainy period. The contractor shall construct the same catch pit as per drawing. Materials used in construction of catch pit shall confirm these specification clauses.

The measurement and payment of the Catch Pit shall be made in number. Payment made at the contract unit rate for Catch pit shall be payment in full compensation for furnishing all labour, material, tools, equipment including all incidental costs necessary for carrying out the works at site conforming to the Specifications as per approved drawings or as directed by the Engineer.

Section 1500 – Traffic Signs, Road Marking, Road Marker Stones and Delineators

Add General Requirement before "Clause1501-Permanent Traffic Sign"

General Requirements

This Clause covers the changes in the requirements to be met by the Contractor in relation to the installation of permanent traffic signs, road markings and various other traffic control devices as provided in the schedule of quantities (BOQ). Construction drawings issued with the contract document contain standard layout plan of traffic signs, road pavement marking and other ancillary traffic control devices. Their locations in the plan, where applicable, are indicative only.

The contractor shall prepare the detailed layout plans showing all traffic signs (cautionary, regulatory and informatory) and pavement parking and other road safety items and submit to the Engineer for approval 21 days prior to the commencement of their installation. The layout plan will be prepared in detail based on the guidelines / templates provided by the Engineer. The plans shall include but are not limited to the following elements of traffic control and safety management:

i. Traffic signs (cautionary, regulatory, informatory) including speed limit signs;
ii. Pavement marking / painting including all longitudinal and transverse lines (RRPM included);
iii. Transverse and longitudinal rumble strips;
iv. Other traffic calming measures such as raised platforms;
v. Pedestrian crossing facilities (at mid-blocks as well as at intersections zebra/ signalized, wombat);
vi. Lane control signs, Variable Speed Limit Signs including with gantry girders where required/ shown in the construction plan or as instructed by the Engineer;
vii. Traffic signals (at intersections and at mid-blocks)
viii. Roadside barriers (with types and length), hazard markers; and
ix. Any other traffic control devices and / or road safety measures shown in the BOQ or in the construction drawings.

All traffic signs shall comply and layout requirements shall be in accordance with the Nepal Traffic Sign Manual (NTSM). In cases where the provisions are not described in the NTSM, other international practices such as IRC or AGTM's recommendations will be used.

1501 Permanent Traffic Signs

(2) Materials

(a) Mounting Post

In first line delete: "either 50mm internal diameter steel tube of "heavy" category or"

(11) Payment

Add the following additional paragraph at the end of this Sub-clause:

"The Bills of Quantities provide for two classes of sign for payment purposes:

i. Single post

ii. Double or more posts

All signs supported by a single post shall be classed as "single post"

"All signs supported by two or more posts shall be classified as "double post or more posts".

1506 Road Marker Stone

(3) Construction (b) Placing and Painting of Marker Stones

Insert the following additional paragraph at the end of this Sub-clause:

The concrete bedding for marker stones shall have a minimum volume below ground level of 0.25 cu.m. for 5th kilometer marker stones and of 0.125 cu.m. for standard marker stones. In addition, the actual volume of concrete used shall be sufficient to ensure the secured and permanent bedding of the marker stones in position to the satisfaction of the Engineer having due regard to the soil and slope conditions and to the size of the initial excavation. Excavation for foundation pits for marker stones shall be wholly backfilled with concrete including the backfilling of any over excavation which may have taken place.

Insert the following additional Sub Clause (3c) "Reflectorized Enamel Painting Works"after Sub-clause (3b):

(3c) Reflectorized Enamel Painting Works

This Clause covers the enamel painting works of safety and/or warning barrier with black or yellow paint as indicated on the Drawing or instructed by the Engineer.

The colour, width and layout of the painting on safety and/or warning barrier shall be in accordance with the Traffic Signs Manual (latest publication), Department of Roads.

Paint shall comply with the requirements of NS 408/054 or BS 6044 (1987) or as specified in the Contract. If specified in the contract, the paint may also be reflectorised paint, in which case the paint shall be reflectorised by the addition of reflecting beads (balloting). The balloting shall comply with BS 6088:1981 (1993).

The paint shall be delivered to the site in sealed containers bearing the name of the manufacturer and the type of paint.

The viscosity of the paint shall be such that it can be applied without thinning. Under no circumstance thinning shall be allowed.

The paint shall not be applied to damp surfaces or when the relative humidity exceeds 80%, or at temperatures lower than 10o C, or when, in the opinion of the Engineer, wind strength is such that it may adversely affect the painting operations.

Before the paint is applied, the surface shall be clean and dry and completely free form any soil grease, oil, acid or any other material which shall be detrimental to the bond between the paint and the

surface. The portions of the surface where the paint is to be applied shall be properly cleaned by means of watering, brooming or compressed air.

If any material not complying with the requirement is delivered on the site or used in the works, or if any sub-standard work is carried out, such material or work shall be removed, replaced or repaired as required by the Engineer at the Contractor's own cost. Rejected paint which has been splashed or dripped on the surfacing, kerbs, structures or other such surfaces, shall be removed by the Contractor at his own cost, in such a way that the marking or split paint shall not show up again later. After the application of paint, it shall be protected against damage by traffic or other causes. The Contractor is responsible at his own cost for the correction of the painting works damaged by the external means.

1507 Delineator Posts

(4) Erection and Painting

Delete last sentence of first paragraph and substitute with

"Delineator Posts shall be bedded into ground with concrete foundation of grade M10/40 as shown on the drawings".

1511 Steel Crash Barrier

(1) Scope

Add the following at the first paragraph after "W-Beam":

", thrie beam and W-Beam with under-run"

Add the following at the beginning of the second paragraph after "W-Beam":

", thrie beam and W-Beam with under-run"

(2) Material

Add the following at the beginning of the first paragraph after "corrugated":

"or plain"

(C) Technical Specification for Steel Crash Barrier and Accessories

Replace "IRC 5-1988" cm by "IRC 119-2015" *at end of the first paragraph*

Add the following at the end of the first paragraph:

"However, at the connection part between RCC Crash Barrier and W-Beam or Thrie Beam or vice versa the spacing of the vertical post shall be as per drawing closer than 2 m"

Replace 85 cm by 80 cm *in second paragraph*

Add the following after second paragraph after:

"The W-Beam with under-run safety barrier shall have post and spacer similar to ones mentioned above for W-Beam type. The rail shall be placed at 70 cm above the ground level. The under-run beam shall be placed in between the ground level and W-Beam."

Add the following at the beginning of the third paragraph after "thrie beam":

"W-Beam with under-run"

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On the table S.No. 2 and 3 and, Requirement column add after "length of post 1800mm":

"for W-Beam, 2100 mm for thrie Beam and 1800mm for W-beam with under-run"

and

add after "Length of spacer-330 mm",

"for W-Beam, 546 mm for thrie Beam and 330 mm for W-beam with under-run"

(d) Packing of Steel W-Beam Crash Barrier and Accessories

Add the following at the beginning of the second paragraph after "W-Beam":

", thrie beam and W-Beam with under-run"

Add followings new Clauses after "1511 Steel Crash Barrier":
1512 Yellow Metal Reflector on concrete crash barrier
1513 Reflector on Galvanized Metal Beam Crash Barrier
1514 Median Marker
1515 Precast New Jersey Barriers
1516 Solar Street Lighting Systems
1517 Tubular Steel Pole
1518 Relocation/Re-erection of Electrical Works
1519 Bus Stop Shelter
1520 Traffic Signal
1521 Edge Rumble Strips

1512 Yellow Metal Reflector on Concrete Crash Barrier

Supply and Fixing of Metal Reflector which shall be made of tough, high impact resistant, injection-molded, thermoplastic body with U shape structure with overall height of minimum 180mm and shank depth of minimum 30mm and thickness not less than 2mm. The exposed body structure should be cornered rounded for better aesthetics. The plastic used for the molding the flexible median marker shall have a minimum notched Izod Impact strength value of 4.11 J/cm (@thickness 3.17mm) at room temperature, tested in accordance with ASTM D256. The outer part of the body shall have the Abrasion loss not less than 35mm3 when tested accordance with DIN 53505 and DIN535516 respectively and shall retain at least 70% of this value when it is subjected to accelerated weathering for 500hrs as per ASTM G155 standard. The logo of the manufacture shall be embossed on either side of the body in the injection molding process. The flexible median marker shall have U shaped florescent sheeting should confirm to Type XI Florescent Yellow sheeting as per IRC 67 and ASTM D4956-11. The product design has to with stand all natural impacts and should not get damaged if any pedestrian stamp on top of it intentionally and unintentionally. The product should bend upto 90 degree on both sides (becoming completely horizontal). It should be able to take minimum 200 stamping without any grouting/drilling as per Engineer in Charge.

Measurements for Payment
Metal Reflector shall be measured as a finished work in numbers.

Payment
The Contract unit rate for the supply and fixing shall be payment in full for carrying out the work as per these Specifications.

1513 Reflector on Galvanized Metal Beam Crash Barrier

Reflectors are used to increase the visibility of guardrails. They are produced from galvanized metal sheets coated with prismatic high-intensity (Type-4) reflective sheets. ONE-FACED double wave metal barrier reflector with catdioptric, hot-galvanized steel sheet metal support AMBER color.

Reflector for fixation in metal barrier. Type R2 Class 2 according to standard EN 12899-3 with catadioptric plates in optical Polycarbonate with high scratch hardress. New retro-reflectors in good condition have a retro-reflection higher than that of Class 3 (D.G.) film of the best brands.

It is fixing in metallic support in hot-dip galvanized steel with high resistance to environmental corrosion and saline environment.

The typical dimension and weight of the reflector is having Base 120mm x width 70mm, Reflective surface 54cm2 and weight set for One face 113gm; Two faces 252gm.

Measurements for Payment
Metal Reflector shall be measured as a finished work in numbers.

Payment
The Contract unit rate for the supply and fixing shall be payment in full for carrying out the work as per these Specifications.

1514 Median Marker

Supply and Fixing of Flexible Median Marker which shall be made of tough, high impact resistant, injection-molded, thermoplastic body with U shape structure with overall height of minimum 180mm and shank depth of minimum 30mm and thickness not less than 2mm. The exposed body structure should be cornered rounded for better aesthetics. The plastic used for the molding the flexible median marker shall have a minimum notched Izod Impact strength value of 4.11 J/cm (@thickness 3.17mm) at room temperature, tested in accordance with ASTM D256. The outer part of the body shall have the Abrasion loss not less than 35mm3 when tested accordance with DIN 53505 and DIN535516 respectively and shall retain at least 70% of this value when it is subjected to accelerated weathering for 500hrs as per ASTM G155 standard. The logo of the manufacture shall be embossed on either side of the body in the injection molding process. The flexible median marker shall have U shaped florescent sheeting should confirm to Type XI Florescent Yellow sheeting as per IRC 67 and ASTM D4956-11. The product design has to with stand all natural impacts and should not get damaged if any pedestrian stamp on top of it intentionally and unintentionally. The product should bend upto 90 degree on both sides (becoming completely horizontal). It should be able to take minimum 200 stamping without any grouting/drilling as per Engineer in Charge.

Measurements for Payment

Median marker shall be measured as a finished work in numbers.

Payment

The Contract unit rate for the supply and fixing shall be payment in full for carrying out the work as per these Specifications.

1515 Precast New Jersey Barriers

(1) Scope

This Section covers the requirements to be met by the Contractor in relation to the materials, fabrication, transportation and installation of Precast New Jersey (NJ) Barriers along the roads. The purpose of NJ barriers is to reduce the risk of an out-of-control vehicle crossing the main road and colliding with the traffic on service roads or vice versa. These can also be used for barricading construction site from moving traffic during road construction to increase the safety of road workers. NJ Barriers also reduce the risk of a vehicle deflecting back into the traffic stream after colliding with the barriers by allowing the errant vehicles decelerate within tolerable limits and by directing traffic in a prescribed manner.

(2) Applicable Standards

RCC NJ barriers shall comply with the requirements of ASTM 825: Standard Specification for Precast Concrete Barriers or its equivalent IS or NS (where available). If required by the Engineer, the contractor shall demonstrate the functioning of crash barriers employing the standard procedure for safety performance evaluation recommended by the Manual for Assessing Safety Hardware (MASH), previous (NCHRP – 350).

Concrete strength shall be tested in accordance with ASTM C39 or equivalent and average strength values for daily testing shall be equal to or greater than the specified design strength. Cross-sectional and longitudinal dimensions, locations and positioning of anchoring devices and reinforcement shall be acceptable to the Engineer.

Two cubes for each 20 cum of concrete or a minimum of 2 cubes per day's production shall be tested in accordance with ASTM C31 or equivalent procedure. These cubes shall have compression strength required for M25 Grade concrete.

(3) Materials

Cement, aggregates, admixtures and steel reinforcement shall conform to applicable ASTM Specifications or to the relevant Clauses of the Specifications as applicable for the materials used for other similar RCC structures in Clause 2000 of these Specifications.

(4) Manufacture

Concrete mixture shall be proportioned and mixed to meet the minimum strength level and cured as per the methods outlined in Section 7 of the ASTM C 825 specification. Formwork used shall be sufficiently rigid to maintain dimensional parameters. All casting surfaces shall be of smooth and tidy finishes free from honeycombs, porous materials or cement sand plasters. Concrete design strength shall be for M25 in 28 days. Air entrainment shall have air content of 5 ½ +/- 1% as measured by ASTM test method C 173 or C 231 or equivalent applicable standards.

Concrete surfaces shall be finished at the option of the manufacturer (contractor) but these should be comparable to the F3 finish and be uniform for all sections in the contract lot.

Steel Reinforcement shall be provided as shown in the drawing or as designated by the Engineer. Reinforcement shall be designed by the producer or contractor (as the case may be) and be sufficient

to permit handling delivery and placement of sections without damage. Minimum concrete cover is 50 mm, except for end sections where cover may be less. See applicable project or ASTM specifications for specific details.

Barriers shall be assembled as a cage with sufficient mat and bar to maintain shape during casting. Reinforcement design for the ends of barrier sections should be in accordance with the publication "Concrete Median Barrier Research," Volume 2, Research Report, prepared by the Southwest Research Institute for the FHA, to prevent fracture at the joints. Laps, welds and splicing shall be acceptable to the Engineer and develop full strength of reinforcement.

Cross sectional dimensions shall not vary from design by more than 6 mm. Vertical centerline shall not be out of plumb by more than 6 mm. Longitudinal dimensions shall not vary from design by more than 6 mm in 3 m long barriers and not exceed 20 mm per section.

(5) Handling and Transport

Unless otherwise specified, the minimum length of each barrier section will be 3 m long. For straight sections, Engineer may ask the contractor to provide NJ barriers of 6 m long or more (up to 10 m).

Lifting devices (hooks etc) shall not be cast into the side surfaces of the barriers. Anchorage to prevent lateral movement of the barrier shall consist of dowels and keyway joints on interlocking devices shall be as specified by the Engineer. Location of anchoring shall be as specified by the Engineer.

(6) Measurement and Payment

Erection of NJ barriers shall be measured by the linear meter in place and paid under the Bill of Quantity Item. The rate shall include for the manufacture / supply / transportation of new precast barriers (loading, handling, unloading, excavation, foundation preparation (sand pad, leveling, concreting), preparation of surface, laying in the position, fixing correctly to the lines and levels as per drawings or as directed by the Engineer. No separate payment for concrete or reinforcing steel or formworks etc shall be paid. Any barriers that have edges broken, concrete chipped away during transportation shall not be paid not plastering would be allowed to make surface look good.

1516.A Solar Street Lighting Systems

(1) Definition

A standalone solar photovoltaic (SPV) street lighting system (SLS) is an outdoor lighting unit used for illuminating a street or an open area. It consists of photovoltaic (PV) module(s), compact Light-emitting diode (LED), lead acid battery, control electronics, inter-connecting wires/cables, module mounting Pole including hardware and battery box. The LED is fixed inside a luminaire which is mounted on the pole. The PV module is placed at the top of the pole at an angle to maximize incident solar radiation, and a battery is placed in a box attached to the pole. The module is mounted facing south, so that it receives solar radiation throughout the day, without any shadow falling on it. Electricity generated by the PV module will charge the battery during the day time. This system operates from dusk to dawn.

(2) Scope

This section covers the requirements to be met by the Contractor in relation to the materials, fabrication, installation, testing and commissioning of solar street lighting systems. The street light system consists of the specific tied electrical hardware, mast arm poles, and footing which includes

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excavation, breaking of concrete or any other hard surface such as road pavement, concreting, erecting poles to lines and levels and curing the concrete and re-instatement of the surface to its original condition and disposal of excess spoil materials: on an all complete net basis.

The solar street lighting system shall be provided along the sections of road passing through built up areas, on areas of high pedestrian activity and at all pedestrian zebra crossings and intersections as shown in the drawings or as directed by the Engineer. Electric poles along the bridges shall be anchored as shown in the bridge drawings or as directed by the Engineer. The Contractor shall be required to submit shop drawings of the anchorage details for Engineer's approval.

(3) Specifications of the Solar Street Lighting System

A. Duty Cycle

The system should automatically switch ON at dusk, operate throughout the night and automatically switch OFF at dawn.

B. PV Modules(s)

(i) Both crystalline and thin film technology modules are allowed in the system. The PV module should have a certificate of testing conforming to IEC 61215 Edition II / BIS 14286or IEC 61646 for crystalline and thin film PV modules respectively. The certificate should be from an NABL or IECQ accredited Laboratory;

(ii) The power output of the module(s) under STC should be a minimum of 150 Wp. Either two modules of minimum 75 Wp output each or one module of 150 Wp output should be used. In case of thin film technology PV modules, the specified values refer to the stabilized power output after the initial degradation. The module efficiency should not be less than12%;

(iii) The operating voltage corresponding to the power output mentioned above should be16.4 ± 0.2V;

(iv) The open circuit voltage of the PV modules under STC should be at least 21.0Volts;

(v) The terminal box on the module should have a provision for opening for replacing the cable, if required;

(vi) Each PV module must use a RF identification tag (RFID), which must contain the following information:

a. Name of the manufacturer of PV Module.

b. Model or Type Number

c. Serial Number

d. Month and year of the manufacture

e. I-V curve for the module

f. Peak Wattage of the module at 16.4volts

g. Im, Vm and FF for the module

h. Unique Serial No and Model No of the module Until March 2013, the RFID can be inside or outside the module laminate, but must be able to withstand harsh environmental

conditions.

(vii) A distinctive serial number starting with NSM will be engraved on the frame of the module. The distinctive number starting NSM will also be screen printed on the tedlar sheet of the module.

C. Battery

(i) Lead Acid, tubular positive plate flooded electrolyte or Gel or VRLA Type;

(ii) The battery will have a minimum rating of 12V, 150 Ah (at C/10 discharge rate);

(iii) 75 % of the rated capacity of the battery should be between fully charged and load cut off conditions.

D. Lamp

(i) The lamp should be 40Watt LED;

(ii) The light output from the lamps should be around 4000±5 % lumens (for 40 W LED);

(iii) The lamp should be housed in an assembly suitable for outdoor use, with a reflector on its back;

(iv) No blackening or reduction in the lumen output by more than 10%, should be observed after 1000 ON/OFF cycles (two minutes ON followed by four minutes OFF is one cycle);

E. Electronics

(i) The inverter should be of quasi sine wave/ sine wave type, with frequency in the range of20 - 30 KHz. Half-wave operation is not acceptable;

(ii) The total electronic efficiency should be not less than 85%;

(iii) The idle current consumption should not be more than 10mA;

(iv) The PV module itself should be used to sense the ambient light level for switching ON and OFF the lamp.

F. Electronic Protections

(i) Adequate protection is to be incorporated under no load conditions e.g. when the lamp is removed and the system is switched ON;

(ii) The system should have protection against battery overcharge and deep discharge conditions;

(iii) Fuses should be provided to protect against short circuit conditions;

(iv) Protection for reverse flow of current through the PV module(s) should be provided;

(v) Electronics should have temperature compensation for proper charging of the battery throughout the year.

G. Mechanical Hardware

(i) A metallic frame structure (with corrosion resistance paint) is to be fixed on the pole to hold the SPV module(s). The frame structure should have provision to adjust its angle of inclination to the horizontal between 0 and 45, so that the module(s) can be oriented at the

specified tilt angle;

(ii) The pole should be made of mild steel pipe with a height 6m above the ground level, after grouting and final installation. The pole should have the provision to hold the weatherproof lamp housing. It should be painted with a corrosion resistant paint; All poles will be of slip base type. This type of special purpose Street Lighting Pole addresses the universal problem of high-speed road accidents (over 60km/h) involving road side collisions with light poles. These poles shall comply with Australian Standards1158.1.3 or equivalent Indian Standards. Slip Base Poles differ in design which features the two base plates bolted together with the facility of freely coming apart if a crash occurs. This separation lessens resistance and mitigates the overall effects of the impact (and subsequent damage to the vehicle or injury to its occupants); All poles shall be tapered round of specified diameter and consist of standard base-plate mounted with either in-ground section or connection spool on rag bolts, bolts, slip washer and rectangular washers. All poles shall be hot dip galvanized to Australian Standards4680:2006 or equivalent Indian Standards and shall be either powder coated or painted as approved by the Engineer. The slip base poles shall be in a single and double outreach arm arrangement, curved or straight as approved by the Engineer. Poles shall have security or tamper proof screws for access door covers;

(iii) A vented, acid proof and corrosion resistant painted metallic box for outdoor use should be provided for housing the battery with a provision of lock and key.

H. Other Features

(i) The system should be provided with 2 LED indicators: a green light to indicate charging in progress and a red LED to indicate deep discharge condition of the battery;

(ii) There will be a Name Plate on the system, which will give: (a) Name of the Manufacturer or Distinctive Logo. (b) Serial Number;

(iii) Components and parts used in the solar street lighting systems should conform to the latest BIS specifications, wherever such specifications are available and applicable;

(iv) The PV module(s) will be warranted for a minimum period of 25 years from the date of supply and the street lighting system (including the battery) will be warranted for a period of two years from the date of supply. PV modules used in Solar Street Lighting System must be warranted for their output peak watt capacity, which should not be less than 90%at the end of Twelve (12) years and 80% at the end of Twenty-five (25) years. The Warranty Card to be supplied with the system must contain the details of the system;

(v) Necessary lengths of wires/cables and fuses should be provided;

(vi) An Operation, Instruction and Maintenance Manual, in English should be provided with the Solar Street Lighting System. The following minimum details must be provided in the Manual: basic principles of photovoltaics; a small write-up (with a block diagram) on the Solar Street Lighting System – describing its components (PV module, battery, electronics and luminaire) and their expected performance; a section on charging and significance of indicators; together with clear instructions about erection of poles and mounting of PV module (s) and lamp housing assembly on the pole.

(4) Measurement and Payment

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Project Director

The solar street lighting system including all the PV modules, battery, lamp, electronics and electronics protection, mechanical hardware including solar light pole including foundation excavation, placing, foundation concreting as per drawings and other features for the complete functioning of the solar street lighting system shall be measured in number or in sets (Nos./Sets) and paid under the respective contract price on BOQ. The contract price and/or rates shall be the full and the final compensation to the Contractor as per Clause 112.

1516.B Electric Street Lighting Systems

Codes and standards

The electrical system design will comply with the following standards and codes.

1. IS 1944 (PT 5): Code of practice for lighting of public thoroughfare: Part 5 Lighting for Grade separated junctions, bridges and elevated roads.
2. IS 1944 (PT 1&2): Code of practice for lighting of public thoroughfare: Part 1 & 2 for main and secondary roads (Group A and B).
3. IS-3043 Code of practice for Earthing.
4. The Electricity Act 2003 for electrical works.
5. National Electrical Code.
6. Indian Electricity Rules, 1956 (Latest Revision)
7. IRC – SP: 84 Manual of Specifications & standards for Four Laning of Highways.

Design conditions

All equipment and material will be selected and rated for use at the following site conditions:

- Design Temperature. 40 Deg. Cen.
- Summer outdoor Design temperature. 45 Deg. Cen.
- Relative Humidity. 90 % RH

Purpose of lighting

Lighting has always been an effective tool to promote a City / Town / Village. It is not only a functional requirement, which provides safety and security to motorists and residents; it helps in creating an identity and image. A well-lit Roads / Highways are always a reassuring place for its residents to stay and move around. It has an economic benefit by way of attracting tourists and assuring its residents to stay out longer. Industries, Hotels & Restaurateurs, Commercial Shop owners, Educational Campus, Clubs and Social areas are direct beneficiaries, which contribute positively to the overall economy.

It does not need any elaboration that dark roads deter people and well-lit surroundings attract people. At the same time, Road lighting if not planned well can create anarchy in visual

environment (both in day and night) and lead to energy waste, which is very precious in current context. Better infrastructure leads to more comfortable driving conditions. At the same time, speed of driving increases which re-emphasizes the need to have upgraded lighting conditions to match World Class standards.

The current Indian Standard IS 1944:1970 Part: I & II & Part V should be in the process of revision. Internationally, Road lighting standards have been revised to address the growing complexity of traffic conditions-both volume and density, and addressing need of energy conservation. This report aims to set recommendation aligning with current international practices and at the same time not violating conditions as laid down in IS 1944, to bring Roads to World Class levels.

Design Basis

When designing a highway lighting system, there are numerous factors to consider. This section presents design considerations commonly encountered in highway lighting designs.

TYPICAL HIGHWAY LIGHTING DESIGN PARAMETERS	
Maintenance Factor	0.75-0.8
Percent of Voltage Drop Allowed	5 % (at end point)
Typical parameters for Highway / Bridge / Flyover and Service Road lighting	9 / 10 / 11 Mtr. Height Hot Dip Galvanized steel tubular swaged pole as per IS – 2713 and 250 W / 150 W / 70 W HPSV Luminaries
Typical parameters for High Mast lighting	25-30 Mtr. Height High Mast Lighting Tower asper ILE TR -7 specification and 400 W HPSV Luminaries

Common Criteria

The following are common for all types of highway lighting systems:

Photometric Data - The Photometric data utilized in all calculations shall be the latest data available from the Manufacturer.

Source of Lamps - High pressure sodium lamps shall be used:

Maintenance Factors - All lighting Systems depreciate with time. The design values shall consider appropriate reduction in initial illumination values. The maintenance factor to be utilized is 0.75 – 0.8 to take into account pollution level.

Design configuration for main traffic roads:

Following Design configurations will be the basis of detailed designing to be followed. Detailed designing for individual sections will be done by concerned agencies depending on site situations. However, pole heights, brackets, tilt angles will be strictly adhered to,

1. Road classification : group a1
2. Road type: four lane carriageway + service road (grade separated structures & vup)

DESIGN CONFIGURATION FOR SERVICE ROAD:

1. Road classification : group a2
2. Road type : dual carriageway (2 lane)

HIGH MAST LIGHTING SYSTEM

The lighting calculations to determine the required illumination shall be based on the following definitions and criteria:

Location / Area – All Major Intersections & the traveled highway including shoulders, Service Roads shall be considered in the calculations.

In determining the location of light towers, review the plan view of the area to determine the more critical areas requiring lighting. In selecting tower locations, consider the following:

Critical Areas: Locate light towers so that the highest localized levels of illumination fall within the critical traffic areas (e.g. Freeway / ramp Junctions, ramp terminals, merge points).

Roadside Safety: Locate light towers outside the roadside clear zone and a sufficient distance from the roadway so that the probability of a collision is virtually eliminated. Do not place light towers on the end of long tangents.

Signs: Locate light towers so that they are not within the driver's direct line of sight to highway signs.

High Mast Lighting Standard Assembly Setback

Minimum 1.25 meter measured from the face of crash barrier or edge of pavement to centerline of high mast lighting standard and installed in the gap between the both

carriageway on bridge deck and their foundation shall be casted on the ground level under bridge deck. A lesser setback may be used. Should a lesser setback be approved, appropriate protection must be provided.

Luminaries

High mast type 400 watt high pressure sodium vapour luminaries, as per manufacturer. The luminaries shall produce a symmetric, long and narrow or asymmetric distribution. A maximum of 9 to 11 luminaries of the same or different distribution shall be clustered to provide the required pattern of light distribution from the high mast lighting assembly.

Mounting Height - The tower shall be 20-25 meter. The actual highway elevations shall be used in the calculations.

HIGHWAY / BRIDGE DECK / FLYOVER LIGHTING SYSTEM

The lighting calculations to determine the required illuminance shall be based on the following definitions and criteria:

Roadway Width - Actual width of highway pavement considered in calculations, including medians, service roads excluding shoulders where they exist.

Lighting Standard Setback - As required, minimum 1.2 meter measured from the face of curb or edge of pavement to centerline of lighting pole.

Luminaire Mounting Height - For 250 watt luminaries 9-10 meter Height of Pole above Ground Level. So pole will be selected depend upon Civil Foundation arrangement (Directly Buried in Ground / on Base Plate with U Bolts above ground level). Select the Pole Specification as per Steel tubular Pole As per IS: 2713.

Lighting Standard Bracket Arm – As per highway Carriage way + Central Median widths, a 1.0-2.0 meter length bracket arm is to be used.

Luminaire Overhang - As required.

Luminaries –The following luminaries shall be considered:

250 / 150 / 70 watt conventional type high pressure sodium Vapour Lamp luminaries

LIGHTING STRECHES WITH DESIGN CRIETERIA

As per IS: 1944 (Part-I & II), this highway road is classified as Group A1 (Main Carriageway at Grade structures / Flyover / Overpass on Interchange area). Based on above criteria, the highway lighting has been designed to obtain minimum lux value of 40 lux.

For other main roads carrying mixed traffic is classified as Group A2 (Service road at interchange area / VUP etc.). Based on above criteria, the lighting have been designed to obtain minimum lux value of 15 lux.

Lighting at all Vehicular Underpass / Pedestrian Underpass an average 100 lux level of shall be maintained same as per toll canpoy lighting (because of no specific lighting standards mentioned for VUP / PUP).

At Grade Structures i.e. intersections / Major junctions, 20/25/30 meter high mast lights have been proposed with 400 W HPSV Lamps. Use of one nos. of High mast pole at each Major junctions & remaining area (Flyover / service road) will be covered by street lighting.

All lighting design of Grade structures / Major junctions / Flyovers / VUP / PUP will be done through DIALux / CalcuLux software & results are attached.

Lighting in main carriageway will be considered at 30m length beyond the junction on street lights with 10 meter height pole as required.

Truck lay Bay

Average 40 Lux

Uniformity Ratio : Min / Ava. > 0.4

Hot Deep Galvanized Swaged Pole - 9 / 10 Mtr. Lighting Fixtures with HPSV Lamp (250W)

Truck Parking Area

Average 40 Lux

Uniformity Ratio: Min / Ava. > 0.4

High Mast - 20/25 Mtr. lighting by using MH / HPSV Lamp (Due to Area of the Truck parking lot entire lighting will not be covered by street pole so combination of both High mast & Streetlight pole used)

Hot Deep Galvanized Swaged Pole - 9 / 10 Mtr. Lighting Fixtures with HPSV Lamp (250W)

Top and underside of grade separated structures including half and full flyovers as well as Underpasses

Bridge

Average 40 Lux

With services road the street light pole should be double arm at 180 watt is the main road and 120 watt for services road side. at 30 meter interval.

Without a service road, The street light should be 180 watt with a 30 meter interval.

Grade Separated Structure / Major Junctions

Main Carriageway on Flyover

Average 40 Lux

Uniformity Ratio : Min / Ava. > 0.4

Hot Deep Galvanized Swaged Pole - 9 / 10 Mtr. Lighting Fixtures with HPSV Lamp (250W)

Service Road

Avg. 15 Lux

Uniformity Ratio : Min / Ava. > 0.4

Hot Deep Galvanized Swaged Pole - 9 / 10 Mtr. (Same used for Flyover) Lighting Fixtures with HPSV Lamp (70W)

Below Flyover Bridge Deck Interchange Area :

Average 40 Lux

Uniformity Ratio : Min / Ava. > 0.4

Lighting Fixtures with HPSV Lamp (250 W / 150W)

VUP

Main Carriageway on Flyover

Average 40 Lux

Uniformity Ratio : Min / Ava. > 0.4

Hot Deep Galvanized Swaged Pole - 9 / 10 Mtr. Lighting Fixtures with HPSV Lamp (250 W)

Service Road

Average 15 Lux

Uniformity Ratio : Min / Ava. > 0.4

Hot Deep Galvanized Swaged Pole - 9 / 10 Mtr. (Same used for Flyover) Lighting Fixtures with HPSV Lamp (70W)

VUP - UNDERPASS PARAPET LIGHTING

Ava. 100 Lux

Uniformity Ratio : Min / Ava. > 0.4

Lighting Fixtures with HPSV Lamp (150W)

The street lighting arrangement should be 08 nos lights,120/180 watt. power capacity of lights you can use as per site condition.

PUP

Ava. 100 Lux

Uniformity Ratio : Min / Ava. > 0.4

Lighting Fixtures with HPSV Lamp (70W)

The street lighting arrangement should be 4 to 6 nos lights,120/180 watt. power capacity of lights you can use as per site condition.

Grade major junction

Average 40 Lux

Uniformity Ratio : Min / Ava. > 0.4

High Mast Height = 20/25/30 Mtr. (Height of the Mast will be selected as per 3 lane / 6 Lane Interchange structure)

1516.C Solar Traffic Blinker

LED based "SOLAR BLINKER" is highly reliable and designed for 24X7 operations to alert the road users at the intersections / U- turns. These blinkers are used at accident vulnerable locations, diverging points, unsigned intersection, turns, blind spots, school zones etc. to warn the motorists to slow down and to avoid accidents.

Technical Specification:

Parameter	Description
Display color	**Amber/Red**
Operation	**24 Hours (Day & Night) or 12 Hours (Night Only)**
System voltage	**12.0 VDC**
Aspect diameter/	**300mm (12 Inch) or 200 mm (8 Inch)**
Power consumption	**300 mm: 8 W Maximum, 200 mm: 5 w maximum**

Type of PCB	**Epoxy glass FR4 pcb**
No. Of Led	**300 mm signal: 180 Nos 5 mm ultra-bright leds** **200 mm signal: 174 Nos 5 mm ultra-bright leds**
Dusk to Dawn operation	**Optional**
Body/Enclosure	**Polycarbonate**
Lens	**UV stabilized, Molded, water clear polycarbonate**
LED viewing angle	**24 degree**
Lamp intensity(Centre Lux)	**Greater than 330 cd**
IP protection	**IP65**
Number of Flashes Per Minute	**40 FPS**
Visibility	**Greater than 500 meters**
LED wavelength	**Amber 600±5nm, Red 625±5nm,**
Visibility	**500 meter**
Charge controller methodology	**Three stage battery charge monitoring algorithm**
LED driver efficiency	**Greater than 90 percent**
LED driver methodology	**Dual PWM dc-dc buck converter**
Ideal current consumption	**Less than 2 ma**
Protection	**Short circuit protection** o **Battery over charge protection** o **Battery Deep discharge protection** o **PV reverse voltage polarity protection** o **Battery reverse voltage polarity protection o Software watch- dog for LED over current**
Pole:	**12 feet ms powder coated, 3 inch diameter, 1.6 mm thickness, yellow powder coated with solar panel mounting bracket and accessories.**

1517 Tubular Steel Pole

1. Description

i. The steel tubing used in pole fabrication shall be of steel of any approved process possessing a minimum tensile strength of 42 Kg/sq. mm and a chemical composition of not more than 0.06% Sulphur and not more than 0.06% phosphorous.

ii. The tubing diameter and tubing wall thickness shown in Table 1 for each length of pole are the minimum size to be used in fabricating each length of pole.

iii. Tubular poles shall be made of welded tubes, swaged and joined together. The upper edge of each joint shall be chamfered at an angle of about 45-degree. The steel poles shall be composed of three sections of diminishing diameters and minimum diameter thickness and lengths of pole shall be as shown in Table 1. Steel Tubular pole street lights are of three types, viz double armed, single armed and dislocated double armed.

iv. All tubes forming parts of the above supports shall be made from hot insulated seamless or continuously welded steel in accordance with BS 6323 or equivalent applicable Standards.

v. The bottom section of the poles shall be galvanized with minimum coating of weight not less than 460-gm/-sq. m internally and externally. The length of the bottom section including the base plate to be galvanized shall be as follows:

11 m pole	2.5 m
9 m pole	2.25 m

vi. The remaining portion of the pole shall be painted with one coat of red oxide primer as specified in IS 2074-1997.

vii. Each pole shall be provided with a steel top plate 3-mm minimum thickness welded to the end of the section. The top plate shall not project beyond the perimeter of the top section. Each pole shall also be provided with a welded base plate welded to the bottom of the pole.

viii. The size of the base plate shall be as per governing standard.

2. Tolerance

The following tolerances shall be maintained:

a. Tolerance of diameter: +/-1%
b. Tolerance on weight: +/-7.5% on each pole.
   1. +/-5% on a bulk load.
c. Tolerance on thickness: +/10% on each sheet.
d. Straightness: The finished poles shall not be out of straightness by morethan 1/600 of the height.

3. Tests

The following test (s) shall be performed for the pole furnished.

a. Tensile test and chemical analysis for sulphur and phosphorous
b. Deflection test
c. Permanent set test
d. Drop test

List of testing equipment available with the manufacturer for final testing of equipment specified and the test plant limitation, if any, vis-à-vis the type, special, acceptance and routine tests specified in the relevant standards.

Table 15.1 Poles Specification

IS Designation	**410SP- 52**	**410 SP-43**	**410 SP-31**	**410 SP-13**
Overall Height	11 m	10 m	9 m	8 m
Planting depth. m **Sections: Length, m**	1.8	1.8	1.5	1.5
Top (h1)	2.7	2.4	2	1.75
Middle (h2)	2.7	2.4	2	1.75

IS Designation	410SP- 52	410 SP-43	410 SP-31	410 SP-13
Bottom (h3) **Outside Diameter, mm**	5.6	5.2	5	4.50
Top (h1)	114.3	114.3	114.3	88.9
Middle (h2)	139.7	139.7	139.7	114.3
Bottom (h3) **Thickness, mm**	165.1	165.1	165.1	139.7
Top (h1)	3.65	3.65	3.65	3.25
Middle (h2)	4.5	4.5	4.5	3.65
Bottom (h3)	4.5	4.5	4.5	4.5
Approximate weight, Kg	175	160	147	101
Crippling load, kgf **Application of load from**	307	348	367	301
top of pole, m	0.6	0.6	0.3	0.3

Must be supplied Along with standard Cross Arms and Bracings Angles,

Pole Clamps, GALVANISED STEEL BOLTS, NUTS AND MISCELLANEOUS FASTENING COMPONENTS, TRANSFORMER PLATFORMS fabricated from hot-rolled channels, angles and steel members. Thesteel channels and angles for transformer platform shall be fabricated in accordance with Indian Standards IS: 226-1975 and IS-808-1964or any revision thereof or other equivalent national or international standard provided that the resulting steel stock is of equal quality and strength. The minimum tensile strength of the steel shall be 4200 kg/cm2. Existing Transformer shall be reused.

1. Payment

Upto 10% of the steel tubular poles of the street Lighting will be single armed and dislocated double armed swan types as shown in drawing. Rates for this reduced portion quantity of single armed poles will be proportionately reduced by 20%.

1518 Relocation/Re-erection of Electrical Works

This sub-clause cover the relocation/ re-erection of electrical works. The Contractor shall execute this works as per Nepal Electricity Authorities Specifications (Distribution System Construction Standard and Nepal Electrical Act-2049).

1519 Bus Stop Shelters

(1) General

Bus stop shelter has been provided at bus stops with an aim of a comfortable environment with some protection and basic facilities during waiting periods for the passengers seeking transport service. These structures are constructed with steel RCC frame support, RCC roofing system, aluminum frame glass panels/walls, wooden seats for waiting passengers, and with solar lighting facility.

(2) Bus Shelter

It comprises of RCC frame, which support the of the RCC Slab roof. The foundations/base for the RCC Frame to be constructed as per drawing and design. The floor shall be of 100mm thick Plain Cement Concrete (Grade M20/20) with the class F2 finish and cement interlocking tile.

On two sides of the bus shelter comprising width sides and the backside, aluminum frame panels fitted with 8mm thick unbreakable glass panel/walls shall be installed as shown in the drawing.

The seating bench base shall be made of 1st class brick masonry (1:4 c/s) and having cement plastered top. On top of the base a wooden seat/bench made of 50mm thick hardwood (Sakhuwa) strips laid and fitted intact without gaps with proper joinery. The size of seats shall be 500mm wide and back rest shall be of 400mm height. All fixtures shall be properly planed, polished and fitted at site as per drawing and instruction of the Engineer.

The bus stop area and the shelter shall be illuminated and have electric power points required for other purposes (like mobile charging). A PSC electric pole of 9m height shall be supplied with all accessories and erected at site as per drawings and specifications. This will be connected to a solar power system having a solar panel of capacity 100 Watt output and wirings and required fixtures shall be located at site as per drawing or instruction of the Engineer.

The digital information display board (in English and Nepali Language) shall be installed at the bus shelter.

The construction of bus shelter shall include supply, fabrication and installation of all components, fixtures at site all complete as indicated in the drawings. Testing of solar panel, lighting system is also to be included in this item.

(3) Measurement and Payment

The Bus-stop shelters will be measured in number for each Type. Payment for each unit and type shall be made after the completion and testing of unit and type with all its components.

1520 Traffic Signal

(1) Basic Requirements

All civil works, field equipment and facilities shall be installed in accordance with the requirements of the DOR or its designated representative (Engineer). The contractor shall submit details of the proposed equipment and facilities, installation methods, footing details, etc., and shall obtain approval of the Engineer before installation.

The contractor shall supply a FSD (Final System Design) for approval by the Engineer before any Notice to Proceed (NTP) to install traffic light at the intersection or pedestrian crossing (as the case may be) is issued. FSD shall be prepared in accordance with the best international practice for the installation of civil, electrical and telecommunication infrastructure which shall be approved by the Engineer.

(2) Traffic Controllers and Allied Equipment

Controllers and ancillary equipment provided shall at a minimum meet the requirements of the Electro-Magnetic Compatibility standards of the country of origin.

All controllers must be microprocessor based and compatible with the operation of an ITS and must be the type approved at least to the standards of the country or state of origin. The supplier shall submit type approval documentation stating clearly the conformity to environmental and destructive tests – wind, rain, dust, dampness, humidity, dry-heat and vibration.

All controllers shall be capable of signal display voltage dimming between 230V AC and 160V AC. Dimming shall be operated by the time-of-day schedule.

(3) Power Supply Requirements

Power Supply for the installation shall be arranged by the Contractor by means of a secured 24 hour local supply (recommended) as proposed by the Contractor during the FSD process and shall be metered where appropriate, single phase with filter protection against over-current, and shall incorporate earth leakage and short circuit protection. The Power Supply shall be terminated in a separate fuse-box unit, located in close proximity to the controller, or in an agreed position with the Engineer. Ducting shall be installed between the fuse unit and the controller as directed.

The supply compatibility of the controller and ancillary equipment shall be 230V AC (+/- 15 percent), 50 Hz (+/- 1 percent), 30 amp minimum. Actual power supply requirements shall be confirmed by the Contractor taking into account the number of heads, length of cable runs etc. It is the responsibility of the contractor to establish electrical power supply availability and conditions with the Electricity Supply Company.

The power requirement, range to connect to the LED signal heads under undimmed and dimmed mode shall be as specified in the relevant items in the BOQ or or as per the requirement of the equipment supplier.

A consumer earth terminal shall be supplied and located adjacent to the mains "cut out'. The controller power supply should be able to absorb mains power interruptions of 75 milliseconds without any interference to the operation of the microelectronics or signal displays and this applies equally to dimming operation.

A minimum of two 13-amp electricity sockets (General Purpose Outlets – GPOs), comprising RCD or equivalent shall be provided within the controller case and shall be of Universal 13 Amp design. These outlets shall not be used to support any permanent equipment, and are for the use of maintenance personnel only.

(4) Backup Power System Requirements

Uninterruptible Power Supply units that provide operational continuity in the event of loss of Mains AC power shall be required. The UPS and Batteries shall be rated to industrial temperature ranges and shall be designed to operate in hot and cold conditions dependent on the ambient temperature of the batteries. The intended backup system shall operate at 230VAC / 50Hz.

The unit shall be robust and sufficiently protected against lightning power surges and other spurious power surges on the mains inputs. Solar Panel shall be supplied in order to assist charging mechanisms.

The intersections in the East West Highway require a separate cabinet solution for small to medium intersections that cater up to 18 signal groups with a maximum load of 850VA. The UPS shall be housed in a separate cabinet to that of the Traffic signal controller and CCTV network but adjacent to them.

At this maximum load level, the UPS and Battery combination shall be required to provide approximately 12 hours of backup time in the event of loss of Mains AC.

The UPS charging unit shall be fitted with a front panel display so that maintenance technicians can monitor input voltages, output voltages and currents, and other historical data such as time of disconnection and time on UPS power. The display shall also provide information on expected time remaining on UPS at current consumption.

The UPS charging unit shall have a front panel interface that allows service personnel to view the status of all critical values such as input, output voltages and currents as well as time of loss of Mains AC.

The UPS shall provide an interface (clean contacts) to the traffic signal controller special inputs in order that the central traffic computer may receive warnings on mains power and battery health and levels.

The case or cabinet for the UPS shall be lockable and vandal proof and be of a similar minimum standard and specification as that of the traffic signal controller.

(5) Telecommunications Connections

Telecommunication circuits (if specified) shall be terminated within the controller case through a separate conduit. The termination point shall consist of a firmly anchored telecommunication box containing a line isolation unit for fixed lines, or encompassing a master termination box (telephone type socket) for dial-up PSTN connections (To be agreed in the FSD or advised by the Engineer during system expansion). The Engineer may specify a separate, termination and test, access panel on the controller cabinet.

Ducting from the controller case to the nearest telecommunication chamber or pole shall be provided, and remain separate from all other ducting.

The location of the telecommunication chamber (where applicable), shall be agreed on site with the Engineer.

(6) Modes of Operation

The traffic signal controller shall be capable of operating in the following modes:

i. Full Computer Control;

ii. Linked and coordinated by means of synchronized clock (cable-less);

iii. Vehicle Actuated (VA) or Isolated;

iv. Hurry call for priority to particular movements (e.g., ambulance, fire brigade, other emergency vehicles, VVIP vehicles/ motorcade etc.);

v. Manual intervention and option for setting different phase cycle for different time duration (minimum time duration 60 minutes), option for always green/red (as per requirement) traffic light;

vi. Amber flashing on all approaches for linkage with pedestrian push-buttons and signals and coordinated controls; and

vii. Fault Mode – either blacked out or hardware flashing yellow displays.

The priority mode (in future) shall be that of control by a central computer. Real time – second – by - second monitoring shall be the preferred option, but this ultimately depends on the type of communications available or approved by the Engineer. Real time monitoring may not be achievable in the absence of fixed telecommunication / fibre optic circuits. Until the stage of establishment of the Regional Traffic Management Centre (RTMC), the priority mode will be vehicle actuated or isolated mode by time of day. The controller shall however be capable of resorting to fully adaptive, real time detection and signal time assignment with computer control in the regional or central traffic

management centre.

The contractor shall establish the availability of landlines or Fibre Optic Network (FON) or other proposed modes of communications where applicable.

In the event of a loss of communications or computer control or any fault, each controller should immediately revert to (CLF) cable less linking mode and failing that should then fall-back to vehicle actuated mode, or as programmed by the operators.

(7) Controller Facilities

The controller shall incorporate the following basic facilities:

- Capability to switch, operate, monitor type approved LED vehicles and pedestrian signal heads including (a) dimming of the LED displays; (b) monitor "last red' for all vehicle displays including arrow, Bus, Cycle displays with minimum 5W undimmed power for each aspect;
- Up to 32 vehicle movements to include 8 pedestrian movements;
- Up to 48 vehicle detector inputs monitored for s/c or o/c;
- Up to 16 physical pedestrian pushbutton inputs monitored for s/c or o/c;
- Pedestrian demand acknowledgement output – e.g., 'wait' indicator
- Time of day control of pedestrian audio / tactile facilities;
- Time of day and light sensor control of dimming facilities;
- Maximum Green timing control for each stage – 3 selectable sets per stage;
- Minimum Green selectable for each stage/phase movement;
- Vehicle Amber or Yellow adjustable and with s/w flashing control;
- Controllable clearance intervals for pedestrian movements;
- Selectable Flashing Red Man or Flashing Green Man clearances;
- All Red time adjustable between stage/phase changes;
- Inter-green time adjustable dependent on controller stage/phase movements;
- Stage extension timers associated with VA control – 3 per phase;
- Late start and Early Cut Off (ECO) timing facilities for phase movement control;
- Lamp failure monitoring facilities for each lamp of each phase;
- Full conflicting displays monitoring (green versus green or loss of reds);
- Hand Held Terminal (HHT) facilities for on-site maintenance;
- Integral self-tuning detectors and test functions (e.g., group flash, lamp loads);
- Detector fault monitoring (open circuit, short circuit and occupancy);
- Integral modem facilities for computer control;
- Up-loadable and downloadable timings and linking plans;
- Non-corruptible safety timings (usually held in EPROM);
- Input and output monitoring for detectors and pedestrian pushbuttons;
- Programmable general-purpose inputs and outputs;
- Stage/phase hurry call facilities – e.g., bus priority or emergency vehicle or VVIP vehicles;
- Stage/phase call/cancel facilities;
- CLF – 10 plans and 20 Time of Day / Week schedules;
- Manual selection of either Vehicular Activation (VA) or CLF modes for maintenance
- Comprehensive remote fault monitoring (Control Centre) for the following:

- Controller on/off (by fault or power failure);
- Controller in flashing mode;
- Operational mode – CC - CLF – VA – Manual- Hurry call- Amber flashing
- Dimming on/off;
- Display conflict or loss of Reds;
- Lamp failure;
- Vehicle detector or pedestrian pushbutton failure;
- Faulty general-purpose inputs or outputs

In addition, the controller should be able to remotely count traffic as configured – volume and occupancy – and to download such data as a basis for selectable plan changes. The exact features and operational design shall depend on the system approach to adjusting the control of timings in order to meet changes in traffic demands.

Controller programming facilities shall be configurable in every respect by a PC based programme that shall produce an EPROM (or some other non-volatile method) holding the controller basic operational dimensions and safety timings. Up-loadable and downloadable information for day-to-day controller traffic operations may be held in RAM or as directed in real time from the regional or central TMC computer (provision for future) and the controller (now).

All controller manual stage selection buttons (where specified) shall be clearly identifiable as defined in the controller specifications or as otherwise agreed with the Engineer.

(8) Computer Control and Monitoring

The competent Authority of GON shall set the standard for controller compatibility within the preferred ITS System Architecture. At that time and thereafter - all controllers shall be fitted with all necessary interface equipment for remote monitoring and on-line real-time monitoring capabilities.

All intersection traffic signals and pedestrian crossing installations shall be capable of supporting on line control and monitoring equipment as advised by the DOR.

The Adaptive Traffic Control (ATC) system shall be based on strategically placed detectors (or virtual imaging detectors) throughout the East West Highway that shall feedback data on saturation and volumes to the TMC (when established in future). Based on this data the central control computer (or the local controller - if specified in the programming) shall allocate priority by selective phase introduction, and/or set plan selection or phase movement times and cycle times for the system controllers in the network. Strategic detectors (real or virtual) may be included as Vehicular Actuation (VA) or Bus actuated in the future) detectors at any particular intersection or crossing.

In accordance with the capacity building process, it is envisaged that all intersections shall eventually be connected to a central computer, for part-time or full-time control and monitoring. This communication facility may consist of a standard two-wire telephone landline circuit that may consist of a dedicated point-to-point connection or FON. It is not envisaged to utilise a PSTN dial-in and dial-out connection for traffic control. Interface modems in the controller should be integrated in the rack or on board the CPU.

Separately, and in future plans, a cellular network or Private Mobile Radio network based system may be incorporated for Fleet Management, Ticketing, Weather Information, VVIP movement and Bus Information and in this regard each bus or VVIP vehicle shall transmit a priority call to any intersection

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traffic signal controller. Traffic controllers shall be capable of receiving and relaying such radio signal inputs.

(9) Detection – Vehicles and Pedestrians

Vehicular Actuation (VA) detection and pedestrian push button Unit (PBU) detection shall be supported at all traffic signal installations.

Pedestrian crossings shall use detection as defined by the DOR at the time of bidding. This will consist of inductive loop detection or virtual imaging detection for the vehicle lanes. The DOR may stipulate Pedestrian presence detection or on-crossing detection at the time of bidding.

Intersection traffic signal equipment shall initially be installed with inductive loop or virtual imaging detection for the vehicle lanes. In accordance with the capacity building programme of the DOR, loops (inductive or otherwise) will have a tactical and strategic designation. In general, one loop per approach (whether inductive, actual or virtual) is deemed adequate by the DOR and its position shall be near the stop-line, or as directed by the Engineer. Vehicle or bus queue/flow loops may also be required to support the planned ITS control and monitoring facilities. Additional loop detectors if any proposed are as provided in the BOQ.

(10) Vehicle Actuated - Isolated Operation

Isolated controllers should support operation in VA mode and make best use of maximum green timings in order to achieve optimum operation. At least 3 sets of scheduled maximum green times shall be provided. Unused max green time from a movement should be capable of transfer to any other movement. Also, if a movement is to be skipped out of a sequence its maximum green time should be available to the running movement, or transferable to any other movement.

(11) Facilities for Pedestrians / Cyclists and Disabled Road-Users

It is the policy of the DOR to provide facilities for visually and aurally impaired road-users and those with mobility disadvantages. All new traffic scheme installations in the national highways shall (as agreed in the specific and detailed design), be provided with suitable facilities for these road-users. At the appropriate time facilities for cyclists may also be stipulated for any specific scheme. In particular, the following points should be noted:

- Dropped kerbs and 'T' shaped tactile paving aprons may be specified in some cases and shall therefore be provided as agreed in the contract or with the Engineer.
- Tactile and/or audio-tactile signals shall be provided in pushbutton units and connected in accordance with the Final System Design (FSD) or as directed by the Engineer. Audible signals shall not be provided unless the all red phase for vehicles is present. Similarly, tactile signals can only be used if all vehicles in conflicting directions can be signalled to stop.
- If the signals displays are off or in flashing yellow mode, the tactile and audible facilities shall be inoperative.
- Fall-back flashing yellow must be provided from a separate hardware flasher within the controller.

Push Buttons shall be installed so that pedestrians are prompted to look towards the nearest

approaching traffic stream whilst pressing the button. Additional push buttons may occasionally be required and provided if instructed by the Engineer. Push Button Units shall operate at ELV 50 Hz.

(12) Selected Vehicle Priority (SVP)

Selected vehicle priority technology is constantly evolving and becomes available in many options for many different vehicles and transport modes. No particular option is discounted by the DOR and each shall be considered on its merit at the time of the Invitation to Tender (ITT). The SVP shall be specified indicatively at the time of bidding. In general, all traffic systems and control equipment shall support:

For Buses:

- An inductive loop system (or virtual imaging system) usually used for selective signal control or hurry call
- Special bus transponders for remote monitoring and selective signal control
- Reception of Short Range Radio signal for controller and/or ATC instructions

For Priority Vehicles (Ambulance, Fire Truck, VVIP)

- Strategically placed inductive loops for selective signal control (or virtual loops)
- Special tag / transponders for remote monitoring and computer signal control
- Hurry Call for Emergency Vehicles (Ambulance or Fire Tender) - Usually 'hurry call' facilities based on a manual input (e.g. fire station emergency button), or selective loop positioned in order to call a special stage or phase movement, and to send a message to a central computer.

(13) LED Lanterns – General Requirements

Vehicle signal heads shall be of a sturdy moulded construction and fitted with backing boards, appropriate visors or hoods. The aspects shall be supplied with LED type technology for both vehicles and pedestrians and complete technical details shall be submitted at the time of bidding and must be finally agreed with the Engineer prior to installation. In general, the vehicle signal head should conform to the requirement detailed below.

Traffic signal display sequences shall be agreed during the FSD process. The contractor shall provide sequences for each intersection in a summarized tabular form for approval by the Engineer. Signal head and aspect configurations shall be shown on intersection detail shop drawings of intersections prepared by the contractor and the same submitted to the Engineer for approval.

The Colour displays shall be as follows:

- Green / Amber / Red - to vehicles (Flashing Amber as directed)
- Green Man / Flashing Red Man / Steady Red Man - to pedestrians

Single multi-colored aspects or animated aspect displays are not acceptable.

The fabrication and supply of all components for the traffic signal heads shall conform to relevant AS, BS standards and specification.

The electrical requirements of the LED vehicle signal head shall also be clearly stated by the contractor for the specific manufacturer but in general should conform to or exceed relevant AS or BS including

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the capability to operate at the following voltages.

The Contractor shall furnish details for the proposed specific manufacturer to the Engineer for approval but in general the lanterns should conform to, or exceed relevant AS or BS within a temperature range of -25° to 70° C.

Signal head assembly and backing board shall be able to withstand wind speeds up to 160 kmph in any direction.

The minimum electrical requirements are as follows:

- 180V to 240V AC main supply for LV installations
- 42 V AC for ELV installations
- 12 V DC for solar installations
- Capability to operate on both 180V to 240V AC or 42 VAC with minor modification
- LV Maximum load Undimmed = 15 Watts
- LV Minimum Load Undimmed = 5 Watts (For ELV = 3W)
- Maximum Power use in shut down mode undimmed = 0.6 Watts
- Luminous intensity in the dimmed state = 50% to 75% of undimmed

The lantern bodies shall be of adequate strength and durability in order to withstand the conditions during installations and normal operations. Lanterns shall be dust-proof, weather-proof against corrosion and not suffer any significant deterioration or degradation from direct sunlight.

All traffic signal heads, displays and associated hardware should have Type Approval from the concerned approving agency in the country of origin and should be compatible for operation and full function of the traffic signal controller proposed for this contract.

(14) LED Lanterns - General Specification

In general, signal lanterns should meet and agree with ISO 9001:2000 certification

Luminous intensity should comply or exceed EN12368. Other requirements include:

- No LED dots should be visible and there should be a uniform signal glow as with a single light source aspect
- A high Anti-Phantom Performance is required (Class 5)
- Aspects shall have a Low Power Consumption and Brilliant Light Output
- All products shall be traceable by Serial Number
- Aspect Masks shall allow for any Symbol Display
- The Life Cycle shall exceed 5 Years
- Degradation shall be reduced to a minimum by optimum heat balance
- Aspects shall exhibit Automatic Light Compensation in the case of individual LED failures
- LEDs shall be capable of Dimming Function Control by reduced voltage

The rear-side of the pedestrian signal head should have the manufacturer's name, model number, serial number engraved. In addition, the operating characteristics such as nominal operating voltage, power consumption, VA, load for the walking and standing person display, standard specification that the signal head conforms to, etc., should also be labelled on the backside.

(15) Requirement:

Requirement of accessories for 4-Way, 3-Way and Signalized Pedestrian Crossing are as follows:

i. Supplying, installing, testing, commissioning, remote monitoring and providing advice on operation and maintenance of traffic lights at 4 way intersections with the following items included, all complete:

a) Beacon controller- 18 signal groups and 8 loop detectors with 1xCentral Management Unit (CMU), 3xLamp Control Unit (LCU), 8XLoop detectors, and 1xUSB Memory Stick for Personality No, Dimming No 5-position Manual Facility Switch No independent Flasher with complete set;
b) Traffic Software License required for controller;
c) Beacon BX0-86-30-18-00 Equipment Plate with Logic Rack for 18 signal groups and 6 loop detectors with 1xCMU, 3xLCU, 4 loop detectors and 1xUSB Memory Stick for Personality;
d) Lamp Control Unit (LCU) with 18 signal groups;
e) Central Management Unit (CMU) with built-in LED indicators, SD Memory Slot, Ethernet Port, USB and Seriall Ports;
f) Hand held terminal 4 for operators with 1 spare (total 5);
g) Media XML communication interface for queue length data;
h) Spare Stop Line Camera Detector for commissioning;
i) Controller Flasher Module;
j) Police (Facility) with required positions;
k) GPS Clock and related hardware for Controller;
l) 4X Stop Line camera detectors;
m) Camera Interface Unit (CIU).

ii. Supplying, installing, testing, commissioning, remote monitoring and providing advice on operation and maintenance of traffic lights at 3 way intersections with the following items included all complete

a) Beacon controller- 18 signal groups and 6 loop detectors with 1xCentral Management Unit (CMU), 3xLamp Control Unit (LCU), 6XLoop detectors, and 1xUSB Memory Stick for Personality No, Dimming No 5-position Manual Facility Switch No Independent Flasher with complete set;
b) Traffic Software License required for controller;
c) Beacon BX0-86-30-18-00 Equipment Plate with Logic Rack for 18 signal groups and 6 loop detectors with 1xCMU, 3xLCU, 4 loop detectors and 1xUSB Memory Stick for Personality;
d) Lamp Control Unit (LCU) with 6 signal groups;
e) Central Management Unit (CMU) with built-in LED indicators, SD Memory Slot, Ethernet Port, USB and Seriall Ports;
f) Hand held terminal 4 for operators with 1 spare (total 5);
g) Media XML communication interface for queue length data;
h) Spare Stop Line Camera Detector for commissioning;
i) Controller Flasher Module;
j) Police (Facility) with required positions;

k) GPS Clock and related hardware for Controller;
l) 3X Stop Line camera detectors;
m) Camera Interface Unit (CIU).

iii. Supplying, installing, testing, commissioning, remote monitoring and providing advice on operation and maintenance of traffic lights at signalized pedestrian crossings with:

a) Beacon controller- 6 signal groups and 4 loop detectors with 1xCentral Management Unit (CMU), 3xLamp Control Unit (LCU), 4XLoop detectors, and 1xUSB Memory Stick for Personality No, Dimming No 5-position Manual Facility Switch No Independent Flasher with complete set;
b) Traffic Software License required for each controller;
c) Beacon BX0-86-30-18-00 Equipment Plate with Logic Rack for 6 signal groups and 4 loop detectors with 1xCMU, 3xLCU, 4 loop detectors and 1xUSB Memory Stick for Personality;
d) Lamp Control Unit (LCU) with 18 signal groups;
e) Central Management Unit (CMU) with built-in LED indicators, SD Memory Slot, Ethernet Port, USB and Seriall Ports;
f) Hand held terminal 4 for operators with 1 spare (total 5);
g) Media XML communication interface for queue length data;
h) Spare Stop Line Camera Detector for commissioning;
i) Controller Flasher Module;
j) Police (Facility) with required positions;
k) GPS Clock and related hardware for Controller;
l) 2X Stop Line camera detectors;
m) Camera Interface Unit (CIU).

(16) Measurement and Payment

Supplying, installing, testing, commissioning and providing training on remote monitoring, operation and maintenance of the traffic signals/system shall be measured in number*(Number of intersections shall be measured in such a way that "Supplying, installing, testing, commissioning and training on remote monitoring, operation and maintenance of traffic signal/system in the intersection under consideration shall be measured as one number")*of intersection and shall be paid as per the respective contract unit rate which shall be the full and final compensation to the Contractor as per Clause 112.

1521 Edge Rumble Strip

(1) Definition

An edge rumble strip is a longitudinal safety feature installed on a paved roadway edge. It is made of series of raised elements intended to alert inattentive drivers (through vibration and sound) that their vehicles have left the travel lane. The edge rumble strip is placed directly at the edge of travel lane with the edge line pavement marking placed through the line of rumble strips. Edge line rumble strip have the potential to reduce run off road crashes on any paved road.

(2) Design parameters

The edge rumble strip shall be 50 mm in length, 150 mm in width and 8 mm thick. It shall be placed 250 mm c/c. The edge rumble strip shall be made up of bituminous binder covered with fine aggregate (Sand).

(3) Construction

The surface where edge rumble strip will be placed shall be prepared in accordance in sub-clause 1303 (7) and shall comply Clause 1312 Sand Asphalt of Standard Specifications for Road and Bridge Works 2073 (Second Amendment 2078).Template in the size of the rumble strip shall be made and placed on the edge of the road. The bitumen sand mix then shall be placed in the template. Then it will be finally compacted with hand roller.

(4) Aftercare and control of traffic

The road shall be opened to traffic when instructed by the Engineer. The traffic shall be kept off the rumble strip until it has cured to a firm condition to prevent pick up of the mixture.

(5) Measurement and Payment

All edge rumble strips shall be measured by linear meters of completed and accepted length (length of pavement surface) in place. Edge rumble strips measured as above shall be paid at the contract unit rate. The contract unit rate shall be the full and final compensation to the Contractor as per Clause 112.

Add the following sub section as 1612 (5) (a) Viii

1612 (5) (a) Viii: While carry out the pile boring to placing of concrete, necessary testing, construction of pile cap and sub structure the Contractor shall make necessary arrangement to protect the stability and protection of existing structures. The Contractor shall start the work after providing such arrangement to the satisfaction of the Engineer.

Insert the following above last paragraph of sub section as 1612 (5) (b)

The Contractor shall propose the requirement of any protection arrangement as mentioned in sub section 1612 (5) (a) Viiito the Engineer for his approval. Unless otherwise specifically instructed by the Engineer about type and design of the protection work, the Contractor shall arrange sheet pile with required retaining capacity so as to maintain the stability and safety of existing structure.

Replace last sentence of 1612 (6) (a) by:

Drilling/Boring works for pile is allowed only with rotary or oscillator type drilling equipment. Percussion hammer drilling/DTH Hammer drilling/ Vibratory type of drilling like water or air jetting for boring of piles shall not be allowed. Use of other methods of borehole stability is subject to approval by the engineer.

Add the following after first sentence of 1612 (6) (b):

Boring /Drilling of the piles is preferred in a staggered pattern.

Replace clause 1612 (7) by the following:

Stability of borehole shall be ensured by use of temporary casing of approved quality. Use of other methods of borehole stability is subject to approval by the engineer. As well as the Contractor shall ensure the stability of the existing structure during the construction of the new bridge.

Replace the last paragraph under 1614(1) with the following:

The Contractor shall carry out the loading test on test pile as specified in sub section 1614(2) and 1614 (3).Before constructing the pile works the Contractor shall construct a test pile to the location as specified by the Engineer and perform the above-mentioned loading test. If the test results are found to the satisfaction of the Engineer the pile shall be a part of permanent structure.

Add following Sub Clauses 1614 (5) after sub clause 1614(4) "Pile Integrity Test" as below.

(5) PDA Test –Foundation Piles

The Contractor shall carry out the following High Strain Dynamic Test (popularly known as Pile Dynamic Analyzer or PDA) on;

a) Foundation piles on which load test will be carried out,

b) One of working piles selected by the Engineer in each sub structure with pile foundation.

i. Specification

a) The purpose of high strain dynamic testing shall be to obtain pile capacities for bridge foundation piles with a higher confidence level than obtainable with a static load test. This shall be achieved by correlating dynamic tests with static load tests on pilot piles.

b) Theequipmentfordynamictestingshallbe'PileDynamicAnalyzer'(PDA)orsimilarapproved

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equipment conforming to the requirements of as finalized by the Engineer.

c) Ram weight, height of fall, cushioning (wood + steel plate) to prevent damage to pile head shall all be in accordance with standard documented international practice.

d) This work shall be carried out by a specialist sub-contractor who shall employ a professionally qualified engineer with a minimum of 5 years of experience in pile dynamic testing using PDA or similar equipment. He shall be in charge of testing and interpretation of results. He shall present himself at least by video contact for interview prior to being engaged.

ii. Number of Test Piles

Dynamic pile testing shall be carried out on one working pile for each substructure with pile foundation as selected by the Engineer. However, the Engineer may reconsider the total number of piles to be tested depending on the quality of results.

iii. Test Report

On completion of all field work, the specialist engineer shall prepare a final report covering all aspect of pile load-settlement behavior including ultimate tip resistance and ultimate shaft resistance. This final report shall incorporate results of the PDA monitoring, and results of all CAPWAP-Case Pile Wave Analysis Program computer analyses. The results of CAPWAP analysts shall be compared to the PDA results and correlations shall be drawn between the CAPWAP results and the PDA field monitoring results.

Add following text at the end of the first paragraph of clause 1616 (2) "Loading Test"

"Loading test shall be carried out on working pile of one in each bridge"

Rewrite the second paragraph under Section 1617 "Measurement" as below:

For cast-in-situ driven and bored concrete piles of specified cross-section, the measurement, for boring and providing & installation of 6mm thick permanent steel casingcasing from bottom of the pile cap upto 0.5m below the maximum scour level and as specified in 1614 (1), shall be the length in metres of the accepted pile that remains in the finished structure complete in place. Reinforcement in cast-in-situ driven and bored concrete piles shall be measured for payment as per Section 2000

Rewrite the third paragraph under Section 1617 "Measurement" as below:

Boring, installing 6mm thick steel casing, reinforcement, concreting for the test pile shall be measured under relevant items in the BOQ separately. But the loading tests on test pile (working pile) as mentioned under 1614 (2) shall be measured in number.

Please delete second last paragraph under Section 1617 "Measurement".

The Pile integrity test shall not be measured separately. It is deemed to be included in the relevant item in the BOQ.

High Strain Dynamic Test (popularly known as Pile Dynamic Analyzer) shall be measured in number.

Please add the following at the end of the Section 1617

The measurement of the protection work (sheet pile) done for the existing structures as per

1612(5a, viii) and 1612 (5b) shall be made in square meter (depth x length).

Please delete the contents under section 1618 "Payment" and replace with the following:

The payment for cast-in-situ driven and bored concrete piles of specified cross-section, for boring and providing & installation of 6 mm thick permanent steel casing as specified in 1614 (1) and those specified in Clause 112, shall be made at the contract unit rate

Reinforcement in cast-in-situ driven and bored piles shall be paid at the contract unit rate as specified in Section 2000.Concrete and reinforcement in pile cap shall be paid separately at the contract unit rate as specified in Section 2000.

Pile shoes when called for on the Drawing or by the Engineer shall not be paid for separately, but full compensation for all the work involved in supplying and fitting pile shoes shall be considered as included in the unit rate for pre cast concrete piles and no additional compensation shall be allowed.

Splicing of piles, when allowed, shall not be paid for separately but full compensation for all the work involved shall be considered as included in the unit rate from pre cast concrete piles.

Additional quantities of concrete, reinforcement and form work, caused by incorrect location of piles or additional piles necessary to replace defective piles shall be at the Contractor' s expense.

The Payment of the protection work (sheet pile) done for the existing structures as per 1612 (5a, viii) and 1612 (5b) shall be made as per the respective BOQ item rate.

No separate payment shall be made for the Pile Integrity test.

High Strain Dynamic Test shall be paid at the contract unit as provisioned in Bill of Quantities which shall be full compensation for Pile Instrumentation, Accelerometer, Strain transducer, Pile Driver Analyzer, Impact Pile Driving Hammer, labour, transportation, professionals, recording and reporting including all incidentals necessary to complete the test.

Loading tests on Test piles (working pile) shall be paid at contract unit rate which shall be full and final compensation for the cost of all operations and incidental costs associated with testing operation thereof in addition to those specified in Clause 112.

Whatsoever the written above, the rate shall also include the cost of undertaking 'confirmatory sub-soil investigation' as per Clause 1619, boring equipment, standard penetration testing, split spoon sampling, boring, excavation, concreting, inspection and control, cutting off, welding, coupling and all related tools, rigs, cranes, jets, frames, leads, labour, barge mounted platform/island of adequate sizes and other incidental equipment and work necessary to complete the work.

Section 1900 – Bearings and Expansion Joints

1901 Expansion Joints

Add following Clauses after clause 1901(6) "Strip Seal Joint" and renumber 1901(7) and 1901(8) to 1901(9) and 1901(10)

(7) Compression Seal Expansion Joint

Compression seal joint consists of steel armoured nosing at two edges of the joint gap suitably anchored to the deck concrete and a preformed chloroprene elastomer/closed cell foam joint sealer compressed and fixed into the joint gap with special adhesive binder. The seal is supposed to remain in continual compression due to pressing of the seal wall against joint faces throughout the service life to ensure that the joint remains water tight and capable of repelling debris. Typical compression seal joint is shown in **Fig.19.1**

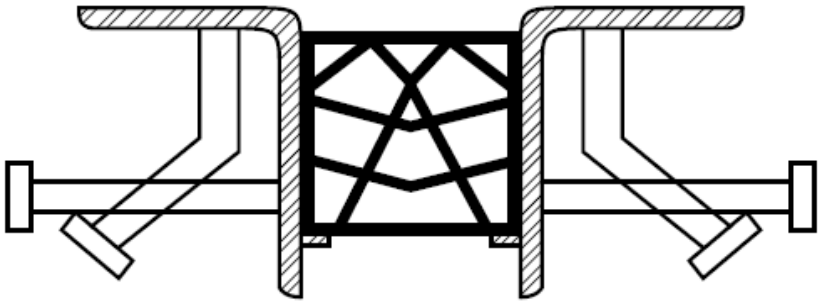

Fig. 19.1 Compression Seal Expansion Joint

Fabrication/ Pre-installation, handling and storage, installation and acceptance tests shall be same as sub clause 1901(6).

(8) Reinforced elastomeric Expansion Joints

This type of joint consists of reinforced elastomeric pads connected to a supporting steel structure which itself is cast into the concrete structure of the bridge. The joint accommodates movement by shear deformation of elastomer and opening and closing of grooves at upper and lower surface. The maximum movement is limited by the gap width. Typical reinforced elastomeric joint is shown in **Fig19.2.**

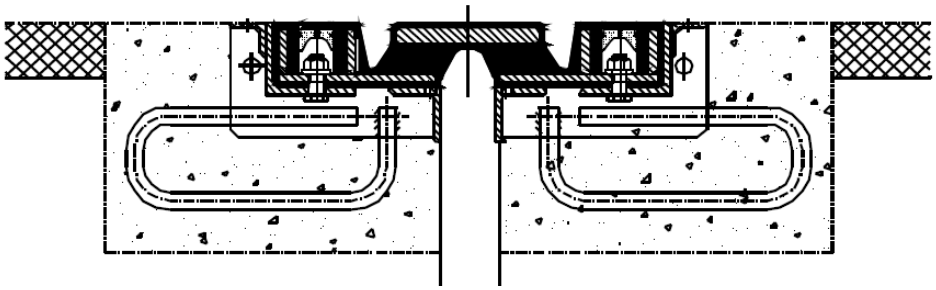

Fig19.2 Reinforced Elastomeric Expansion Joints

Fabrication/ Pre-installation, handling and storage, installation and acceptance tests shall be same as

sub clause 1901(5).

Add following at the end of first paragraph of sub clause 1902 (4) "Elastomeric Bearing"

Proposed bridge are laminated type. For the laminated bearing the dimensions and properties shone on the drawings are tentative, based on IRC: 83-2018, Part II, Table B2. The actual design shall be carried out by the manufacturer on the basis of provided load and deformation data.

Section 2000 – Concrete for Structures

2004 The Design of Concrete Mixes

Add after Sub-Clause: 5(a)

The test cubes prepared during the trial mixes shall be designated preliminary test cubes and as such shall comply with Clause 2004 Sub-Clause 5(a) of the Standard Specifications.

The engineer shall require the contractor to make trial mixes and preliminary test cube at least 40 days before the start of concreting.

Add Sub clause (6) "Contractors Responsibility" after Sub clause (5) "Quality Control of Concrete Production":

(6) Contractors Responsibility

All necessary labour, materials, equipment, etc., for sampling, preparing test cubes, curing, crushing of cubes, etc. shall be provided by the contractor. The cube-crushing machine to be provided by the contractor, in accordance with this special provision, shall be approved by the engineer and shall be duly calibrated by an independent inspector/ agency approved by the engineer.

The machine shall be recalibrated at one (1) year intervals or more frequently if instructed by the Engineer, all at the Contractor's expense.

Testing of other materials and concrete may bear ranged by the Engineer in an approved independent laboratory at the cost of the Contractor in case the equipment is not operational or test facility does not exist at site.

As a confirmatory test, the Contractor shall carry out the third party lab test on his own cost upon the request of the Engineer.

2006 Transportation of Concrete

In the last paragraph delete from the end of first sentence "…shall not be longer than the initial setting time of the concrete" and substitute:

".. shall not be longer than 45 minutes. At the discretion of the Engineer, when the ambient air temperature is below 30 degrees Centigrade and conditions are suitable this period may be increased to 90 minutes but in no case shall it be longer than the initial setting time of the concrete."

2007 Placing of Concrete

(3) Placing Procedures

In the first sentence delete "…as nearly as possible in its final position." and substitute with:

"…as nearly as possible to and in no case more than 3 metres from its final position."

Add to the 8th Paragraph as a final sentence.

"In no case shall concrete be discharged from such devices at a height of more than 1.5 metres above its place of final disposition."

2011 Concreting in Hot Weather

(2) Concrete Placing in Hot Weather

Insert as Final Paragraph:

"Concrete shall not be placed when the ambient air temperature exceeds 40 Degrees Celsius unless the Contractor submits a proposal for special precautions and receives written approval from the Engineer."

2012 Construction Joint

Add after Clause 2012

The surface of the concrete against which fresh concrete is to be placed is to be maintained in a damp condition for 24 hours before placing the fresh concrete.

2014 Reinforcement

Add after Sub-Clause (4)

Prior to pouring the concrete all reinforcement placed in position shall be checked and approved by the Engineer.

Section 2100 – Pre-stressing

Insert new Clause 2119 "Lifting and Placing of Precast Girders" after 2118"payment" as follows:

2119 Lifting and Placing of Precast Girders

(1) Description

The Work shall consist of:

1. Lifting or launching of the precast post-tensioned girders from the precast yard;
2. Transportation if required;
3. Installation of the girders at the designated space on the substructure;
4. Securing the girders in place for further operations with necessary false work or bracings.

(2) Submittals

The Contractor shall submit the following to the Engineer, in accordance with this Specification, for his approval:

a) A Girder Transportation Plan, if required, identifying the loading and transportation procedures, including the proposed route, schedule and traffic control procedures.

b) A Girder Erection Plan comprised of a schedule and detailed procedure clearly illustrating the method and sequence by which the Contractor proposes to unload and erect the precast pre-stressed concrete girders.

The Girder Erection Plan shall include detailed notes and Shop Drawings, as necessary to describe the following:

i. Access to undertake work, including earth berms, work bridges, and/or platforms;
ii. Type and capacity of equipment;
iii. Sequence of operation, including position of cranes, trucks with girders, and traffic accommodation for all stages of unloading and erection;
iv. Detailed crane position on the ground, particularly adjacent to substructure elements, such as piers and abutments;
v. Details of temporary supports, false work and bracings, including proposed methods to be used to ensure structure stability during further construction activities.

(3) Compliance

The Contractor shall strictly adhere to the following instructions:

Duringanyoperationoftransportationorerectionthegirdersshallbelifted by two nos of Crain, only by the lifting loops provided at both ends. In the absence of such loops the girders shall be lifted by holding at both ends, the position of grip or support being at the designated position of bearing centerline. Lifting the girder by any kind of grip or support towards the mid-span is strictly prohibited.

a) The re-bars projecting outside the girder concrete surface, such as shear connector bars at the to port he dowel bar sat the positions of cross girders or diaphragms, or any other bar provided for the purpose of further construction shall not be used for any operation of lifting, transportation or securing the girder in place. All such bars shall be kept in the

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shape shown in the drawings.

b) Any kind of support, fulcrum or underpinning at any position towards the mid-span from the designated position of bearing centerline is strictly prohibited during storage, lifting, transportation or installation of the precast girders.

(4) Measurement and Payment

Unless specified otherwise in the contract, the item of lifting, transportation and installation of the girders shall be considered one job per girder and shall be measured and paid in number per girder. All the incidental costs including the submittals shall be considered included in the quoted rate.

Section: 2400 River Training and Protection Works

Add to the Sub clause 2402 (7) "Construction" paragraph (v) "Filling" following:

"Stones obtained from dismantling of existing stone masonry works and Gabion structures may be used by the Contractor for the permanent work if they comply with requirement of the Specification."

Section 2600 – Masonry for Structures

2603 Construction

(1) General

Add the words "levelled, compacted" after the word "cleaned" in the first sentence of fourth paragraph.

Section 2800 – Bio-Engineering Works

2802 Provision of Seeds

(2) Tree and Shrub Seed Collection

Delete Clause 2802 (2) (f) and substitute:

(f) Seeds shall only be collected when fully ripe. Seeds collected early shall not be accepted. The Contractor shall be held liable if the germination rate of seeds is lower than the rates given for each species in manuals and information bulletins published by the Geo-Environmental Unit of the Department of Roads or the Ministry of Forests and Soil Conservation.

2803 Provision of Plant Cuttings

(2) Provision of Hardwood Cuttings

Delete Clause 2803 (2) (g) and substitute:

(g) Hardwood cuttings are to be 20 to 40 mm in diameter and 300 to 500 mm long for palisades, vegetated stone-pitched wall sand for pegging jute netting; 450 to 600mm for brush layers; and a minimum of 1000mm long for fascines. These sizes should not be exceeded unless specified or approved by the Engineer.

Delete Clause 2803 (2) (h) and substitute:

(h) For live check dams, all cuttings are to be 2000 mm in length; the cuttings for cross pieces should be 20 to 50mm in diameter and the truncheon cuttings for the vertical elements should be 30 to 80 mm in diameter: truncheon cuttings are made from the species listed in Clause (i) below. These sizes should not be exceeded unless specified or approved by the Engineer.

Delete Clause 2803 (2) (j) and substitute:

(j) Once cuttings have been made, they shall be wrapped in wet hessian jute immediately. At all times,cuttingsshallbekeptmoistandascoolaspossible,andshallbewrappedinwet hessian between all operations such as taking from the parent plant, trimming and planting. Under any circumstances, all cuttings shall be planted the same day that they are made.

(1) Provision of Bamboo Cuttings

Delete Table 28.2: Types of bamboo cuttings and substitute:

Table 28.2: Types of Bamboo Cuttings

Local name	Botanical name	Best propagation	Details
Choya/tamabans	*Dendrocalamushamiltonii*	Rhizome cuttings / Single node culm	Rhizome cuttings:culm2500-3000mmlength, leave all branches; rhizome300-500mm. Single node Culm cuttings: 1 node and 150mm

Local name	Botanical name	Best propagation	Details
			of culm each side, straight and fine cut, main branch should be 200-300 mm long.
Dhanu bans	*Bambusabalcooa*	Rhizome cuttings / Single node culm	Rhizome cuttings: culm2500-3000mmlength, leave all branches; rhizome300-500mm. Single node culmcuttings:1node and150mm of culm each side, straight and fine cut, main branch should be 200-300 mm long.
Kalo bans	*Dendrocalamus Hookeri*	Rhizome cuttings / Single node culm	Rhizome cuttings: culm 2500-3000 mm length, leave all branches; rhizome 300-500 mm. Single node culm cuttings: 1 node and150mm of culm each side, straight and fine cut, main branch should be 200-300 mm long.
Mal bans	*Bambusanutans(subsp. cupulata)*	Rhizome cuttings	Rhizome cuttings: culm 2500-3000 mm length, leave all branches; rhizome 300-500 mm.
Nibha/ghopi / lyas bans	*Ampelocalamusp atellaris*	Rhizome cuttings	Rhizome cuttings: culm 2500-3000 mm length, leave all branches; rhizome 300-500 mm.
Padang bans	*Himalayacalamus hookerianus*	Rhizome cuttings	Rhizome cuttings:culm1500-2000 mm length, leave higher branches; rhizome 200-300 mm.
Tharu bans	*Bambusanutans (subsp. nutans)*	Rhizome cuttings	Rhizome cuttings: culm 2500-3000 mm length, leave all branches; rhizome 300-500 mm.
Titenigalo bans	*Drepanostachyu m intermedium*	Rhizome cuttings	Rhizome cuttings:culm1500-2000 mm length, leave higher branches; rhizome 200-300 mm..

2806 Final Slope Preparation for Bio-Engineering

(2) Final preparation of fill Slopes for Bio-Engineering

Add, between Clauses (b) and (c) the following:

If backfilling is required behind a retaining structure, the trimmed material shall be compacted at intervals as the operation proceeds. This will require halting the trimming. The debris shall be redistributed and compacted as backfill. Compaction shall be carried out in level layers approximately 100 – 150 mm thick, laid back into the slope at about 5. In dry conditions, water shall be added while compacting the material.

2807 Site Planting and Sowing

(2) Direct Seed Sowing of Shrubs and Trees on Site

Delete 2807 (2) (a) and substitute:

a. The Contractor shall be required to carry out the sowing of shrub and tree seeds along the green belt, median, road side or any other location specified by the Engineer in accordance with the Engineer's specific instructions(if any).

Delete 2807 (2) (g) and substitute:

(g) In some cases, the Engineer will instruct that seed shall be broadcast on to the slope. In this case, seeding shall be started at the top of the site, working down slope as evenly as possible so that the whole site is lightly covered. This shall be instructed where the site is still active and only warrants minimum expenditure, or where the site is naturally rough, providing plenty of niches in which the seed can catch. Quantities of seed shall depend on the type of seed involved but are generally half that of the quantities used in the nursery. With utis (*Alnus nepalensis*)seed it should beat rate of 1gramme of seed per square metre.

Delete 2807 (2) (h) and substitute:

(h) **Measurement and Payment:** Work shall be measured in square metres on the basis of the actual area of surface over which seeds have been sown. The payment shall be the full and the final compensation to the Contractor for making arrangements for traffic control, providing seeds, all labour, tools, equipment, safety harness and incidentals to complete the work as specified herein. If the seeds are supplied through a separate contract, costs for the supply of the same shall not be included herein. However, if the Contractor is responsible for the supply and storage of seeds no separate payment shall be made for these items.

(3) Site Planting of Grass Slips and Cuttings

Delete 2807 (3) (e) and substitute:

(e) All grass slips, whether supplied to the Contractor from a nursery (if so provided in the Contract) or otherwise obtained by the Contractor, shall be prepared for planting by the Contractor as given below. The Contractor shall transport them from the source wrapped in hessian jute. At all times, plants shall be kept moist and as cool as possible, and should be wrapped in wet hessian between all operations such as extraction from the bed, pruning and planting. Under any circumstances, all plants shall be planted in the same day that they are lifted from the nursery or other source.

(4) Site Planting of Shrubs and Trees raised in Polythene Pots

Delete 2807 (4) (a) second sentence and substitute:

(a) The Contractor shall be required to carry out the planting of seedlings along the green belt, median, road side or any other location specified by the Engineer in accordance with the Engineer's specific instructions (if any).

(6) Brush Layering, Palisades and Fascines

Delete 2807 (6) (d) and substitute:

(d) If the instruction to the Contractor includes the provision of cuttings, then the Engineer shall specify the species and expected sources, and the Contractor must then obtain the cuttings required. This shall be done in the manner described in Sub-clause 2803 (2), wherein the size of the cuttings shall be 20 -40mmin diameter and of length 300-500mm for palisades, 450-600 mm for brush layering and a minimum of1000mm for fascines.

Delete 2807 (6) (e) and substitute:

(e) Cuttings of the following species, if specified for truncheons, shall be a minimum of 2000

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mm in length: chuletro (*Brassaiopsishainla*), dabdabe (*Garugapinnata*), kavro (*Ficuslacor*), phaledo (*Erythrina species*) and Gliricidiasepium.

Delete 2807 (6) (k) (iv) and substitute:

(k) (iv) Cuttings shall then be laid along each trench, so that they lie horizontally along the trench. There shall normally be eight cuttings together, although where material is short a minimum of four cuttings is permissible at the Engineer's discretion. They shall be over lapped so that no two ends coincide. Under no circumstances shall buds be damaged. The cuttings shall then be tide using jute or coir (coconut fibre) string at 500 mm intervals to form a bundle, as the fascine is created, it thereby forms a continuous bundle right across the slope.

2810 Site Protection

Add Clause 2810 (5) as follows:

(5) Fabrication and Placement of Steel Tree Guards

The Contractor shall provide steel tree guards as shown on the Drawings in place of the bamboo tree guards as specified in the Clause 2810 (2). No bamboo tree guards shall be accepted.

The steel tree guards shall be placed in line with the provisions detailed in the Clause 2810 (3).

No separate payment shall be made for the fabrication and placement of steel tree guards. All the associated cost is deemed to be included in the relevant item of tree and/or shrub plantation.

2811 Site Aftercare and Maintenance

Delete Clause 2811 (12) and substitute:

(12) Measurement and Payment

"No separate payment will be made for site aftercare and maintenance and all the associated cost is deemed to be included in the relevant item rate".

Add new Clause 2813 "Site Planting of Bamboo" as follows:

2813Site Planting of Bamboo

(a) The planting of bamboo is intended to replace or restore something of the natural vegetation on the slope to be treated. The Contractor is required to carry out the planting of seedlings to the Engineer's specific instructions.

(b) The spacing of plants will be determined according to individuals it conditions. However, it will normally beat two meters across a slope and five-meters up and down the slope.

(c) Select a suitable culm of the parent clump and dig out the rhizome carefully. Cut off the clump about two meters above the ground level. Cut the rhizome where it branches from the main plant, taking great care not to damage buds and small roots.

(d) Wrap the root ball in damp Hessian and transport the cuttings to site for planting on the same day

(e) Dig a hole (at least five times the size of the cutting rhizomes) and plant the rhizome either upright or at right angles to the slope. Carefully backfill the hole and firm the soil

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as much as possible.

(f) The Contractor is required to supervise all field operations very closely. The planting of bamboo is a delicate business and should be approached in the same way as the plant in go horticultural seedlings. The Contractor should employ experienced agricultural or forestry labourers for this work.

(g) Measurement and Payment:

The measurement shall be made in number of plants planted, counted and accepted by the engineer at site. The quantities measured shall be paid at the unit rates shown in the Bill of Quantities.

Add new Clause 2814 "Live Check Dam Construction" as follows:

2814 Live Check Dam Construction

(a) The cuttings should be at least 2000 mm long and 50-80 mm in diameter made from woody material that is 6 to 30 months old. The contractor is to collect the cuttings from local area and transport them from there wrapped in hessian jute. At all times, cuttings are to be kept moist and as cool as possible. Under any circumstances, all plants supplied must be planted the same day.

(b) Cuttings of the following species, if specified, should be a minimum of 2000 mm in length:
dabdabe(Garugapinnata),kavro(Ficuslacor),phaledo(Erythrinaspp)andGliricidiasepium.

(c) Spacing between check dams depends on the steepness of the gully slope and the profile of the floor. Live check dams should normally be at intervals of between three and five metres. Within check dams, cuttings should be about 30 to 50 mm apart.

(d) Live check dams should be constructed as given below, unless specified differently.

i. Make a hole deep and big enough to insert vertical hardwood cuttings of the largest size available. Use a crowbar if necessary to extend the hole.
ii. Insert the vertical cuttings by carefully pushing them into the hole and firming the soil around them. Try not to damage the bark. They should protrude about 300 mm above the ground surface.
iii. Place long hardwood cuttings on the uphill side of the vertical stakes.
iv. Backfill around the check dam and compact the soil.

(e) Measurement and Payment: The measurement shall be measured separately as per the accepted final product in linear metre. The quantities measured shall be paid at the unit rates shown in the Bill of Quantities.

Add new Clause 2815 "Measurement and Payment" as follows:

2815 Measurement and Payment

All the bioengineering items shall be measured in the respective units of the items of works specified in the Bill of Quantities (BoQ).

The payment of all the bio-engineering work items shall be made in two installments. First installment of 50% of the unit rate quoted in the BoQ shall be made after the completion of the works as per the Specifications and satisfaction to the Engineer. The second installment 50% of the unit rate quoted in

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the BoQ shall be made at the end of Defect Liability/Notification Period after carrying out the aftercare and maintenance of the bioengineering works that deem to be covered within the quoted rate, and acceptable to the Engineer.

Add new Clause 2816 "Priority on Bioengineering Works" as follows:

2816 Priority on Bio-engineering Works

The bioengineering works are very important to stabilize the side slopes. The Contractor shall require prioritizing the bioengineering works and stabilizing the side slopes before carrying out the bituminous works at the locations as instructed by the Engineer. In case of the bituminous works are carried out by the Contractor without carrying out the bioengineering works, and hence the bituminous works are damaged due to the slope failure in the absence of the bioengineering works, it is the responsibility of the Contractor to repair the bituminous works at his own cost. In no case, the Works shall be considered as completed unless the Contractor completes the bioengineering works to the satisfaction of the Engineer.

Section 2900-Maintenance of Roads

Delete Clause 2910 "Performance Based Maintenance of Roads" and Substitute by following:

2910 Performance Based Maintenance of Roads

2911 Performance Based Maintenance

(1) Description

This Section Performance Based Maintenance of Roads describes the works and services to be undertaken during Phase 2: Performance Based Maintenance Works.

The major objective of performance based maintenance works and services is to satisfy the road user with good accessibility, comfort, travel speed and safety, minimized the total system cost and environmental impacts and to ensure that the good physical condition of the road asset under contract over the entire period of the contract.

Major works of this project is Upgrading of Kamala - Bagmati section of East West Highway from Km 289+840 to Km 312+785.The performance based maintenance works is the one of the component of the whole works. After completion of the -Upgrading works the supervision consultant with consent of the Client will issue the Upgrading works completion certificate and then after the PBMC component will start.

For fulfillment of the above mentioned objectives the scope of works and services of PBCs may cover routine and recurrent maintenance or one or several of the other works and services involved in road network management and operation, improvement works, monsoon services, and emergency works.

In traditional road maintenance contracts, the Contractor is responsible for the execution of works which are normally defined by the Engineer, and the Contractor is paid on the basis of unit prices for different work items and quantities of works executed. In Performance Based Maintenance contracts, the Contractor is responsible to identify, plan and carry out the Works and Services to achieve and maintain the Service Levels (Management Service Levels and Operational Service Levels) specified in this Section. He will not receive instructions by the Employer and/or Engineer of what to do when, where and how as in traditional maintenance contracts, except for Emergency Works or Day Works.

The role of the Engineer, on behalf of the Employer, is to enforce the contract by verifying compliance with the agreed Service Levels and with all applicable legislation and regulations.

The Contractor will receive a Monthly Lump Sum Fee for the Performance Based Maintenance Works and Services. Payment reductions will be applied if the Contractor fails to comply with the Service Levels in any given month. Emergency Works are paid on unit price basis.

(2) Required Services

Two groups of services are required:

- Management Services; and
- Operational Services.

The management services include providing the information and data the Employer requires to

manage the road asset during the Maintenance Phase of the Contract and to facilitate either the next tendering process or handover to the Employer, such as:

- Information on how the Contractor assures the quality of his services, manages the health and safety of his staff, manages emergencies, and manages traffic at the worksite;
- Contractor's work programs and schedules;
- Regular work progress reports;
- Inventory and Road Register updates and other data sharing requirements;
- Maintenance history;
- Management of enquiries from third parties (public, police, etc.).

The operational services include the activities needed to maintain the satisfactory condition of the road assets, to assure their durability, as well as to satisfy the road users riding comfort requirement. These include, inter alia:

- Road and lane width
- Road roughness
- Scabbing
- Control of potholes and cracking
- Drainage
- Rutting
- Corrugation
- Visibility of road signs and markings
- Response times to rectify defects that compromise the safety of road users
- Vegetation control
- Littering control
- Edge break
- Depression
- Slickness/Bleeding
- Raveling
- Shoving
- Shoulder condition

(3) Contractor's Responsibilities

Besides the timely provision of management information to the Employer, the Contractor shall be responsible for defining, optimizing and carrying out in a timely manner the works which are needed to ensure the roads remain at or above the Operational Service Levels (It is minimum condition of road, bridge roadside and traffic asset that must be met by the contractor over the entire contract period, Clause 2914 of these Specifications) defined in the Contract. In doing this, the Contractor shall comply with local legislation, the Specifications, environmental and social regulations and the requirement of the World Bank's Environmental and Social Standards.

The Contractor shall set up a Self-Control Unit/Performance Monitoring Unit to observe road conditions and plan the various works needed to ensure the roads meet the defined Operational Service Levels. The Self-Control Unit/Performance Monitoring Unit will provide the Contractor with information on the Contractor's compliance with the Operational Service Levels, and data required to define and plan all works. Under the maintenance works and services, the Employer will not issue

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instructions to the Contractor regarding the types and volumes of works to be carried out but instead, the Contractor will decide what to do where, when, and how.

(4) Action by the Contractor

In PBC the maintenance work is not undertaken based on the instruction of the client. Instead, the Performance Monitoring Unit should be established within the organizational setup of the contractor to support the Contract Manager in gathering the information needed by the contractor to manage the works and services. The information gathered is used to prepare Monthly Statements and ensures that a complete database of the road condition, both on- and off-carriageway, is available at all times.

The contractor must establish the Performance Monitoring Unit after the award of the contract. The Self-Control/Performance Monitoring Unit is a team within the contractor's organization responsible for supervision of service levels

(a) Role of Self-Control/Performance Monitoring Unit

The contractor is obliged to establish within its organization a Self-Control/Performance Monitoring Unit PMU staffed with qualified personnel. The roles of the PMU are:

I. Self-inspection to verify the degree of compliance with the required service levels and preparation of PBC inspection record;

II. Patrol;

III. Assessment of the road;

IV. Generation and presentation of the information requested by the Road Manager for the documentation required for the monthly statement; and,

V. Formal Inspection together with Road Manager and Project Manager

Typical tasks of the Performance Monitoring Unit are shown in **Table 29.1**

Table29.1 Tasks of the Self-Control/Performance Monitoring Unit

Stage	Task	Report
Plan	Site condition assessment Development of Work Execution Plan	Report for site condition assessment of the road
Do	Data Collection/ Reporting Communication with the client Communication with road users	Daily Work Record Daily Patrol Record Photo Record Incident Report
Check	Self-inspection Formal and Ad hoc inspection Development of Draft Monthly Statement	Defect Detection and Rectification List Self-Inspection Result Report Draft Payment Reduction Calculation Table Draft Monthly Statement
Action	Remedy action to Non-compliance	Remedial work report

(b) Role of the Contract Manager

The roles of the Contract Manager include:

I. Drafting of Work Program including monitoring system;

II. Monthly formal inspection together with Project Manager;

III. Preparation of monthly statement; and,

IV. Coordinating the work of the PMU and the Execution/Maintenance Unit

(c) Role of the Execution/ Routine Maintenance Unit

The roles of the Execution/ Routine Maintenance Unit include:

I. Execution of works;

II. Quality control testing required for routine works and emergency works;

III. Progress control; and,3

IV. Executing Instructed (BoQ) works (if any)

(6) Definitions

In addition to the terms defined in the Conditions of Contract, the following words and expressions shall have the meanings stated.

"Day" means calendar day

"Emergency Work" means the works that are defined under Clause2916.

"End Date of Phase 2: Performance Based Maintenance Works" means the date on which the maintenance works were completed in accordance with the Contract as stated in the Taking- Over Certificate issued for Phase 2: Performance Based Maintenance Works.

"GPS" means Global Positioning System.

"Management Service Levels" means Service Levels associated with the Management Services.

"Maintenance Unit" means the Contractor crew dedicated to execute the maintenance works. This Unit shall also act as the initial response unit in case of any emergency.

"Maintenance Works" means all Works and Services required to comply with the Service Levels. This includes replacements of road assets, if necessary.

"MSL" means Management Service Levels.

"Self-Control/Performance Monitoring Unit" means the Contractor's dedicated personnel tasked among other things to evaluate and report on the condition of the road as well as plan the necessary maintenance and rectification works.

"Monthly Lump Sum" means the monthly rate per Kilometer of road payable to the Contractor for completed Maintenance Works, subject to reductions as provided in the Contract.

"Operational Service Level" means the level of usability of the road and its various assets as established by the prescribed allowable non-conformances, beyond which the road is considered as non-complying and requiring rectification works to be executed.

"OSL" means Operational Service Level.

"Phase 1" means the period for which the upgrading works of the road is to be executed by the Contractor under Phase 1: Upgrading Works.

"Phase 2" means the period for which the performance based maintenance works and services to be executed by the Contractor under Phase 2: Performance Based Maintenance Works.

"PRP" means Payment Reduction Point.

"Payment Reduction Point Value" means the monetary value of one PRP.

"Rainy Season" means generally the time between June 15 and September15.

"Road Assets" means all road related assets, including road furniture, within the right of way of the Kamala-Dhalkebar- Bagmati Road section of East – West Highway belonging to the Department of Roads.

"SL" means Service Level, a generic abbreviation for both OSL and MSL.

"Commencement Date of Phase 2" means the day immediately following the conclusion of the Defects Notification Period of the Phase 1: Upgrading Works.

"Works" means Works and Services

"Work Order" means an order issued by the Employer in response to the Contractor's proposal for the execution of works under Emergency Repair Works, which details the works required as well as the agreed time and cost.

2912 General

(1) Project Site

The project site is from Barahari Bazar bridge to Phuljor Km 289+840 to Km 312+785

of Kamala-Dhalkebar- Bagmati Section of East-West Highway.

Maintenance is to be provided for the road and all associated items for the full width of the road right of way and for any ancillary works outside the right of way such as drainage inlets and outlets, slope

and structure protection works etc. The area to be maintained includes the first 10 m length beyond the Right of Way of the side/approach roads.

(2) Scope of Services

The performance based maintenance works specified under this sub section shall cover the whole length from Km 289+840 to Km 312+785 after completion of DNP of the Contract within these chainages (Road and Bridge Contract). The Works to be provided by the Contractor include all managerial, administrative and physical activities that the Contractor needs to carryout, to comply with the Service Levels specified herein, or with any other requirements of the Contract. In particular, they include physical activities associated with the following road-related assets and items:

i. Paved areas of roads, parking areas, lay-bys, shoulders, approach roads footways and the like;

ii. Unpaved shoulders, medians, greenery areas and verges;

iii. Signs and signals, road markings and road safety furniture including bus and truck bays, bus stands, resting area;

iv. Road lighting and associated facilities;

v. Bridges, culverts, cross drainage, earth retaining structures and other structures;

vi. Surface and sub-surface Drainage ditches, pipes, manholes and related items;

vii. Slopes of cuttings and embankments;

viii. Landscaped and bio-engineering areas; and

ix. Other road assets, which have been constructed or installed during Phase1 and before that.

Management services include processes and procedures such as:

i. Assure the quality of the services;

ii. Manage the health and safety of the Contractor's personnel;

iii. Protect the environment;

iv. Manage emergencies;

v. Manage traffic at work sites, and

vi. Collect, manage and report on data specifically required by the Contract and in addition necessary for the effective management of the services

vii. Daily inspection patrols.

(3) Performance Criteria and Service Levels

The required condition of road assets is achieved by satisfying performance criteria designed to limit the presence of defects such as potholes and cracking in the pavement. Performance criteria are defined by Service Levels, which are the specified threshold for each of the performance criteria; for example, it may be specified that there shall be no pothole in excess of 150 mm in diameter or 50 mm deep and no crack shall be wider than 5 mm. The defined Service Levels are the accepted minimum thresholds for the quality levels of the road assets for which the Contractor is responsible.

Service Levels are specified in two categories:

a) Management Service Levels relating to the various management processes and procedures of the Contractor that deliver the Operational Service Levels, ensure good governance of the asset during the term of the Contract, provide information that the Employer concerning the delivery of the Works and facilitate the next tender round. They address matters such as:

   (i) Information on how the Contractor assures the quality of his services, manages the health and safety of his staff, protects the environment, manages monsoon period and emergencies, and manages traffic at worksites;

   (ii) Contractor's work schedule and programmes;

   (iii) Regular progress reports;

   (iv) Recording of network and inventory updates;

   (v) Recording of maintenance history; and

   (vi) Management of enquiries from third parties (public, police etc)

b) Operational Service Levels that are measures of the condition of the assets to assure their durability, to provide road user services and to ensure safe operation and comfort, such as:

   (i) Timely response to rectify defects that compromise the safety of road users;

   (ii) Repair of potholes and cracking;

   (iii) Repair of Rutting and other defects of the pavement;

   (iv) Maintenance of drainage systems;

   (v) Keeping road signs, signal and markings clean, visible and in good condition;

   (vi) Keep lighting equipment suitably visible and in good condition;

   (vii) Vegetation control, manage sight distance;

   (viii) Maintenance of structures;

   (ix) Safety Inspection; and

   (x) Litter control within Right of Way along the alignment.

For each performance criterion, a Service Level (SL) is specified. Throughout the contract period, if the Contractor fails to comply with an SL, reductions will be made from amounts due to the Contractor. The fundamental concept associated with such reductions is the Payment Reduction Point (PRP). Each SL breach attracts PRPs, which are accumulated and combined with the value of the individual PRP to evaluate the total reduction applicable.

(4) Monitoring of Performance

Under the terms of the contract, the Contractor shall also be responsible for the continuous monitoring and control of road conditions and Service Levels for the road or road sections included in the contract. This shall be necessary not only to fulfill the contract requirements, but the activity shall also provide the Contractor with the information needed to be able (i) to know the degree of his own compliance with Service Level requirements, and (ii) to define and plan, in a timely fashion, all physical interventions required to ensure that service quality indicators never fall below the indicated

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thresholds. The Contractor shall not receive instructions from the Employer concerning the type and volume of road maintenance works to be carried out. Instead, all initiative rests with the Contractor who shall do whatever is necessary and efficient to achieve the quality levels required.

Some emergency works are to be foreseen. Those are meant to remedy unexpected damage which occurs as a result of extraordinary natural phenomena, and which affect the normal use of the road network, or the safety and security of the users. For emergency works, the contract limits the responsibility of the Contractor, establishing that the Employer will approve execution of services and separate remuneration based on specific amounts proposed by the Contractor for each case, on the basis of volume of works estimated at each time and on unit prices included in the bid and in the contract.

2913 Management Services

Management Services are the various management processes and procedures of the Contractor that deliver the Operational Service Levels, ensure good stewardship of the road asset during the term of the Contract, provide information that the Employer requires concerning the delivery of the Services and facilitate the next tender round.

(1) Functions of Contractor's Key Personnel

During the Maintenance Phase of the Works, the Contractor's key personnel shall include but not be limited to the following key personnel whose duties are outlined below:

- **Contractor's representative / Contract Manager/Performance Manager:** shall act and represent the Contractor during the Phase 2 of the Contract. His duties and responsibilities include those discussed in the General Conditions of Contract. He/she shall also be responsible for the Self Control Unit and for the development and monitoring of the Program of Performance.
- **MaintenanceEngineer**shallinstructandsupervisetheworksundertakenonthesitebasedon the requirements of the Contract.

(2) Self-Control/Performance Monitoring Unit

The Contractor shall establish a Self-Control/Performance Monitoring Unit staffed by qualified personnel. The Self-Control/Performance Monitoring Unit staff shall:

- be responsible for maintaining at all times a detailed and complete knowledge of the condition of the roads included in the contract;
- provide to the Contractor's own management all the information needed in order to efficiently manage and maintain the roads included in the contract, without the SCU staff themselves having direct management responsibilities, or responsibilities for works execution;
- frequently patrol the roads included in the contract.
- prepare in a timely fashion the Monthly Compliance Tables for Maintenance Services and submit to Engineer at the end of the calendar month;
- carry out the Formal Inspections scheduled by the Engineer in accordance with the Operational Procedures;

- verify and audit the correct application by the Contractor's staff and subcontractors of the Contractor's Quality Assurance Plan and of all contractually required testing methods and other procedures related to the quality of works executed, and of materials used.

An experienced Civil Engineer (performance manager) shall be the head of the Self-Control Unit which shall be staffed with the adequate number of qualified engineers and/or technicians.

(3) Communication System

Not Applicable

(4) Site Regulations

The Contractor shall prepare Site Regulations setting out the rules to be observed in the execution of the Contract at the Site and shall comply therewith. Such Site regulations shall include, but shall not be limited to:

a) Safety;
b) Traffic control;
c) Accident, monsoon and Emergency response;
d) Dealing with third party enquiries and complaints;
e) Sanitation;
f) Medical care; and
g) Fire prevention.

The Site Regulations shall comply with the relevant laws and regulations of Nepal.

(5) Specifications and Work Methods

The Maintenance Works shall be executed in accordance with the Specifications and the Special Provisions for Performance Based Maintenance Works and/or any applicable Standards stated in the Specifications.

In case of conflict between the Specifications and Work Procedures defined in Phase 1 and the Service Levels or specifications of Phase2, the Service Levels and Work Procedures of Phase2 shall take precedence. If an ambiguity or discrepancy is found in the documents, the Engineer shall issue any necessary clarification or instruction.

With the prior written approval of the Employer, the Contractor may introduce new materials and work methods as long as they provide a better quality of work.

Under no circumstances shall the Contractor be entitled to any additional payment or relief from payment reduction due to the inadequacy of the materials and work procedures that he has proposed and employed in the Works and Services, notwithstanding any consent by the Employer to their use.

(6) Program of Performance

The Contractor shall develop, implement and maintain a Program of Performance, which shall set out in detail the management processes, procedures and controls that he will employ to deliver the Services and Works. The Program of Performance shall comprise the following components:

a) Operational Plan

The Operational Plan shall describe how the Contractor will undertake the Works to achieve the

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Service Levels, including but not limited to the following matters:

(i) Organizational structure for management and delivery of the Services;

(ii) Locations and coverage of depots and storage facilities;

(iii) Numbers, classification and deployment of equipment and personnel;

(iv) Provisions for procurement and storage of materials;

(v) Procedures for Safety Inspections and Service Level Inspections;

(vi) Procedures for Structural Inspections;

(vii) Procedures for routine maintenance and repair works;

(viii) Procedures for incident response and emergency works;

(ix) Procedures for response to third party enquiries, reports and complaints;

(x) Procedures for data collection, recording and storage.

b) Contractor's Quality Assurance Plan

The purpose of the Contractor's Quality Assurance Plan is to integrate the requirements of the Contract and the Contractor's quality assurance systems to deliver the Services.

The Quality Assurance Plan describes the methods and procedures, which the Contractor will apply for the execution of the Contract, including how the Contractor will:

(i) Identify the quality requirements specific to the Contract;

(ii) Plan and execute the Services and Works to satisfy those requirements;

(iii) Inspect and/or test work and materials to ensure compliance with the quality requirements;

(iv) Record and monitor the results as evidence of compliance;

(v) Ensure that prompt action is taken to correct non-compliance.

The Quality Assurance Plan shall comply with the principles of ISO 9001:2008 or any revision thereof. It shall clearly describe the systems, procedures and methods that will be used to deliver and monitor compliance of the Services.

c) Health and Safety Management Plan

The purpose of the Health and Safety Management Plan is to foster a responsible attitude towards occupational health and safety and to comply with the provisions of the Law of Nepal and the requirements of the World Bank's Environmental and Social Standards.

Because of the nature of the Services, the Contractor may occasionally be exposed to hazardous situations, which could involve risk of various degrees of harm, to the Contractor's personnel and/or the public.

Situations will arise when it is not practical to eliminate or isolate significant hazards. In these situations, the Contractor must mitigate hazards by ensuring planned protection systems (e.g. equipment, clothing) are available and used. The Contractor's personnel and all sub-contractors must comply with the Health and Safety Management Plan, including all types of pandemic at all times.

The Health and Safety Management Plan shall, when implemented in accordance with the plan requirements:

(i) Ensure the systematic identification of existing and new hazards on work site(s) and at depots, storage facilities, in offices or wherever activities are undertaken;

(ii) Ensure the mitigation of significant hazards, where elimination and isolation are impractical;

(iii) Ensure the provision and use of appropriate protective measures;

(iv) Include emergency procedures for dealing with accidental spillage, pollution or imminent danger;

(v) Ensure regular review and assessment of each hazard identified and monitor own staff and subcontractor's exposure to these hazards;

(vi) Ensure reporting and recording of work site safety incidents so health and safety problems can be addressed quickly and regularly. It is a requirement of this Contract that any such incident be advised promptly to the Engineer;

(vii) Comply with all other health and safety aspects requirements of Nepalese law and regulations.

d) Environmental and Social Management Plan

The purpose of the Environmental and Social Management Plan is to foster a responsible attitude to mitigating adverse environmental and social risks and impacts, occupational health and safety and shall comply with all applicable national, provincial and environmental laws and regulations of Nepal, as well as the Environmental Management Plan shall comply with ESIA and ESMP of the project road.

Because of the nature of the Services, the Contractor's operations have the potential to cause adverse environmental impacts. Situations will arise when it is not practical to avoid such impacts. In these situations, the impacts must be mitigated by planned actions and protection measures, which must be employed.

The Contractor's personnel and all sub-contractors shall comply with the Environmental Management Plan at all times.

The Environmental Management Plan shall, when implemented be in accordance with the plan requirements:

(i) The means by which the environmental management systems will be supervised, monitored and audited to ensure compliance with the principles and objectives of the ESMP at all times;

(ii) Carry out all of the monitoring and mitigation measures set forth in the ESMP prepared for the project.

(iii) Records to be prepared and maintained by Environmental Management staff and communication procedures to be followed so that the Employer and others associated with the Works (e.g. sub-Contractors) are kept fully informed on matters relating to the ESMP and applicable regulations throughout the Contract period;

(iv) Proposals to ensure that maintenance methods do not compromise the Contractor's commitment to the ESMP and compliance with all relevant statutory regulations;

(v) An organizational structure showing the appointed environmental management staff and the responsibilities of environmental protection participants;

(vi) The names, addresses, telephone and fax numbers of all participants;

(vii) The criteria used for the appointment of the principal staff;

(viii) The proposed interactions and communications procedures between the Contractor's personnel and the environmental protection staff, including proposals for the communications facilities to be provided. In particular, the establishment of a regular communications and reporting system;

(ix) The frequency, coverage and intent of environmental management meetings together with the rationale for attendance;

(x) Frequency, coverage and intent of regular environmental reports;

(xi) Methods proposed for promoting awareness of environmental protection issues among all personnel directly or indirectly associated with the maintenance works;

(xii) Provisions for storage of liquid, toxic and dust creating materials;

(xiii) Waste control and management;

(xiv) Materials handling;

(xv) Erosion prevention, including take care of planted grass, shrubs and trees;

(xvi) Dust Control;

(xvii) The powers vested in the environmental management staff that would enable them to take urgent, appropriate and direct action to prevent or correct environmental impacts;

(xviii) The means by which environmental management matters will be communicated to Sub-Contractors to ensure effective compliance by subcontractors.

e) Risk Management Plan

The Purpose of the Risk Management Plan is to ensure that uncertain events that may have adverse impacts on the integrity and condition of the road assets or on the Operational Service Levels are identified, analyzed and placed under a proactive management regime. The Risk Management Plan shall, as a minimum, include:

(i) Establishment of a risk register, in which all foreseeable adverse events are identified and assigned values of probability and consequence of occurrence;

(ii) Analysis of risks in which the impact of potential combinations of events is considered across a range of scenarios;

(iii) Identification of risk management strategies involving avoidance and mitigation of risks together with management strategies for residual risks;

(iv) Assignment of responsibility for risks to the organizations or individuals best able to manage them;

(v) A process for the regular review and updating of the risk register and the risk management plan.

f) Emergency Procedures and Contingency Plan

The Emergency Procedures and Contingency Plan shall establish the roles, practices and procedures to be followed during and following the occurrence of natural phenomena with imponderable consequences, such as strong storms, flooding and earthquakes. The Emergency Procedures and Contingency Plan shall be developed by the Contractor and agreed with the Engineer and any other stakeholders the Engineer may identify.

The purpose of the Emergency Procedures and Contingency Plan is to ensure the safety of the Contractor's personnel and road users in the case of emergency and/or road closure. It should include:

(i) An effective communication and event recording system;

(ii) The names, 24-hour contact telephone numbers and specific duties of the Contractor's personnel nominated to respond to an emergency event;

(iii) The contact telephone numbers of other parties who need to be notified in cases of emergency events, e.g. police;

(iv) Detailed response procedures for all potential emergency events;

(v) Possible detour routes in the event of road closure.

g) Traffic Management Plan

The Traffic Management Plan establishes the practices for traffic management at work sites and shall comply with the relevant rules and regulations in Nepal. The Traffic Management Plan must be developed by the Contractor and agreed with the Engineer.

The objectives of the Traffic Management Plan are to:

(i) Clearly define and document the responsibilities and chain of command for the development, implementation and management of traffic control measures and systems,

(ii) Establish the minimum requirements for temporary traffic control,

(iii) Establish the minimum geometric, cross section and surfacing standards for temporary works,

(iv) Provide appropriate transitions and enable safe and efficient traffic flow into, through and out of work sites,

(v) Protect the Contractor's personnel at all times,

(vi) Protect the Road and related assets and the Contractor's resources at all times, and

(vii) Meet the operational requirements for the Road.

The Traffic Management Plan must include at least the following:

(i) A documented process for preparation, review and approval of the Traffic Management Plan;

(ii) A document tracking and control system to ensure that only the latest operative copy of the Traffic Management Plan is in circulation;

(iii) 24-hour contact telephone numbers for Contractor, Engineer, Employer, emergency services and other stakeholders; and

(iv) Layout diagrams, method statements, etc. for implementation of traffic control while

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undertaking each aspect of the Services (including site specific layout diagrams and method statements if the Services require traffic control measures not covered by standard codes of practice.

h) Road Management Database

Data about the conditions of the road assets being maintained under this Contract are required for current and future reference. The Contractor shall prepare and maintain a road management database of accuracy and completeness appropriate to the uses for which it is intended, which shall be kept current at all times. The Contractor shall supply all information necessary to prepare and maintain this data. The following information is to be collected and updated:

- Road and bridge inventory and treatment history;
- Road condition and section rating;
- Traffic and classification details;
- Maintenance history.

The Contractor shall undertake whatever actions may be necessary including detailed road condition surveys to obtain the above data and all information required to maintain the road management database.

The Contractor shall provide hard and electronic copies of the updated road management database and all relevant information to the Employer. Report and subsequent updates shall be submitted every three months thereafter together with the relevant monthly progress report.

8) Daily Inspections

The Contractor shall undertake Inspections of all lengths of road in both directions for which he is responsible on at least a daily basis to ensure the continuous safe operation of the roads and the compliance of all road related assets with the Operational Service Levels.

The procedures for Inspections shall be described in detail in the Contractor's Operational Plan. The Daily Inspection shall as a minimum record the following information:

(i) Date and time of inspection at start and end of each of each day and the route covered;

(ii) Weather;

(iii) Route of inspection;

(iv) Summary of general operating conditions;

(v) Recording of all non-compliances with Operational Service Levels detected;

(vi) Incidents, hazards and defects discovered and actions taken;

(vii) Record of interactions with:

- Police
- Engineer's staff
- Official bodies
- Members of the public

9) Inspection of Structures

All bridges and all culverts with span in excess of three(3) metres together with all earth retaining structures with a height in excess of three(3) metres and other significant structures shall be visually inspected at least once in each calendar month to ensure that they are in a safe operating condition.

This inspection shall record:

(i) Vehicular damage to structures;

(ii) Scour of foundations in watercourses and erosion of protective structures such as revetments, gabions and the like;

(iii) Settlement of foundations, movement or rotation of abutments, wing walls and earth retaining structures;

(iv) Significant corrosion of steel reinforcement in reinforced concrete members causing spalling of concrete;

(v) New or worsened deflection or cracking of reinforced concrete members;

(vi) Corrosion of structural steelwork with significant loss of metal.

(vii) Anything else that impairs the safe operating condition of the bridge.

Where defects appear to be worsening rapidly, the Contractor shall inform the Engineer without delay and shall take appropriate measures to ensure the safety of road users and employees.

Any non-compliance with the Operational Service Levels discovered during any inspection shall be recorded. The record of each defect shall include an accurate positional reference, description and dimensions of the defect and a photograph taken with a digital camera and bearing a date and time stamp. The record of each inspection shall be recorded. Upon completion of remedial works for each defect or group of defects, the record of works together with a further date and time stamped photograph shall be recorded as well and included in the Monthly Report.

10) Reporting

a) Inception Report

Within 28 days after the Commencement Date of Phase 2, the Contractor shall submit an inception report to the Employer. The report shall include the following:

- Initial condition survey
- Video survey
- Roughness survey
- Initial road management database
- Detailed maintenance program for the first 3 months
- Information regarding environmental, safety and social issues and other information as may be necessary

The Contractor's initial condition survey of the roads, structures and other appurtenances shall be attended by the Engineer. The detailed results of the survey shall be recorded by the Contractor and submitted to the Engineer for confirmation.

The initial condition survey will establish a baseline of road conditions at the time of commencement of the Phase 2. The video survey shall be undertaken during daylight hours from the passenger's

seat of a slow moving vehicle with the camera aligned towards the center of the road. Video shall also be taken of all bridges, major culverts and any other major structures to show the conditions of each structure from all angles. The Contractor shall complete and formally submit to the Engineer two copies of the video record on Portable Drive.

The roughness data is required to establish the actual roughness condition of the road at the time of commencement of the Phase 2. Roughness shall be measured using a method and equipment approved by the Engineer.

The environmental, safety and social surveys shall establish the issues existing prior to the commencement of Phase 2.

The Employer shall confirm the accuracy of the initial condition survey within 21 days of his receipt of the inception report. The Engineer's opinion on the condition of any road asset or any item shall be final.

Interim Payment Certificates will not be released until such time as the inception report is approved by the Employer with recommendation of the Engineer.

b) Weekly Report to be submitted to the Employer

The Contractor shall prepare and submit weekly reports to the Engineer on all inspections, incidents, non-compliance with Operational Service Levels detected, remedial actions taken and other works executed by the Contractor. The format and the information to be supplied shall have to be approved by the Engineer. As a minimum information in weekly report shall be:

(i) Weather of each day of the week

(ii) Summary of general operating conditions

(iii) Recording of all non-compliances with Operational Service Levels detected

(iv) Record of maintenance activities

(v) Incidents, hazards and defects discovered and actions taken

(vi) Record of interactions with:
   a. Police
   b. Engineer's staff
   c. Official bodies
   d. Members of the public

The information provided in the weekly reports shall be summarized by the Contractor and included in the relevant sections of his Monthly Reports.

c) Monthly Reports

The Monthly Report shall be submitted by the Contractor to the Engineer each month no later than the seventh calendar day of the following month; except for the reports under (ii) and (iii) below, which shall be submitted on the last working day of the respective month; shall comprise the following components:

(i) Narrative Report, describing Services and Works undertaken during the period, problems and issues arising and measures taken to deal with them;

(ii) Contractor's Monthly Operational Service Level Inspection Report;

(iii) Monthly Evaluation Form for Compliance with Operational Service Levels;

(iv) Memorandum of Non- Compliance with Operational Service Levels – based on the Monthly Formal Inspections;

(v) Memorandum of Non-Compliance with Operational Service Levels – based on Informal Inspections;

(vi) Report on all Maintenance Works and Services;

(vii) Report on any Emergency Works or other Works instructed by the Engineer due to defects to be repaired under the Defects Notification Period liabilities;

(viii) Report on Testing under taken in accordance with the Contractor's Quality Assurance Plan or as required by the Engineer. Tests shall be undertaken in accordance with the specifications and appropriate standards and the detailed test results shall be submitted to the Engineer in the respective month;

(ix) Structural Inspection Reports on inspections undertaken. First inspection reports shall be provided within two (2) calendar months of the Commencement Date of Phase2;

(x) Summary of Incident Reports shall be submitted for each month (or a nil return);

(xi) Updated Monthly Work Program, detailing the location, timing and extent of all works the Contractor proposes to complete during the next month;

(xii) Any other information as the Engineer may require from time totime.

d) Incident Reports

Every occurrence of an Emergency that requires "Emergency Works" as defined in Section 2916 Emergency Works below shall be reported to the Engineer as described below:

(i) Any road closer should be reported within one (1) hour of discovery and road closer report should be submitted after twenty-four (24) hours of road re-opened;

(ii) Landslides, defined as movement of earth or rocks encroaching on any carriageway or shoulder or blocking any drainage system or watercourse; reported without delay and in any event within one (1) hour of discovery;

(iii) Flooding, defined as large volumes of water occupying all or parts of the roadway, shoulders and adjoining areas; reported without delay and in any event within one(1) hour of discovery;

(iv) Any other event where the Contractor proposes to request issue by the Employer of an Emergency Work Order; reported without delay and in any event within one (1) hour of discovery;

(v) Road Accidents involving injury to people, significant vehicular damage and/or damage to the road surface, structures or road furniture; without delay and in any event within twenty-four (24) hours of discovery;

(vi) Other Damage, including vandalism, theft, damage of highway furniture and structures; reported weekly.

Incident reports shall include:

(i) The precise location, timing and extent of the incident, supported by maps/plans and date/time stamped digital photographs;

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(ii) A brief narrative description of the circumstances.

(iii) Where applicable, the names of the people and/or organizations responsible for causing the damage. This information is required so that the Employer may seek recovery of the costs associated with repairing the damage.

Copies of incident reports shall be included in the monthly reports.

e) Handover Report

No later than two (2) months prior to the Date of Completion of the Contract the Contractor shall submit the Handover Report in draft to the Engineer. The purpose of the Handover Report is to provide a smooth transition to the next contract and ensure that the next Contractor is aware of any outstanding issues.

The Report shall:

(a) Summarize any unresolved issues,

(b) Include the most recent complete set of data on the Road and related assets included in the Contract; and

(c) Provide the following details:

i. The current and up-to-date Program of Performance including all sections and particularly the updated risk register;

ii. A schedule of outstanding defects and liabilities;

iii. Any unresolved issues, especially those that may impact on the next Contractor;

iv. Details of any sensitive issues;

v. Any on-going special monitoring/maintenance needs.

The final Handover report shall be submitted no later than 14 days prior to the Date of Completion of Phase 2.

11) Management Service Levels

Table 29.2 lists Management Service Levels (MSL), which relate to the overall management of the Works along with the corresponding Submission Dates and resulting PRPs for each MSL.

The Management Services cease on the Date of Completion of the Contract. If any requirements are unfulfilled at that time, the Employer and/or Engineer may procure their completion and recover the cost thereof from amounts due to the Contractor.

The Management Service Level Number (see MSL No column in Table 29.2) comprises a section reference to one of the sections above followed by a count within that section.

(i) Table 29.2 – Required Submission Dates and Payment Reduction Points for Management Service Levels.

Table 29.2Required Submission Dates and Payment Reduction Points for Management Service Levels

Management Services	MSL No	Action	Submission Dates	Payment Reduction Point
Key Personnel	1	Key Personnel appointed, approved by the Engineer and on the site	At the commencement Date of Phase 2	**5 points** per day
Self-Control Unit	2	Self-Control Unit fully established	At the Commencement Date of Phase 2	**5 points** per day
Site Regulations.	3 (1)	Draft Site Regulations submitted to the Engineer, for approval, which shall not be unreasonably withheld.	At the Commencement Date of Phase 2	**4 points** per day
	3 (2)	Engineer either issues a notification of approval of the draft Site Regulations or notifies the Contractor that they are not approved, stating the specific reasons for rejection.	Within 14 days after submission of draft Site Regulations	N/A
	3 (3)	Contractor submits revised draft Site Regulations	Within a further 7 days of Engineer's notification	**3 points** per day
	3 (4)	Contractor implements Site Regulations and remedies breaches forthwith	N/A	**2 points** during the first week, **4 points** during the second week and **1point**per day thereafter until the deficiency is remedied
Program of Performance	5 (1)	Contractor's Program of Performance submitted in draft	At the Commencement Date of Phase 2	**4 points** per day
	5 (2)	Engineer either issues a notification of "no objection" to the Plan or notifies the Contractor that his Programme of Performance fails to comply with the Contract, stating the specific areas of "non-compliance"	Within 14 days after submission of Programme of Performance	N/A

Management Services	MSL No	Action	Submission Dates	Payment Reduction Point
	5 (3)	Contractor submits a revised Program of Performance	Within a further 7 days of Engineer's notification	**3 points** per day
	5 (5)	Contractor updates Road Management Data Base	Every six months together with the relevant Monthly Report	**1 points** per day
	5 (6)	Contractor updates Programme of Performance annually or upon the occurrence of any material change to any of the constituent processes and procedures or upon the reasonable request of the Engineer and submits to Engineer	Within 14 days of each anniversary of the Commencement Date of Phase 2 or upon the occurrence of any material change to any of the constituent processes and procedures or upon the reasonable request of the Engineer	**4 points** per day
Inspection of Structures	7 (1)	Contractor inspects all bridges and all culverts with span or diameter in excess of three (3) meters together with all earth retaining structures with a length in excess of 3 m and other significant structures at every six months to ensure that they are in a safe operating condition	As per Operational Plan	As per Program of Performance
Inception Report	8a	Submission of Inception Report	28 days after the Commencement Date of Phase 2	**2 points** per day
Weekly Reports	8b	Submission of weekly Report	By the end of the following week	**2 points** per day
Monthly Report	8c	Contractor submits the Monthly Report to the Engineer	No later than the 7th calendar day of the following month (starting with the report on the first month after the Commencement Date of Phase 2)	**3 points** per day

Management Services	MSL No	Action	Submission Dates	Payment Reduction Point
Incident reports	8d	(i) Landslides, defined as movement of earth, rocks or debris encroaching on any carriageway reported without delay. (ii) Flooding, defined as large volumes of water occupying all or parts of the roadway, shoulders and adjoining areas; reported without delay. (iii) Any other event where the Contractor proposes to request issue by the Engineer/Employer of an Emergency Work Order; reported without delay.	Within two hour of discovery	**3 points** per hour
		(iv) Road Accidents involving injury to people, significant vehicular damage and/or damage to the road surface, structures or road furniture without delay.	Within twenty-four (24) hours of discovery.	**2 points** per day
Handover Report	8e (1)	Contractor submits draft Handover Report to the Engineer.	Within two months prior to the Date of Completion of the Contract	**10 points** per day
	8e (2)	Engineer either accepts the report or notifies the Contractor of any inaccuracies or other inadequacy of the report.	Within 14 days after submission of the Handover Report	N/A
	8b (3)	Contractor submits final Handover Report, in which the comments of the Engineer are addressed and the report updated with any changes in the information contained in	One day prior to the Completion of the Contract	**15 points** per day

Management Services	MSL No	Action	Submission Dates	Payment Reduction Point
		therein.		

2914 Operational Services

The operational services include the activities needed to maintain the satisfactory condition of the road assets, to assure their durability, as well as to satisfy the road users riding comfort requirement.

1. Operational Services consist of all interventions on the Roads and their right-of-way that are to be carried out on a regular or occasional basis by the Contractor in order to attain and maintain the defined Service Levels for the roads included in the contract. They also include numerous required and necessary activities related to the management and patrolling of the roads included in the Contract, throughout the entire contract duration.

Operational services include (but are not limited to) the following:

- Repairing road defects (such as potholes, rutting, raveling, cracking in pavement, edge break, etc.);
- Maintenance of shoulders, verge, intersections, junctions with other roads, roundabouts, overpasses and other road surface areas;
- Repair works in embankment and cut slopes;
- Drainage system cleaning, maintenance, and repairs;
- Maintenance of bridges and other structures (such as retaining walls, culverts, etc.);
- Road cleaning and removal of trash and debris;
- Vegetation control (cutting vegetation);
- Maintenance of existing vegetation, such as trees (if required);
- Cleaning and maintenance of road signs and road markings, including their replacement needed due to wear and tear, minor damages, etc.;
- Maintaining traffic flows and road safety during Works carried out on the roads;
- Regular patrolling of the roads in line with the requirements;
- Establishing and operating the Contractor's Self-Control Unit;
- Road condition data collection and monthly reporting;
- Other types of reporting as required by the Contract;
- Providing assistance to road users in emergency situations resulting from traffic accidents or incidents, extreme weather events, natural disaster, etc.

2. **Categories of Operational Service Levels:**

There are 3 Categories of Operational Service Levels:

a) Operational Service Levels Category A: They are the ones that are considered very important and critical and need to be rectified within a short period as given in table 29.3.

b) Operational Service Levels Category B: They are considered less critical. Although the Contractor is required to frequently control that these OSL are complied with, they will attract Payment Reduction Points as given in table 29.4 only if they are not complied and detected during the Joint Monthly Inspection.

c) Operational Service Levels Category C: They are controlled only once per year as given in table 29.5.

For each of the 3 Categories of Operational Service Levels the OSL number, the Item, the Operational Service Level and the Payment Reduction Points, Inspection methods etc are specified as well as described in table 29.3, 29.4 and 29.5.

3. Operational Service Levels Category A

Note:

a. Payment Reduction Points (PRP) is applicable for each one km section between two adjacent kilometer posts, unless specified otherwise for an Operation Service Level (OSL).

b. *The value of each Payment Reduction Point (PRP) is given in* ***Sub-Clause 14.16 of Particular Condition of Contract, Part B - Special Provision****.*

Table 29.3: Operational Service Level for Category A

OSL No.	OSL Description	Method of Inspection	Payment Reduction Points (PRP) (*Note: PRP is applicable for each one Km section, unless otherwise specified for an OSL*)	Rectification Period
OSL-A.1	**Usability (Availability of each lane-km for use by traffic)** The Contractor must ensure that the road with all its traffic lanes and other lanes is open to traffic and free of interruptions at all times. Permitted exceptions are: • Lane closures following serious traffic accidents (not exceeding 4 hours after release of the accident site by Traffic Police); • Lane closures due to vehicle breakdown • Restrictions on traffic flow needed to carry out scheduled works on the road by the Contractor; • Natural disasters; and • Lane or road closures resulting from the direct instructions of the Traffic Police or other relevant authorities, in circumstances which are not the responsibility of the Contractor.	By driving on the road in a normal manner, utilizing a vehicle type that is similar to the vehicles typically used by road users. This requirement is not complied with if one or more traffic lanes are partially or fully interrupted or blocked at any point. The requirement is complied with if the road with all its travel and turning lanes is fully open to traffic and usable as designed.	• **If all travel lanes of the road are interrupted: Five (5) points** for each two-hour period of non-compliance. • **If one or more travel lanes are interrupted, but at least one lane remains:Two (2) points** for each two-hour period of non-compliance.	Not Applicable
OSL-A.2	**Pavement defects (potholes, cleanliness, etc.)**			
A.2.1	**Potholes** • Potholes (Max. allowed Diameter of any single pothole: 200 mm and Max. allowed depth of any pothole: 40 mm);	Visual inspection. Measuring shall be made by using a tape measure, ruler or straightedge, transparent ruler or calibrated steel probe.	**3 points**(to be applied for each one km section that does not comply and for each day during which the non-compliance persists)	14 days (for technically appropriate repairs (patching) to be carried out in line with Specifications or good

OSL No.	OSL Description	Method of Inspection	Payment Reduction Points (PRP) (*Note: PRP is applicable for each one Km section, unless otherwise specified for an OSL*)	Rectification Period
	• Potholes (Max. number in any one (1) km section, with a diameter greater than 120 mm): 6;			international practices. However, since potholes also affect road safety, the Contractor is obliged to fill potholes at least temporarily with Cold Mix or other materials approved by the Engineer, within 48 hours of their detection.
A.2.2	**Cleanliness of the pavement, shoulders, and Right-of-Way** *Cleanliness* refers to the *absence* of soil, debris, trash, rubbish, dead animals and other such objects. The terms "*cleanliness*" and "*absence*" are defined further below for the purposes of the contract. The requirement is that the **road and shoulder surface** must always be "clean".	Visual Inspection	**3 points** (to be applied for each one km section that does not comply and for each day during which the non-compliance persists)	No Rectification Period when unclean conditions present a **safety risk**. To be cleaned during patrol.

	Cleanliness* of the **pavement surface and shoulders** when unclean conditions present a **safety risk.** (Patrol in line with required patrol frequency) - To be cleaned during patrol. No Rectification Period. Cleanliness* of the **pavement surface and shoulders** when there are no safety risks. *Absence* of trash/rubbish **from the road's Right-of-Way**,** outside the pavement and shoulder surface. *Definition of "*Cleanliness of pavement surface and shoulder",* **for rural areas**: The maximum number of items on the sealed surface and shoulders, with any dimension greater than 100mm (or smaller if posing an obvious safety hazard) within a continuous 100-meter centreline length shall be less than 5 (five). *Definition of "*Cleanliness of pavement surface and shoulders",* **for built-up or populated areas**: The maximum number of items on the sealed surface and shoulders, with any dimension greater than 100 mm (or smaller if posing an obvious safety hazard) within a continuous 100-meter centreline length shall be less than 10 (ten). **Definition of *"Absence from the Road's Right-of-Way":* The maximum number of clearly visible items on the surface of the			48 hrs when there are no safety risks. 28 days

OSL No.	OSL Description	Method of Inspection	Payment Reduction Points (PRP) (*Note: PRP is applicable for each one Km section, unless otherwise specified for an OSL*)	Rectification Period
	Right-of-Way, on each side of the carriageway(s) and additional 3 meters away from the edge of the sealed shoulder, with any dimension greater than 200 mm, shall be less than 20 (twenty) within any continuous 100 meter center line length of the road.			
A.2.3	**Emergency removal of slides-** Slides of slope material onto the road are considered an Emergency if the quantity of the material slipped (in m3) in any one occurrence or event is above the threshold of 50 m3 per consecutive Kilometre Posts. If below threshold, removal is part of general maintenance obligations **(If the Contractor intends to invoke the contract provisions for Emergency Works, he must estimate the quantities and immediately inform the Engineer to get the Work Order)**	Visual Inspection for fallen slope material on shoulders or pavement.	**5 points** (to be applied for each one km section that does not comply and for each day during which the non-compliance persists)	Traffic flow to be re-established within a maximum of 6 hours, unless stipulated differently in Emergency Work Order. Period for removal of slide material is set by Engineer in Emergency Work Order.
A.2.4	**Removal of slides (not classified as Emergency)-** Fallen slope material must be removed (Visual Inspection for fallen slope material on shoulders or pavement)- Fallen slope material must be removed.	Visual Inspection for fallen slope material on shoulders or pavement.	**5 points** (to be applied for each one km section that does not comply and for each day during which the non-compliance persists)	For quantities below 50 m3: from pavement within 3 hours after detection; from shoulders and side drains within 48 hours after detection.
A.2.5	**Oil Spills on Pavements-** No oil spills more than 2 sq.m. shall be allowed at any location on pavement surface.	Visual	**5 points** (to be applied for each 100 m section that does not comply and for each day during which the non-compliance persists)	Oil spills shall be removed within 6 hours of detection.

OSL No.	OSL Description	Method of Inspection	Payment Reduction Points (PRP) (*Note: PRP is applicable for each one Km section, unless otherwise specified for an OSL*)	Rectification Period
OSL – A.3	**Drainage Inlet , Outlet, Drainage Pipe, Catch basin** Contractor ensure that no more than 25% of flow area or cross section is blocked during **rainy season**	The percentage of obstruction is calculated for each type of drainage element, based on the measurement or estimate of obstructed cross-section areas.	**3 points** per structure	48 hours

4. Operational Service Levels Category B

Note:

a. Payment Reduction Points (PRP) is applicable for each one km section between two adjacent kilometer posts, unless specified otherwise for an Operation Service Level (OSL).

b. The value of each Payment Reduction Point (PRP) is given in **Particular Condition of Contract Sub-Clause 14.16.**

Table 29.4: Operational Service Category B

OSL No.	OSL Description	Method of Inspection	Payment Reduction Points (PRP) (*Note: PRP is applicable for each one Km section, unless otherwise specified for an OSL*)	Remarks
OSL-B.1 OSB-B.1.1	**Drainage:** The Contractor must ensure that all drainage elements are structurally sound, clean and without obstructions (due to sediment or debris) which may reduce their normal cross-section and impede the free flow of water. The basic principle used to determine the cleanliness of drainage structures or devices is "the percentage of the theoretical cross-section of the structure or device which is obstructed". The obstructed percentage shall not exceed 20% of the theoretical cross-section. Also, erosion caused by runoff from drainage elements must be mitigated in order for (i) the structure itself to be protected against future structural failure and (ii) to avoid any significant damage and erosion to adjacent areas. Drainage elements include (but are not limited to), culverts,	Inspection is done visually to detect obstructions or defects. The percentage of obstruction is calculated for each type of drainage element, based on the measurement or estimate of obstructed cross-section areas. Compliance requires that drainage fulfils the requirements stated above. Determination of structural soundness is based solely on the judgment of the Engineer.	**1 pointfor each** culverts, manholes, catch pits, flumes and outlets to subsoil drains.	

OSL No.	OSL Description	Method of Inspection	Payment Reduction Points (PRP) (*Note: PRP is applicable for each one Km section, unless otherwise specified for an OSL*)	Remarks
	manholes, catch pits, flumes and outlets to subsoil drains.			
OSL-B.1.2	Side drains Maximum area of obstructed cross-section at any point: 20%	Inspection is done visually to detect obstructions or defects. The percentage of obstruction is calculated based on the measurement by tape.	**1 point** per continuous 50 m of drains.	
OSL-B.2 **OSL-B.2.1**	**Pavement Defects:** **Patching:** Patching is the mandatory repair method for many different pavement defects. Patches (i) shall be square or rectangular, (ii) must have squared edges cut with a blade or a similar tool, (iii) shall be level with the surrounding pavement, (iv) shall be made using materials similar to those used for the surrounding pavement, and (v) shall not have cracks wider than three (3) mm.	Patches shall have a smooth and regular surface, flush with the surrounding road surface. When checking with a straightedge extending across the surface of the patch in any direction, there shall be no deviation from the lower edge of the straightedge of more than 5 mm. Methods and equipment used for inspection: • Visual inspection (for detection of shape and materials used); • Straightedge (for patch evenness); • Ruler (to check if patch is level with surrounding pavement); and	**1 point** per patch	

OSL No.	OSL Description	Method of Inspection	Payment Reduction Points (PRP) (*Note: PRP is applicable for each one Km section, unless otherwise specified for an OSL*)	Remarks
		• Small transparent ruler (for measuring cracks).		
OSL-B.2.2	**Isolated cracking in pavement:** An isolated crack is defined as a linear opening in the pavement with a width of more than three (3) mm, such as longitudinal cracks, transverse cracks and edge cracks. The Contractor is obliged to seal all linear isolated cracks wider than three (3) mm. Sealing must be preceded by routing of the crack (if needed) and cleaning to ensure adherence of sealant material. The seal must ensure that water cannot enter the road structure through the crack **Maximum width of unsealed cracks 3 mm wide must not exist 10m aggregated length per 100 m length of double lane roadway**	Crack widths are measured with a small transparent ruler.	**2 points**	

OSL No.	OSL Description	Method of Inspection	Payment Reduction Points (PRP) (*Note: PRP is applicable for each one Km section, unless otherwise specified for an OSL*)	Remarks
OSL-B.2.3	**Multiple cracks in the pavement:** This applies in cases of multiple visible cracks (such as alligator cracks, or block cracking, or cracks crossing each other). For multiple cracks, the "cracked area" is equivalent to a square or rectangle, parallel to the traffic lanes, which fully encloses the cracks, and where the closest crack is at least 0.25 m away from the sides of the square. The requirement is as follows: The cracked areas shall not exceed ten (10) percent of any 50-meter section of road. Cracked areas exceeding 10 percent of any 50-meter road section must be repaired, with the Contractor proposing the repair method to the Engineer for approval. Repair methods are: (i) patching, with or without repair of underlying pavement layers, or (ii) applying a seal coat to the entire cracked area, or (iii) sealing of the individual cracks. For all repair methods, the repair must ensure that water cannot enter the road structure through the repaired area.	Detection of multiple cracks by visual inspection. Measurement of cracked areas by measuring tape, handheld measuring wheels or other appropriate measuring devices. The "cracked area" is equivalent to a square or rectangular area, parallel to the traffic lanes, which fully encloses the cracked area.	**2 points**	

OSL No.	OSL Description	Method of Inspection	Payment Reduction Points (PRP) (*Note: PRP is applicable for each one Km section, unless otherwise specified for an OSL*)	Remarks
	For any 50-meter section of the pavement, the cracked area shall not be more than ten (10) percent of the pavement surface. Repairs must be performed as per the requirements.			
OSL-B.2.4	**Rutting:** Max. allowed Rutting depth 25mm Max. allowed Rutting 5% of any one –km length	Measured with one ruler and one straightedge. Straightedge of three (3) meters length placed horizontally and perpendicularly across lane. Rut depth is measured as the space between the lower edge of straightedge and the lowest point of rut, using a small ruler with scale in mm.	**2 points**	
OSL-B.2.5	**Raveling of pavements:** The maximum surface area of ravelling with in any continuous on-km centreline length shall be less than two (2) percent.	Detection of Ravelling by visual inspection. Measurement of ravelled areas by measuring tape, handheld measuring wheels or other appropriate measuring devices. The "ravelled area" is equivalent to a square or rectangular area, parallel to the traffic lanes, which fully encloses the ravelling.	**3 points**	
OSL-B.2.7	**Loose pavement edges:**	Visual inspection and measurement by tape.	**3 points**	

OSL No.	OSL Description	Method of Inspection	Payment Reduction Points (PRP) (*Note: PRP is applicable for each one Km section, unless otherwise specified for an OSL*)	Remarks
	There shall not be loose pavement edges, or pieces of pavement breaking off at the edges. A one-km section is non-compliant if pavement edges are loose or broken off for a combined length of more than 5 meters.			
OSL-B.3	**Paved Shoulders:** The criteria of OSL-B.2 (Pavement Defects) also apply for paved shoulders. In addition, paved shoulders shall always be adequately sealed to prevent water penetration, without deformations or erosions in excess of 15mm under a 3-meter straightedge in any direction.		**3 points**	
OSL-B.4 **OSL-B.4.1** **OSL-B.4.2**	<u>Bridges:</u> Road surface, kerbs, guard rails and barriers must be in sound condition. Guardrails on bridges and access ramps must be painted or galvanized, and not deformed. More than 90% of each expansion joint shall be clean, without major damage and shall not pose any hazard to vehicle. Contractor must ensure free flow of water under bridges and a clear, unobstructed	Visual inspection Visual Inspection Visual Inspection	**1 point per bridge** **1 points per bridge**	

OSL No.	OSL Description	Method of Inspection	Payment Reduction Points (PRP) (*Note: PRP is applicable for each one Km section, unless otherwise specified for an OSL*)	Remarks
OSL-B.4.3	channel at least equal to the structure opening for at least 50 meters upstream and downstream. Contractor must maintain design clearance under bridge.		**1 per bridge**	
	Concrete Beams and all other structural parts must be in good conditions and fully functional. Minor and non-structural repairs must be carried out by Contractor as part of his normal Maintenance Services.	Visual Inspection	**2 points**	The Contractor shall immediately inform the Engineer for any erosion around bridge abutments, piers, abutments protection and river training structures which maintenance will be carried under Emergency Work.
OSL-B.4.4	There should be always smooth transition from approach road to bridge and from bridge to approach road. The level difference of approach road at within 1 m. distance from the end of bridge and bridge deck must not be greater than 15 mm.	Straightedge and ruler	**2 points**	Minor repair is contractor's responsibility. Structural damage to be notify to Engineer immediately.

OSL No.	OSL Description	Method of Inspection	Payment Reduction Points (PRP) (*Note: PRP is applicable for each one Km section, unless otherwise specified for an OSL*)	Remarks
OSL-B.4.5				
OSL-B.5 **OSL-B.5.1** **OSL-B.5.2**	**<u>Embankments, Slopes and Retaining walls:</u>** Cut and Embankment slopes: 90% of area shall be stable and without deformations and erosions Retaining Walls: Contractor must ensure adequate condition of 90% of their drainage.	Visual inspection Visual inspection	**2 points** **2 points**	
OSL-B.6 **OSL-B.6.1**	**Road Signs, Line-marking and Road Furniture** **Regularity, Warning, Information Signs and Hazard markers:** All signs as per drawings are in place, uniform intensity, clean, clearly visible day and night.	Visual Inspection	**1 points per item**	
OSL-B.6.2	**Road Markings:** Have to be present, clearly legible during day and night, and firmly attached to the	Visual Inspection and tape measurement	**2 points per 100 m length**	

OSL No.	OSL Description	Method of Inspection	Payment Reduction Points (PRP) (*Note: PRP is applicable for each one Km section, unless otherwise specified for an OSL*)	Remarks
	pavement. Maximum length of damaged or missing edge or centerline marking: 15 m per 100 m of road			
OSL-B.6.3	**Delineators and additional road furniture:** Have to be present, clean, structurally sound, firmly attached to the surface and clearly visible day and night.	Visual Inspection	**1 points per item**	
OSL-B.6.4	**Mileposts, guidance posts and similar markers:** Have to be present, visible, complete, clean, legible and structurally sound; surface painted or otherwise covered.	Visual Inspection	**1 points per item**	
OSL-B.6.5	**Crash barrier, Guard rail:** Have to be present, clean, without any structural damage, without corrosion.	Visual Inspection	**2 points**	Up to 10 m length is Contractor's responsibility. In case of Damage of Crash barrier greater than 10 m length, the Contractor shall inform to Engineer to repair/reinstate it as Emergency Work.
OSL-B.6.7	**Vegetation growth Control:** Maximum average permitted height is 25 cm in Urban highway shoulders, medians, traffic islands and highway verges, grass in rest areas (including around rest area furniture).		**3 points**	

OSL No.	OSL Description	Method of Inspection	Payment Reduction Points (PRP) (*Note: PRP is applicable for each one Km section, unless otherwise specified for an OSL*)	Remarks
	Maximum average permitted height is 40 cm in Non-urban roads and large vegetated areas, including surface water channels with longitudinal gradient ≥ 3%. Maximum average permitted height is 25 cm around: • Edge marker posts • Signposts • Bridge end and culvert markers • Guardrails • Lighting Columns • Bridge abutments Vegetation-free or near Vegetation-free around: • Culvert headwalls • Side drains • Kerb and channel • All sealed surfaces • Bridge decks.	The height of vegetation it is defined as the vertical distance between the ground and the highest point of the plant. It is measured by using a ruler or measuring tape. Clearance is also measured with a ruler or tape; it is defined as the distance between the lowest point of the tree (or other plant) above the road surface. The average height of vegetation in a one km section will be equal to the average of five values measured at points selected by the Engineer, with each point being at least 10 meters apart from the next.		

OSL-B.7 ***: Performance of the Self Control Unit***

The correct execution of PBMC's depends to a large degree on the adequate functioning of the Contractor's Self-Control Unit – SCU (as defined in the Specifications) and on the accuracy of the data provided by the SCU to the Engineer. The Engineer will assess the performance of the SCU by comparing the data provided by the SCU in the Monthly Compliance Tables for Maintenance Services with the data measured or observed during the Formal Inspection.

The Contractor must ensure that the data included in the Monthly Compliance Tables for Maintenance Services prepared by the SCU and provided to the Engineer prior to the Formal Inspection is accurate and based on actual measurements or observations carried out by the SCU staff. The Engineer will verify the data provided by the SCU in the Monthly Compliance Tables through Formal and Informal Inspections.

If the Engineer finds that the data provided by the SCU for any road or road section is incorrect for more than 20% of the individual data on OSL´s A.1 to B.7 for a road or road section, this will be considered as a non-compliance with OSL-B.7 and will trigger the application of the corresponding payment reduction under OSL-B.7 for the same road.

Furthermore, if a situation of non-conformance with B.8 continues for more than six months, the Employer/Engineer will have sufficient grounds to terminate the contract as stipulated in the General Conditions of Contract, Clause 59 on "Termination" if he so desires.

Method of assessment: The assessment is done on the basis of the verification by the Engineer of the 20 performance criteria and sub-criteria included under OSL-A1 to OSL-B6. The 20% threshold limit corresponds to four (4) criteria. If for any road or road section the information provided by the Contractor's SCU in the Compliance Tables for five (5) or more criteria is incorrect, then this constitutes non-compliance with OSL-B.7 for that road or road section. An example for calculation is provided in the Operational Procedures.

Payment reduction for non-compliance: 20 points to be applied for each road or road section for which incorrect information was provided by the Contractor in the Monthly Compliance Tables for Maintenance Services for more than 20% of the OSL criteria or sub-criteria.

[Note: The figures in the above text for the "Method of Assessment" and "Payment reduction for non-compliance" must be adjusted if the number of OSL criteria and sub-criteria is either reduced or increased. The OSL's proposed in these Sample Specifications result in a total of 20 criteria and sub-criteria, but this number will be different if additional OSL's are added or the number of OSL's is reduced.]

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5. Operational Service Levels Category C

a) Pavement Roughness

The indicator to be used to determine the road roughness will be the International Roughness Index (IRI), whose measure unit is expressed in meters per kilometer (m/km).

An equipment meeting the Class III: Response Type Road Roughness Measuring System (RTRRMS) precision shall be used to measure the IRI. The measure of roughness shall be made in a continuous manner in the wheel-tracks of each lane of the carriageway. The equipment shall be calibrated/validated in accordance with the manufacturer's recommendations and from observation during previous use.

The IRI shall be measured at the end of Phase 1: Upgrading Works, at the beginning of Phase 2 and in 12 months' interval thereafter. The final measurement of IRI will be done 3 months before the end of Phase 2. The measurement shall be made in the presence of the Employer's and/or Engineer's Representative.

Table 29.5a Operational Service Level for Pavement Roughness Survey

OLS No.	OLS Description	Method of Inspection	Payment Reduction Point	Rectification Period
OLS-C.1	Roughness of Pavement of Highway* (IRI): Lane-wise average IRI of the entire contract length shall less than: a) 3.3 m/km at the end of first year of Phase 2 b) 3.5 m/km at the end of second year of Phase 2 c) 3.7 m/km at the end of third year of Phase 2 d) 4 m/km at the end of fourth year of Phase 2	An equipment meeting the Class III: Response Type Road Roughness Measuring System (RTRRMS) precision shall be used to measure the IRI. The measure of roughness shall be made in a continuous manner in the wheel tracks of each lane of the main carriageway.	**1000 points** for entire contract length per month after six months (rectification period) of detection	Six (6) months

*** Not applicable for service lane and access road.**

b) Surface Distress Index Survey

Any unsatisfactory performance of a pavement short of failure is the surface distress. Surface distress comprises cracking, disintegration (potholes), deformation, texture deficiency; pavement edge defaults and maintenance work (patchwork).The above distress shall visually assessed and recorded using a cumulative index called a "Surface Distress Index (SDI)". The method shall be simplified, "drive and walk" and also shall be by video recording the road and watching throughout the length of the roads which have been adopted instead of assessing only certain portion of the road.

The SDI is a six level rating index from 0 to 5. The rating 0 indicates a perfect pavement that is without any defects and rating 5 indicates a maximum possible deterioration (Table 29.6.1 SDI Score). The distress elements are divided into two groups; major defects and minor defects. (Table 29.6.2 Definition of Minor and Major Defects for Bituminous Roads)

Table 29.5b SDI Score

Scores	Incidence of minor defects	Incidence of major defects
0	None	None
1	1 to 200 sq.m. per 1000 m.	1 Occurrence
2	<50% of the area	2 to 4 occurrence
3	= 50%	< 30% of area
4		= 30% or potholes and base exposed < 20% of the area
5		Potholes and exposed base = 20% of the area

Table 29.5cDefinition of Minor and Major Defects for Bituminous Roads

S.N.	Types	Sub Type Abbreviation	Sub Type Definition
Minor Defects			
i.	Cracking	CN	Narrow interconnected cracks (1-3 mm width)
		CL	Line cracks (longitudinal or transverse)
		CS	Sealed cracks
ii.	Maintenance Patches	M	Distinct localized patchwork has been applied
iii.	Texture	RA	Shallow ravelling or scabbing (<20 mm)
		S	Slickness (texture depth, 1 mm)
		B	Bleeding
iv.	Short Edge Break	ES	Short edge break (> 100 mm < 5 m length)
Major Defects			
i.	Cracking	CW	Wide interconnected cracks (>3 mm)
ii.	Texture	V	Scabbing (>20 mm depth)
iii.	Rutting	RL	Rut depth >15 mm
iv.	Pothole	P	Pothole (>30 mm depth, >150 mm dia/length)
v.	Exposed base	G	Exposed base or sub base or gravel
vi.	Edge Break	LE	Long edge break (>100 mm, >5 m Length)
vii.	Depression/ humps	D	Corrugations of any type and extent

Scoring system of the various distress shall be as per HMIS established system, SDI is averaged over each road link or section under consideration and can only be used to provide an objective assessment of pavement condition.

The SDI shall be measured at the end of Phase 1: Upgrading Works, at the beginning of Phase 2 and in 12 months' interval thereafter. The final measurement of SDI will be done 3 months before the end of Phase 2. The measurement shall be made in the presence of the Employer's and/or Engineer's Representative.

Table: 29.5d Operational Service Level for Surface Distress Index

OLS No.	OLS Description	Method of Inspection	Payment Reduction Point	Rectification Period
OLS-C.2	Lane-wise average SDI of the entire contract shall be less than: a) 1.8 at the end of first year of Phase 2 b) 2.0 at the end of second year of Phase 2 c) 2.2 at the end of third year of Phase 2 d) 2.4 at the end of fourth year of Phase 2	Visual inspection and scouring of the defects using indicators presented in table 29.5 b and 29.5 c above	**500 points** for entire contract length per month after six months (rectification period) of detection	Six (6) months

6. Operational Procedures

The Operational Procedures described in this Section are to be applied in the implementation of Performance-based Road Contracts.

6.1 Verification of Operational Service Levels

The Contractor's compliance with Operational Performance Measures (OSL's) is to be assessed and verified through Formal Inspections, Informal Inspections and other inspections. This section specifies (i) the procedures to be applied for scheduling and carrying out Inspections and (ii) the application of payment reductions in cases of non-compliance of the Contractor with required Service Levels or other requirements.

6.1.1 Inspections

This section specifies the various types of inspections to be carried out and the procedures to be followed for those.

6.1.1.1 Formal Inspections

The main purpose of the regular Formal Inspections (Joint Inspection) is to verify the correctness of the information presented by the Contractor in his Monthly Compliance Tables for Maintenance Services about his own compliance with the Service Level requirements. The results of the Formal Inspections are used for finalizing the monthly Interim Payment Certificate.

Formal inspections are scheduled in advance by the Engineer and carried out by the Contractor through his Self-control Unit (SCU) with participation of the Engineer (Supervision Consultant). The regular Formal Inspections are to take place within first week of each month, but additional Formal Inspections may be scheduled by the Engineer at any time.

The Engineer must inform the Contractor's Self-Control Unit of the date and hour of the beginning of the Formal Inspection at least 24 hours in advance. The scheduling of inspections between the Engineer and the Contractor's Self-Control Unit (SCU) must be in writing, which may include the use of e-mail. The Engineer shall use the official e-mail address of the SCU which the Contractor must indicate in writing to the Engineer at the beginning of the Contract period.

The normal start date for the regular Formal Inspections is on the third work day of each month. This is to avoid any important time gap and change of physical road conditions between the date of the Contractor´s Monthly Compliance Tables for Maintenance Services and the actual road conditions during the regular Formal Inspection.

Formal Inspections shall typically take between 1 and 3 full days. The share of the network to be covered by the monthly Formal Inspection is at least *40% every month*. This percentage is however not an upper limit or a maximum. If the Engineer suspects widespread non-compliances along the network, he should expand the length of roads to be covered during the Formal Inspection which could reach up to 100% percent of the roads included in the contract. In such cases the Formal Inspection may take longer than 3 days. The Formal Inspection can be done for one continuous stretch of road, or for separate road sections scattered over the network covered by the contract. Each formal inspection will normally (but not necessarily) cover mostly sections which were not inspected during the previous Formal Inspection, but it may also cover places where non-compliances were detected during the previous Inspection.

The specific roads or roads sections to be covered by the Formal Monthly Inspection are to be selected by the Engineer, but only **after** having received the Contractor´s Monthly Compliance Tables for Maintenance Services. They are not to be defined or agreed prior to the Contractor having issued and transmitted to the Engineer the Monthly Compliance Tables for Maintenance Services.

The Contractor is obliged to be present at the date, hour and location specified by the Engineer, providing the physical means (including equipment) needed for the inspection. Both must have a signed hardcopy of the Contractor's Monthly Compliance Tables for Maintenance Services in hand (which shall cover the entire road network included in the contract). The main purpose of the Formal Inspection is to verify the information provided by the Contractor in his Compliance Tables, on his on compliance with Service Level requirements.

Should the Contractor fail to appear for (or participate in) a scheduled Formal Inspection, having been requested to do so with at least 24 hours' notice, then the Engineer may carry out the Formal Inspection without participation of the Contractor´s SCU staff. In such case, the determination of the Engineer as to the nature and extent of the defects and non-compliances detected shall be final and binding, with no possibility of appeal or objection by the Contractor.

Also, should the Contractor fail to submit his Monthly Compliance Tables for Maintenance Services at the end of the calendar month, the Engineer may nevertheless schedule the corresponding Formal Inspection to be carried out in order to establish the degree of compliance of the Contractor with the Operational Service Level (OSL's). Such failure to submit the Monthly Compliance Tables is also a non-compliance with the corresponding Management Performance Measure.

During the Formal Inspection the Engineer and the staff of the SCU shall travel along the road and stop as necessary, while verifying the information provided by the SCU in the Standard Compliance Tables. This is to ensure that the Contractor is immediately aware of any non-compliances identified by the Engineer. During the Formal Inspection any errors, discrepancies or misrepresentations in the Compliance Tables presented by the Contractor, as well as their locations and length, must be noted by the Engineer, communicated verbally to the Contractor and corrected on the Compliance Tables for Maintenance Services.

In addition, the Engineer shall also record any existing non-compliances which had already been recorded during the previous month(s) and which have not been remedied by the Contractor within the Rectification Period and apply the payment reductions for the non-compliance.

Within three (3) days following the Formal Inspection, the Engineer will prepare a brief Memorandum in which he shall (i) describe the general circumstances of the Formal Inspection, including date, road sections inspected, persons present, etc., (ii) show a list of all non-compliances detected during the Formal Inspection and (iii) show the Rectification Periods for remedying each non-compliance. The specific Rectification Period for each non-compliance shall count from the last day of the Formal

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Inspection during which the non-compliance was detected.
The Engineer shall use the corrected Monthly Compliance Tables for Maintenance Services for calculating the payment reductions for OSL's, and the total amount to be paid for Maintenance Services. The Engineer will then immediately transmit his Memorandum and the corrected Compliance Tables to the Contractor, as input for the Contractor's Monthly Statement.

7.1.1.2 Informal Inspections

The Engineer will also carry out Informal Inspections of the roads covered by the Contract. The Engineer may do so on his own initiative, at anytime and anywhere on the roads included in the contract. The Engineer must use his own means for those inspections. If the Engineer detects any road sections where the Service Level criteria are not met, he shall promptly inform the Contractor in writing (which may be by e-mail) of the defect identified, including its location, in order to enable the Contractor to take remedial action as soon as possible. The defect identified in Informal Inspections are to be rectified by Contractor within Rectification Periods mentioned in Table 32.2 for OSL Class A and within 28 days for OSL Class B.

The conduct of Informal Inspections by the Engineer and the notification of any identified non-compliances in no way affects the requirement for the Contractor to continuously monitor road conditions and his own compliance with required Service Levels, and to rectify all defects. It is the duty of the Contractor's SCU, not of the Engineer, to identify defects and ensure their rectification in a timely manner.

6.1.1.3 Physical means needed for Inspections

The physical means needed for the various types of inspections will be provided by the Contractor, with the exception of the means needed for Informal Inspections, which the Engineer will carry out using his own means.

2915 Payments

1) Basis of Payments

All works and services performed in Phase 2 are deemed to be covered and paid for by the Monthly Lump Sum per kilometer indicated in the Bill of Quantities. Only Day works and Emergency Works shall be paid on unit price bases as specified in the Bill of Quantities.

The works and services shall cover all costs associated with Contract obligations during Phase 2, which are not specifically provided for elsewhere, including (but without being limited to) the provision of insurances, security, implementing quality plan requirements, all social, environmental, safety and traffic management requirements, conducting various inspections, surveys, etc.

2) Payment Reductions

In accordance with these Specifications, payment reductions are applied in case of non-compliance with Operational Service Level requirements.

Where the Contractor fails to comply with Management Service Levels or Operational Service Level, the Employer shall deduct moneys from payments due under the Contract. Payment Reduction Points are specified for each non-compliance with Service Levels.

For the **Management Service** Levels Payment Reduction Points shall be applied when the Contractor does not comply with the Management Service Levels defined in Table 29.2 above.

For **Operational Service** Levels Category A, the Payment Reductions Points shall be applied when the Engineer detects the non-compliance and communicates the non-compliance to the Contractor. After receipt by the Contractor of the communication of the Engineer concerning the

non-compliance, the time starts for the Contractor to rectify the respective non-compliance within the Rectification Period in Table 29.3. Payment Reduction Points shall be applied if the Contractor does not rectify the non- compliance within the Rectification Period. *For each additional Rectification Period in which the Contractor does not rectify the non-compliance further Payment Reduction Points shall be applied until the non-compliance has been rectified. If the same non-compliance is not rectified within one month after the date of the first detection, the Engineer may contract a third party to rectify the non- compliance at the cost of the Contractor.* The same procedure shall be applied if the Contractor detects a non-compliance, except that no Payment Reduction Points shall be applied for the detection of the non-compliance.

For the **Operational Service** Levels Category OSL-B1 to OSL-B-6, the Payment Reduction Points (as per table 29.4) shall be applied immediately for any non-compliance of OSL detected in the Formal Monthly Inspection (Joint Monthly Inspection). If such non-compliances are not rectified within 28 days of first detection then there after one (1) Payment Reduction Point shall be applied (for each non-compliance) for each calendar day till the non-compliance is rectified.

If the same non-compliance is still not rectified until the following Joint Monthly Inspection, the Engineer/Employer may contract a third party to rectify the non- compliance at the cost of the Contractor.

For non-compliance of Operational Service Level OSL-7 the Payment Reduction shall apply for each case of non-compliance.

For the Operational Service Levels **Category C**, The Payment Reduction Points shall be applied when the Contractor does not rectify the non-compliance within the Rectification Period (table 29.5a and 29.5d). For any further period of one month, in which the non-compliance is not rectified, the Payment Reductions Points shall be applied again, until the non-compliance is rectified.

Contractor's obligation to inform Engineer about completed remedial measures: As soon as the Contractor has remedied the causes of a non-compliance with an OSL, he is obliged to inform the Engineer accordingly in writing (which can be by e-mail) and to attach any supporting evidence, such as photographs or video. The Engineer shall then decide if a follow-up inspection must be scheduled to verify if the Contractor has remedied the non-compliance, or otherwise if the Engineer accepts the evidence provided by the Contractor as proof for the non-compliance having been remedied. If the Contractor fails to provide such information to the Engineer in writing, the Engineer shall continue to apply the further payment reduction until such time when he receives the information from the Contractor on the remedial action having been taken.

Correct reporting by the SCU (OSL-B.7): As explained above, it should not be the Engineer having to point out non-compliances with OSL's to the Contractor. Instead, it is the Contractor's Self-Control Unit (SCU) who must proactively identify any non-compliances and report those in the Monthly Compliance Tables for Maintenance Services. The incentive for doing so is provided through OSL-B.7 titled "*Performance of the Contractor's Self Control Unit*". If for any road or road section the SCU has reported incorrectly more than 20% of the individual data for OSL, then there is non-compliance with OSL-B.7 and the corresponding payment reduction will be applied. A Sample Calculation is provided further below in table 29.6.

Non-recoverability of payment reductions: Payment reductions that have been applied cannot be recovered later, even after the non-compliance which has been the cause of the payment reduction has been remedied.

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No time limit for payment reductions: If the Contractor fails to remedy a non-compliance for which a payment reduction has already been applied during a Formal Inspection, the respective payment reduction will continue to be applied in the same way to the following Monthly Statement(s) for that particular cause of non-compliance, until the non-compliance has been remedied, without a time limit being applied.

Multiple non-conformances and limitation for payment reduction: Payment reductions due to specific non-conformances are cumulative. If a one-km section of road has several non-compliances, then the payment reduction to be applied is the sum of the payment reductions for each individual non-conformance. When an OSL (such as OSL-B.2) includes a group of Sub-Measures (e.g. patching, cracking in Pavement, Potholes, etc.), then if the road suffers from several of these defects, the overall Payment Reduction is equal to the sum of each individual payment reduction per type of defect. For accumulated OSL non-conformances within any one-km section, the maximum cumulative payment reduction in one month shall however be limited to 200 percent of the monthly lump-sum amount for Maintenance Services payable for that one km of road.

3) Sample calculation for OSL-B.7

OSL-B8 refers to the correctness of the information provided in the SCU´s Monthly Compliance Tables for Maintenance Services. Non-compliance with OSL-B.7 is triggered if the data set supplied by the Contractor´s SCU in the Monthly Compliance Tables for Maintenance Services for a road or road section is incorrect for more than 20% of the individual data on OSL´s. Compliance with OSL-B.7 is calculated by comparing the data supplied by the Contractor in the Compliance Tables with the verified and corrected data on OSL´s provided through the Formal Inspection. The payment reduction is calculated as follows:

Table 29.6 Sample Calculation for payment Reduction of OSL-B.7

OSL-B.7 Payment Reduction Point for Non-compliance : 25

Data No.	OSL List	Non-compliant length (km)		
		Data from SCU Monthly Compliance Tables	Data from Monthly Inspection	Incorrect Data supplied by SCU*
1	OSL-A.1	0	0	No
2	OSL-A.2.1	1	2	**YES**
3	OSL-A.2.2	2	2	No
4	OSL-B.2.1	2	4	**YES**
5	OSL-B.2.2	0	0	No
6	OSL-B.2.3	0	0	No
7	OSL-B.2.4	0	0	No
8	OSL-B.3.1	0	4	**YES**
9	OSL-B.4.1	2	2	No
10	OSL-B.4.2	0	0	No
11	OSL-B.4.3	0	0	No
12	OSL-B.4.4	0	0	No
13	OSL-B.4.5	0	0	No
14	OSL-B.5.1	1	3	**YES**
15	OSL-B.5.2	0	0	No
16	OSL-B.6.1	0	1	**YES**
17	OSL-B.6.2	1	1	No

18	OSL-B.6.3	0	0	No
19	OSL-B.6.4	0	0	No
20	OSL-B.6.5	0	0	No

Here, total No. of Data: **20;** No. of "Yes": **5**

20% of 20 OSL´s would be 4 OSL's, which means that if the number of "Yes" is higher than 4 then the Payment reduction is triggered and to be applied.

In this case there is 5 "Yes" which greater than 20% (i.e. 4) is, so Pavement reduction on OSL-B.7 applies.

Payment reduction point: 25 point
Payment reduction Amount = 25x1300 = NPR 32,500.00 (Taking payment reduction NPR 1,300.00 per point)

* Only applies if road condition is "worse" than reported by SCU, not if better

2916 Emergency Works

(1) Description of Emergency Works

The Contract includes Day works and Provisional Sum for Emergency Works to be executed during Phase 2 of the Contract. Emergency Works are designed to repair damage to the roads caused directly by natural or manmade phenomena with consequences occurring either in the area of the roads or elsewhere, but with a direct impact on the roads. Such phenomena may include: tropical depression, rainfall and winds of extraordinary intensity and/or duration, major landslides within or outside the right-of-way, floods with water levels above normal maximum flood levels, earthquake, major accidents or similar events causing considerable damage to the road.

Damage requiring repair by Emergency Works can be generally described as for example:

(i) Complete destruction of a culvert or other similar structure,

(ii) Road washouts or other damage equivalent to more than 50 m3 of material on a road section of 500 meters length,

(iii) Submersion of road along more than 100 meters length provided that the submersion is, in the opinion of the Employer, not the result of deficiencies in the drainage system or of insufficient maintenance of drainage structures, among others.

Eligible damage does not include "normal" damage, such as trees falling on the road, minor erosion of the road and embankments, and minor damage caused by traffic accidents, which shall be made good by the Contractor as part of the Works. Providing full support to the police and road users and arranging of signing and clean-up of the site or similar works as necessary are part of Works.

(2) Obligations of Contractor during Emergencies

During execution of Emergency Works the Contractor shall ensure that Operational Service Levels on the road are maintained. In particular, the Contractor shall ensure the normal use of the road including those sections affected by emergencies.

The Contractor shall provide the notice with description of the emergencies and expected date/time of reopening of the road, by the public media (FM Radio, Television or/and established multimedia display board) of the emergency with road closer, partial closer or any other obstacles for vehicular movement to the road user.

The Contractor shall take the measures necessary to reopen the road to traffic at the earliest possible time and maintain the road open during Emergency Works, without being entitled to any separate compensation for those measures. If necessary, the Contractor shall provide temporary detour roads as approved by the Engineer.

(3) Minor Works

Minor works that are below the thresholds indicated in the following Table 29.7 shall be carried out by the Contractor as part of the normal PBM Works, and a Work Order is not required. The Contractor shall inform the Employer of the damage and the rectification works undertaken.

Table 29.7: Thresholds of Some Activities for the Normal PBM Works

Activity	Unit	Maximum quantity per event to be rectified under normal PBM Works
Slides of material	m^3	50
Asphalt concrete	m^3	5
Sub-base course	m^3	10
Base course	m^3	12
Concrete (of any type)	m^3	5
Stone masonry	m^3	10
Gabion masonry	m^3	10
Embankment	m^3	25

(4) Procedure for Requesting Emergency Works

When damage falling under Emergency Works results in a reduction of any of the Operational Service Levels specified in this Contract, the Contractor shall make a formal request to the Engineer to allow him to carry out Emergency Works to rectify that damage.

In such a case, the Contractor shall (i) immediately inform the Engineer of his intention to do so by telephone, SMS or other means, (ii) document the circumstances of the event and the damage caused through photographs, video and other suitable means, (iii) prepare a written request stating the type of works he intends to carry out, their exact location, the estimated quantities and costs, the time required to complete the works and any other information as the Contractor may deem necessary. The request for Emergency Works shall be made immediately after the Contractor becomes aware of the existence of the damage.

After receipt of the request, the Engineer shall evaluate the request based on a site visit, and issue a Work Order with consent of Employer to carry out the Emergency Works. However, to re-established traffic flow Engineer can issue Emergency Work Order. The Work Order shall specify the type of works, their estimated quantities, estimated valuation, and the time allowed for their execution.

(5) Operational Service Levels

The Emergency Works shall comply with the requirements of the Specifications and/or applicable Standards and be subject to the Employer's approval. There is no individual Operational Service Level requirement for these works.

The Emergency Works are intended to assist the Contractor in bringing the road up to the required Operational Service Levels within the time frame allowed by the Employer in the corresponding Work Order.

Failure to bring the road to the required Operational Service Levels within the stated time frame shall result in deductions of the Monthly Payments at the rate of 0.5% per day of Emergency Work. The payment deductions shall not be higher than 15% of the amount for the Emergency Works.

The Contractor shall correct all non-conformances relating to Emergency Works as specified in the Work Order prior to the Time for Completion of Phase 2. If any section of the road does not meet the

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Operational Service Levels at the Time for Completion due to uncompleted Emergency Works, Liquidated Damages shall apply.

If the maximum amount of Liquidated Damages has been exhausted and the non-conformance on road has not been rectified, the cost of remaining rectifications shall be recovered from Retentions, Performance Security, any/or any other monies due or that may become due to the Contractor.

(6) Measurement and Payment

The quantities of completed Emergency Works shall be measured net on drawings or measured at Site, whichever is more appropriate as determined and approved by the Employer. Where required by the Employer, the Contractor shall verify both quantity and quality of the completed works.

Valuation of the completed Emergency Works shall be as established in the corresponding Work Order issued by the Employer for the particular work using appropriate BOQ Unit Rates and Prices or Day works Rates, if appropriate.

For the emergency works the budget is allocated in the Day works and/or the provisional sums, as appropriate for the payment of the works. The payment for emergency works shall be made at existing Bill of Quantities (BoQ) rates or at appropriate Day works rates for each corresponding BoQ pay items with the CPA (Change in Price Adjustment) Such payments shall not be subject to additional overhead as per because of the fact that the BoQ and Day works rates quoted by the Contractor are with his overhead.

2917 Appendices for Phase 2

Appendix A: Additional Technical Specifications

(a) Patching of Potholes/Delaminating

(i) General

This covers the repair of the potholes, delaminating and the damaged bituminous surface. The area to be repaired shall be located by the Contractor and marked out in square or rectangular shape, 30 mm beyond the extent of the damaged area, and then it shall be excavated with suitable equipment. The edges shall be cut vertically down to the required depth where the lower layer is suitable without any loose material. If the existing road base is damaged, it shall be also excavated to a depth required and removed as directed by the Engineer. The surface of the excavated area shall be thoroughly cleaned with compressed air to remove all dust and loose particles. The patching then shall be carried out as detailed below. On completion, the patch shall have the tolerances of -0 mm/+10 mm, under a straight edge laid across it.

(ii) Shallow Potholes and Delaminating

Shallow patching shall consist of repairs to the bituminous surface to a depth not exceeding 40 mm.

The area to be repaired shall be excavated and prepared as described in (i) above. The cleaned surface shall be primed with MC 30 cutback bitumen. The sides shall also be tacked / primed with cut back bitumen using brush. The excavated area shall, then, be filled with asphalt premix material. The premix shall have a net bitumen content of 5% to 6% by weight or as per design mix. It shall be compacted with approved mechanical tampers/vibratory roller. After compaction, the surface of the patched area shall be true to the lines and levels of the surrounding existing surface (no "skin patches" are allowable). All loose and/or surplus materials on the surface shall be removed.

Potholes of less than 80 mm in diameter or equivalent surface area do not need to be marked out in square or rectangular shape. They may be filled with asphalt premix after careful cleaning with compressed air to remove all dust and loose particles.

(iii) Deep Patching

Deep patching shall consist of repairs to the bituminous surface to a depth exceeding 40 mm.

The area to be repaired shall be excavated and prepared as described in (i) above. The excavation shall be filled with base course material with each layer not exceeding 75 mm in thickness and duly compacted up to the existing crust thickness less 40 mm. The surface of the compacted base after thoroughly cleaned with compressed air to remove all dust and loose particles shall be primed with MC 30 cutback bitumen and the sides shall also be tacked/primed with cut back bitumen using brush. The top 40 mm portion above the repaired pothole shall be filled with asphalt premix material. The premix shall have a net bitumen content of 5% to 6% by weight or as per design mix. It of the patched area shall be true to the lines and levels of the surrounding existing surface (no "skin patches" are allowable). All loose and/or surplus materials on the surface shall be removed.

(b) Bituminous Surface Edge Repair

Where loss of bituminous surfacing exists at the edge without damaging the base, edge repair shall be performed as described for shallow patching.

Where damage of the edge extends into the base/subbase, the edge repair shall generally be carried

out as specified for deep patching. Excavation shall be to a minimum width of 750 mm covering not less than 200 mm of the carriageway and not loose less than 500 mm of the shoulder.

The excavated area shall be filled with base material to a level 40 mm of below the existing level of the road and compacted as mentioned in deep patching. The surface of compacted base and sides of the excavated area shall be primed/tacked with MC 30 cut back the area shall be filled with asphalt premix material and compacted as specified for the patching. The final surface shall match with the adjacent surface in line and levels.

(c) Repair of Failed Sections

The depth of all dig outs to repair failed sections shall be a minimum 400 mm and all excavated material shall be removed from the site. Where full depth excavation is required, the limit of excavation shall be 25 mm below the existing sub-grade level.

Work shall include the supply, placement and compaction of base course material and the construction of a surfacing layer of 40 mm asphalt premix material, including prime/tack coat.

(d) Removal of Landslide Material

Material from major land slips or other debris or unsuitable material shall be removed and carted to a spoil site approved by the Employer. Work shall include clearing all debris and material from the site, loading, cartage to spoil and disposal.

Section 3100 – Miscellaneous Works

3102 Precast Member

Add at the end of sub-clause 3102(2) as follows:

Precast concrete member shall be laid with close joins with 1:2 cement sand mortar at the ends. The joints shall not exceed 10 mm in thickness and shall be neatly pointed with a pointing trowel. Guide lines and straight edges shall be used to ensure that the exposed faces and edgings are set to true lines and levels. Care shall be taken to protect all precast units against chipping or breakage during handling and laying. Broken or chipped Sections shall not be used and shall be replaced with undamaged units.

Add at the end of first sentence of sub-clause 3102(4) payment as follows:

Payment of precast member (Precast Drain, Culverts, Bridge Girders and Precast Kerb Stone elements) shall be made in two installments First installment of 75% of item rate shall be made upon the completion of pre-casting on the contractor's yard and receiving the satisfactory laboratory reports and the remaining second installments of 25% of item rate shall be made upon transportation and installation/laying of the precast elements and completion of 100% of the Works.

3105 Railings

(5) GI Pipe Railing with RCC Posts

(a) GI Pipe

Add at the end of the second paragraph as follows:

"The diameter of GI Pipe shall be as shown in the Drawings and/or as mentioned in the Bill of Quantities."

(b) RCC Posts

Add at the end of the second paragraph as follows:

*"*The size of the RCC poles shall be as shown in the Drawings."

Insert new Sub-clause (6) "GI Pipe Railing" as follows:

(6) GI Pipe for Railing

GI pipe shall comply with NS: 199/2046 (Heavy Duty). The diameter of GI Pipe shall be as shown in the Drawings and/or as mentioned in the Bill of Quantities.

All GI pipes shall be free from abrasions, rough or sharp edges, and shall not be kinked, twisted or bent. Any pipe which does not meet the requirements of the field Specifications shall be replaced at the Contractor's expense.

"The diameter of GI Pipe shall be as shown in the Drawings and/or as mentioned in the Bill of Quantities."

Renumber the Sub Clause (6) "Measurement" to Sub Clause (7) Measurement:

(9) Measurement

Delete the whole content of (7) "Measurement" and replace with the followings:

Measurement for GI Pipe Railing with RCC Posts

GI Pipe Railing with RCC Post shall be measured in linear meter for complete railing set including GI pipes and RCC posts installed and accepted. Railing shall include both horizontal and vertical members, posts including bolts, nuts, fittings, etc. as shown in the Drawings. It also includes the excavation for the foundation of the RCC post, preparation of the foundation and backfilling with the concrete of grade as shown in the Drawings to the satisfaction of the Engineer.

Measurement for GI Pipe for Railing in bridges

GI Pipe for Railing shall be measured in Mt. installed and accepted. The works shall also include complete fixing with the respective elements including bolts, nuts, fittings, etc. as shown in the Drawings to the satisfaction of the Engineer.

Measurement for MS for Railing

GI Pipe for Railing shall be measured in linear meter installed and accepted. The works shall also include complete fixing with the respective elements including bolts, nuts, fittings, etc. as shown in the Drawings to the satisfaction of the Engineer.

Renumber the Sub Clause (7) "Payment" to Sub Clause (8) "Payment":

3106 Approach Slabs

(1) General

At end of the first paragraph delete "..M20/40." and substitute with:"As per drawings"

(2) Measurement

Delete existing sentence and substitute:

"Approach slabs shall be measured as per the respective items in Section 2000 - Concrete for Structures".

3107 Drainage Spouts

(5) Measurement

Delete the entire content and modify as follows:

The drainage spouts shall be measured in number for the complete set including the materials, fabrication, and placement and finishing and the pipes for drainage spouts as shown in the Drawings and to the satisfaction of the Engineer.

(6) Payment

Delete the entire content and modify as follows:

The drainage spouts shall be paid at the contract unit price as mentioned in the Bill of Quantities. Such cost shall include all the cost for the complete set including the materials, fabrication, and placement and finishing and the pipes for drainage spouts as shown in the Drawings and to the satisfaction of the Engineer.

3108 Utility Facilities

(3) Measurement

Delete the entire content and modify as follows:

The galvanized steel bracket under utility facilities shall be measured in number (no) for the complete set including procurement of materials, fabrication, installation and completion as shown in the Drawings and to the satisfaction of the Engineer.

(4) Payment

Delete the entire content and modify as follows:

The galvanized steel bracket under utility facilities shall be paid at the contract unit price as mentioned in the Bill of Quantities. The payment shall include all the cost for the complete set including procurement of materials, fabrication, installation and completion as shown in the Drawings and to the satisfaction of the Engineer.

Add new Clause 3111 "High Density Poly-Ethylene (HDPE) Pipe" after Clause 3110 "Filter Material" as follow:

3111 High Density Poly-Ethylene (HDPE) Pipe

The pipes to be used for sub-surface drain, grouting purpose etc. if specified in the Bill of Quantities shall be made of high density polyethylene and shall comply with series as specifiedbyNS40/2040. Jointing of pipes shall be done by fine-cutting and heating following with equipment complying with the prescription of the HDPE pipe manufacturer. Pipes may be jointed with angles to fit the requirements of the terrain, but angles shall not exceed the maximum specified by the manufacturer. The joints shall be watertight and develop the same strength as unjointed HDPE material. The method of jointing shall be approved by the Engineer prior to starting the works.

For sub-surface drain purpose, pipes shall be provided with holes of minimum 5 mm diameter. The pipes shall be perforated by drilling minimum 50 holes per meter length on the upper half of the pipe in a staggered pattern uniformly distributed. The Engineer might adjust these specifications according to the site conditions.

The measurement and payment of HDPE pipe shall be made in meter (m) including jointing, fitting etc. all complete. The contract unit rate shall be the full and the final compensation to the Contractor as per Clause 112 to complete the works as per these Specifications.

Add new Clause 3112 "Galvanized Steel Base Plate" after Clause 3111 "High Density Poly-Ethylene (HDPE) Pipe" as follow:

3112Galvanized Steel Base Plate

The galvanized steel base plate shall be used in fixing the pedestrian handrails and crash barriers railings in the bridges as shown in the drawings. Materials, fabrication, transportation, installation and painting for base plate shall conform to the requirements of Section 2200.

All complete steel base plate elements, bolts, nuts, hardware and other steel fittings shall be galvanised or painted with an approved paint as specified in the Contract. If galvanized, all elements of the base plate shall be free from abrasions, rough or sharp edges, and shall not be kinked, twisted

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or bent.

Galvanizing shall be carried out as per Clause 2209. Damaged galvanized surfaces, edges of holes and ends of base plate cut after galvanizing shall be cleaned and re-galvanized.

The galvanized steel base plate shall be measured and paid in Kilogram (kg) for the complete works as shown in the drawings and specified in these specifications.

Add new Clause 3113 "Water Management in Median" after Clause 3111 "Galvanized Steel Base Plate" as follow:

3113 Water Management in Median

(1) Scope

This clause shall cover the work related to the construction of rain water management structures in median of the road. The work consists a) Laying of Geo-membrane and b) Construction of sub-surface drain.

Sub-surface drains shall be of close-jointed perforated pipes, surrounded by granular material laid in a base of the median.

HDPE geo-membrane as important components of base liner system as per design, drawings for rainwater protection and leachate drainage to the leachate collection pipes (Drain Pipes).

(2) Material

The materials used for construction of sub-surface drains shall comply with following requirements:

(a) Filter Material

Filter materials used in drains shall comply with the requirements specified in Clause 3110.

(b) Geo-membrane

An essentially impermeable membrane (liner or barrier) used to control fluid movement.

Geo-membrane (textured both sides) shall be made of HDPE of at least 1.5 mm thickness, duly protected from ultra-violet exposure with 2.5 per cent carbon black, in black colour, supplied in roll form with a minimum of 3 m width.

The joints of these sheets shall be heat bonded or seamed for effective permeation cut off. While fixing on to a base of the median, they shall not be punctured or stapled to impair their use.

(a) Geotextile

The geotextile fabric shall be a woven or non-woven or knitted fabric consisting of long-chain polymeric filaments or yarns such as polypropylene, polyethylene or polyester or any combination thereof, formed into a stable network such that the filaments or yarns retain their relative position to each other.

(b) Drain Pipe

Perforated pipes for the drains shall be of HDPE 160 mm internal diameter. Holes for perforated pipes shall be on one half of the circumference only and conform to the spacing indicated on the drawings. Size of the holes shall not ordinarily be greater than half of D85 size of the material surrounding the pipe, subject to being minimum 3 mm and maximum 6 mm. D85 stands for the size

of the sieve that allows 85 percent of the material to pass through it.

Jointing of pipes shall be done by fine-cutting and heating following with equipment complying with the prescription of the HDPE pipe manufacturer. The joints shall be watertight and develop the same strength as unjointed HDPE material. The method of jointing shall be approved by the Engineer prior to starting the works. Drain pipes shall be provided with holes of minimum 5 mm diameter. The pipes shall be perforated by drilling minimum 50 holes per meter length on the upper half of the pipe in a staggered pattern uniformly distributed. The pipe shall be wrapped with the Geotextile. The Engineer might adjust these specifications according to the site conditions.

(c) Back Fill Material

Backfill material shall consist of sound, tough, hard, durable particles of free draining sand-gravel material or crushed stone and shall be free of organic material, clay balls or other deleterious matter. Any particular grading for the backfill material or requires these to be designed on inverted filter criteria for filtration and permeability to the approval of the Engineer, the backfill material shall conform to the grading requirement as set out in following table:

Table 31.1 Grading Requirement for filter Material

S. No.	Sieve Designation	Passing percentage
1	11.20 mm	100
2	5.60 mm	91-100
3	2.80 mm	83-100
4	1.40 mm	59-96
5	710 micron	35-80
6	355 micron	14-40
7	180 micron	3-15
8	90 micron	0-15

(3) Construction

The detailed layout of the rain water management in median works shall be as instructed by the Engineer, based on the general layout given in the Drawing.

The work shall start with construction at outlet side and then go upgrade.

The line and level for laying of Geo-membrane and sub-surface drain shall be fixed.

Dumping and construction material from the construction shall be removed and base of median shall be compacted to the line and level.

Surface receiving the geo-membrane shall be free of loose material and sharp object. Adjacent rolls of the geo-membrane shall be overlapped to a minimum width 450 mm. The preceding roll shall overlap the following roll in the direction to the upgrade.

Laying of geotextile wrapped half perforated HDPE pipe of 160mm internal diameter above the geo-membrane shall be started at the outlet end and proceed towards the upper end, true to the lines and grades specified. Before placing the pipe, filter material shall be laid for the full width of the base of the median and compacted. Unless otherwise shown on the Drawing, the thickness of this layer shall be 150 mm.

After the pipe installation has been completed and approved filter material shall be placed over the pipe to the required level in horizontal layers not exceeding 150 mm. The minimum thickness of material above the top of pipe shall be 300 mm.

For remaining depth the filling works shall be carried out as per clause 1205 of these specification.

The finished slope shall be reshaped to facilitate proper surface drainage towards drains/culvert /bridges.

(4) Tests and Standard of Acceptance

Copies of the manufacturer's certificates for geotextile/geo-membrane and drain pipe to be used while shall be furnished by the Contractor. In addition, the Engineer may ask for testing in independent laboratories. All test results shall meet the specified requirements.

Minimum one set of test for gradation analysis and compaction of filter material shall be checked as per Table 5.2. And/or every change in source of material. The results shall meet specified requirements

(5) Measurement

Laying of Geo-membrane shall be measured in sq.m. Overlapping of geotextile/geo-membrane shall not be measured for payment.

Laying of Geotextile wrapped HDPE pipe including geotextile and filter material shall be measured in linear mater.

(6) Payment

Laying of Geo-membrane shall be paid at the respective contract unit rates.

Laying of Geotextile wrapped HDPE pipe including geotextile and filter material shall be paid at the respective contract unit rates.

The contract unit rates shall be the full and the final compensation to the Contractor as per Clause 112 to complete the works as per these Specifications.

3114 Canopy Bridges for Primates

(1) Objectives

Major objective of the Canopy Bridge is to assess if it supports habitat connectivity of arboreal animal fragmented by linear Infrastructure development such as roads and to minimize the effects of linear barriers. As many wild animal casualties including arboreal animal are recorded along the highway traversing through dense and critical habitat area, the bridge aims to minimize roadkill and maintain canopy connectivity in long run.

(2) Scope

This clause cover the furnishing of material and construction of Canopy Bridge which is a system used for primate conservation.

(3) Material

Steel Pole: The steel tubing used in pole fabrication shall be of steel of any approved process possessing a minimum tensile strength of 42 Kg/sq. mm and a chemical composition of not more than 0.06% Sulphur and not more than 0.06% phosphorous.

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The tubing diameter and tubing wall thickness shown in Table 1 for 9m height pole.

IS Designation	**410 SP-31**
Overall Height	9 m
Planting depth. m **Sections: Length, m**	1.5
Top (h1)	2
Middle (h2)	2
Bottom (h3)	5
Outside Diameter, mm	
Top (h1)	114.3
Middle (h2)	139.7
Bottom (h3) **Thickness, mm**	165.1
Top (h1)	3.65
Middle (h2)	4.5
Bottom (h3)	4.5
Approximate weight, Kg	147
Crippling load, kgf **Application of load from**	367
top of pole, m	0.3

The poles shall be galvanized with minimum coating of weight not less than 460-gm/-sq. m internally and externally.

Each pole shall be provided with a steel top plate 3-mm minimum thickness welded to the end of the section. The top plate shall not project beyond the perimeter of the top section. Each pole shall also be provided with a welded base plate welded to the bottom of the pole.

Pole Must be supplied Along with standard Cross Arms and Bracings Angles, Pole Clamps, GALVANISED STEEL BOLTS, NUTS AND MISCELLANEOUS FASTENING COMPONENTS for installation of wire rope fabricated from hot-rolled channels, angles and steel members. The steel channels and angles for transformer platform shall be fabricated in accordance with Indian Standards IS: 226-1975 and IS-808-1964or any revision thereof or other equivalent national or international standard provided that the resulting steel stock is of equal quality and strength. The minimum tensile strength of the steel shall be 4200 kg/cm2. Existing Transformer shall be reused.

Wire Rope: The wire rope shall be ordinary type having a 32 mm dia for main cable and 26 mm dia for diagonal cable. Wire rope must be supply along with required quantity of thimbles, bulldog grips bolts, nuts and miscellaneous fastening components for hoisting of cables and anchoring of it.

Cement Concrete: The cement concrete shall be M20 (for anchoring the cables on the ground and in foundation of steel pole. The cement concrete shall comply requirements as per Clause 2000: Concrete for Structure of Standard Specifications for Road and Bridge Works 2073 (Second amendment 2078).

(4) Construction

Construction methodology shall be as per following:

Erection of Steel Pole:

i. Preparation of foundation for steel pole, foundation shall be 0.50x0.50x1.5m (LxBxD).

ii. Steel Pole shall be erected vertically and set to plumb on the foundation hole with no lateral inclination.

iii. The foundation hole shall be filled by the placing of cement concrete, M20. Compaction, curing and protection of concrete shall be carried out as per Clause 2000: Concrete for Structure of Standard Specifications for Road and Bridge Works 2073 (Second amendment 2078).

iv. After hardening of the concrete ie after 28 days the contractor shall fasten the steel poles and conduct preparation works for hoisting of cable.

Anchorage Block:

i. The contractor shall design the anchorage block for anchoring the cable and get approval from the Engineer before construction works shall be commence.

ii. The contractor shall construct the anchorage works as per approved design, drawing and instruction of Engineer.

iii. The contractor shall prepare the foundation.

iv. Anchorage element shall be erected as per drawing and design on the foundation.

v. Placing of cement concrete, M20 shall be carried out. Compaction, curing and protection of concrete shall be carried out as per Clause 2000: Concrete for Structure of Standard Specifications for Road and Bridge Works 2073 (Second amendment 2078).

i. After hardening of the concrete ie after 28 days the contractor shall start hoisting of cable works.

ii. The contractor shall hoist main cable and then fastening of diagonal cables shall completed. All node points shall be fastened by using thimbles, bulldog grips and bolt and nuts as required.

iii. The contractor shall maintained the sag of the cable which should not be greater than:

$$S=wL^2/8T$$

Where:
S-Permissible sag
w-Weight per unit of the cable
L-Span Length
T-Tension in the cable

(5) Measurement and Payment

Construction of Canopy Bridge as specified in the Drawing and as directed by the Engineer shall be measured in number of Canopy Bridge all complete. The Canopy Bridge shall be paid at the contract unit rate which shall be full and the final compensation to the Contractor as per Clause 112 and for all costs required to complete the work as per these Specifications.

3114 Funnel Fencing

(1) Scope

This Section covers the erection of new funnel fences along the boundaries of the road or/and other required locations for restriction of the movement of the wild animal from unauthorized locations. Fencing is often used to direct (funnel) wildlife to a specific area, such as road and highway crossings. Funnel fencing is used to prevent wildlife crossing at high risk points and guide them to safer crossings (e.g., underpasses, overpasses, bridges, culverts) or to open areas with adequate visibility to allow motorists to avoid collisions.

(2) Materials

Posts, Stays, Standards and Droppers: Posts, stays, standards and droppers shall be of the type and size indicated on the Drawing. Concrete posts shall comply with the requirements of IS: 4996.

Bolts for Stay: Bolts shall be galvanized steel bolts of the required length and diameter. The diameter shall not be less than 12 mm. All the necessary bolts, together with nuts and washers, shall be supplied with each post.

Wire:

(a) Barbed Wire:

Barbed wire shall comply with the requirements of NS: 168 and shall be of mild steel grade, double strand, unidirectional twist wire, each strand 2.50 mm diameter for use at any height above ground. The wire shall be either lightly galvanized or fully galvanized, as specified in the Bill of Quantities.

(b) Smooth Wire (Barbless):

Smooth wire (Barbless) shall comply with the requirements of NS: 163 and shall be of the type specified below: Straining wire shall be 4 mm diameter, lightly galvanized wire. Fencing wire shall be high tensile grade, 2.24 mm diameter wire, either lightly or heavily galvanized, as specified in the Bill of Quantities. Typing wire shall be 2.50 mm diameter, mild steel, lightly galvanized wire for tying fencing wire to standards and droppers, and 1.6 mm diameter, mild steel, lightly galvanized wire for tying netting and mesh wire to fencing wire.

Manufacturing Tolerances for Wire: Nowhere the actual diameter of the wire shall be less than the specified diameter by more than the following tolerances:

Specified diameter	Tolerances
Up to 1.5 mm	± 0.03 mm
Above 1.5 mm up to 2.5 mm	± 0.04 mm
Above 2.5 mm	± 0.05 mm

(3) Installation of Post and Standard

Straining posts shall be erected at all ends, corners and bends in the line of fences and at all junctions with other fences. Straining posts not be spaced further apart than shown on the Drawing. The height of posts above ground shall be such that the correct clearance between the lowest wire and the ground can be obtained.

Posts shall be accurately set in holes and where shown on the Drawing be provided with concrete bases to the dimensions shown on the Drawing.

Holes shall be dug to the full specified depth of the posts.

Corner, end and straining posts shall be braced by means of stay or anchors, as shown on the Drawing or as directed by the Engineer.

Standards shall be firmly planted into the ground at the spacing shown on the Drawing or as directed by the Engineer. The spacing of standards between any two straining posts shall be uniform and not greater than that shown on the Drawing. In hard material standards shall be either driven or set in holes drilled into the hard material. The size of drilled holes shall be such that a tight fit is obtained. Care shall be exercised when driving standards in order to prevent buckling or damaging them.

All posts and standards shall be accurately aligned and set to plumb. After posts and standards have been firmly set in accordance with the fore -going requirements, the fence wire shall be attached thereto at the spacing shown on the Drawing.

(4) Installation of Wire

The funnel fence is composed of 4 strands of wire. Top and bottom wire shall be barbless and middle 2 strands shall be barbed wire.

All fencing wire shall be wired to the sides of standards or posts in order to prevent the wires from being displaced and becoming loose. The wire shall be carefully stretched and hung without sag in true alignment. It shall not be stretched so tightly that it breaks or the end, corner, straining or gate posts are pulled up.

Each strand of fencing wire shall be securely fastened in the correct position to each standard with soft galvanized binding wire. The binding wire for each horizontal fence wire shall pass through a hole in the standard to prevent slipping of the fence wire in a vertical direction, while the ends of the wire shall be wrapped at least four times around the fencing wire to prevent it from moving in a vertical direction.

At end, corner, and straining posts the fencing wire shall be securely wrapped twice around the posts and secured against slipping by tying the end tightly around the wire by means of at least six snug, tight twists.

Splices in the fencing wire shall be permitted if made in the following manner using a splice tool. The end of each wire at the splice shall be carried at least 75 mm past the splice tool and wrapped snugly around the other wire for not less than six complete turns, the two separate wire ends being turned in opposite directions. After the splice tool is removed the space left by it in the splice wire shall be closed by pulling the wire ends together. The unused ends of wire shall be cut close so as to leave a neat splice.

Droppers shall be tied to each fence wire with soft binding wire in the required position as specified for standards, to prevent slipping in a vertical direction. The spacing of droppers between any two straining posts shall be uniform. Anchoring to structures shall be done as shown on the Drawing.

The completed fences shall be plumb, true to line with all posts, standards and stays firmly set. The height of the lower fencing wire above the ground at posts and standards shall not vary by more than 50 mm from their prescribed relative vertical positions.

(5) Measurement and Payment

The funnel fencing shall be measured in linear meters inclusive of all excavations, installation of posts and standards, barbed/barbless wires and other requirements necessary to complete the work as per this Specification.

The fencing, measured as stated above, shall be paid at the contract unit rate which shall be the full and the final compensation.

3115 Median Fencing

(1) Scope

This Section covers the construction of median fencing as per the approved contract drawing. The location of the fencing and the sequence of the construction shall be as directed by the Engineer.The vertical members, their spacing, foundation excavation and concreting shall be to the required line and level and specified size shown in the drawing and as per the relevant section in this specification. Similarly the horizontal members and the jointing requirement shall be as directed by the Engineer. The finished surface shall be painted with the 1 coat primer and 2 coats of enamel painting to the satisfaction of the Engineer.

(2) Measurement and Payment

The finished median fencing as a whole as mentioned above and as shown in the drawing shall be measured in Running meter.

The fencing, measured as stated above, shall be

\ paid at the contract unit rate which shall be the full and the final compensation as specified in section 112.

3116 Relocation/Re-erection of Electrical Works

Scope of the Work:

The work under this sub section shall be executed under the supervision of the Nepal Electricity Authority (NEA) and the work under the scope of the BOQ shall comply the requirement in the Specification followed by the NEA and this can be available in Nepal Electricity Authority, Main Office, Ratnapark, Kathmandu, Nepal.

The Contractor shall execute the works as mentioned in the various items in the BOQ to the Satisfaction of the Nepal Electricity and the Engineer.

If the scope of the work is required to be changed as per the relevant Agency's ie. NEA's, requirement the quantity provided under various items in the BOQ may require to be deleted or increased. Based on the Agency's requirement the Contractor shall allow the Agency to carry out some activities together with their own activities.

Upon the request of the relevant Agency the Contractor may require to carry out some activities beyond the scope under this BOQ for which the Contractor will receive the payment separately from the Agency but while doing so the Contractor shall get written approval from the Engineer.

Measurement and Payment:

The works under various items in the BOQ shall be measured in the unit provided under the respective

items and payment will be made with the contract unit price in the respective items in the BOQ. While carrying out the scope of works under the BOQ supervision shall be made by NEA. The supervision charge and shutdown charge (if required) shall be paid from the Provisional Sum.

If there is any change in the scope in the work specified above the additional work measurement and payment shall be made based on the agreement between the Employer and the Contractor upon recommendation of the Engineer.

Add new Clause 3117 "Steel Drainer" after Clause 3116 as follows:

3117 STEEL DRAINER

The steel drainer is just a cover which is designed to prevent dirt and dust from entering the drainage pipelines.

Material: Stainless steel is used to covers satisfy the corrosion protective requirement for use on driveways. The drainer size not less than 100mm dia.

The steel drainer shall be fixed at regular interval along the driveways.

Measurement for payment: The measurement shall be in numbers.

Payment
The unit rate for the supply and fixing shall be payment in full for carrying out the work as per these Specifications.

Appendices:

Appendix1: List of Standards

Appendix 2: Vehicles for the Employer

Appendix 3: Office Furniture / Equipment for the Employer

Appendix 4: Accomodation Furniture / Equipment for the Employer

Appendix 5: Survey Instruments required at site

Appendix 6: Site Laboratory

Appendix 7: Laboratory Equipment

Appendix 8: Project Signboard

Appendix 1: List of Standards

The Contractor shall provide for the use of the Engineer, in accordance with the Specifications, copies of the latest editions of the following Standards, Publications and Codes of Practice; or copies of manuals containing details of these Standards: -

TRL ORN 3: A guide to surface dressing in topical and sub-tropical countries

TRLORN18: A guide to the pavement evaluation and maintenance of bitumen – surfaced roads in tropical and sub-tropical countries

TRLORN31: A guide to the structural design of bitumen – surfaced roads in tropical and sub- tropical countries.

TRLRR104: Preparation of cut-back bitumen.

NEPAL STANDARDS (NS)

NS163-2045(1988) Method of Test for adhesion of galvanizing of Gabion Wire

NS169-2045(1988) Requirements for mild steel wire (for Gabions)

INDIAN STANDARDS (IS)

IS: 73– 1992 Paving Bitumen Specification

IS: 217-1988 Cutback Bitumen-Specification

IS: 1124-1974 Method of Test for water absorption, apparent specific gravity and porosity of natural building stones

IS: 1597–1992 Code of Practice for construction of stonemasonry

Part 1 Rubble stone masonry Part 2 Ashlar masonry

IS: 2116–1980Sand for masonry mortars

IS: 2250-1981 Method of Test for cement mortar

IS: 2386-1963 Method of Test for Aggregates

Parts 1-6

IS: 2720 Method of Test for Soils

Parts 1-5, 7, 8, 10, 14, 16, 22, 28, 29, 37& 40

BRITISH STANDARDS (BS)

BS: 812-1975	Testing Aggregates
	Part 1: Methods for determination of particle size and shape. Part 2: Methods for determination of physical properties
BS: 1377	Methods of test for soil for civil engineering purposes
BS: 1881	Methods of testing concrete
	Parts 5,101-122,124,125,127,129,201-207 & 209

AMERICAN PUBLICATIONS & STANDARDS (ASTM/AASHTO).

AASHTO	Part I: Standard Specification for Materials Part II: Method of Sampling and Testing

All standards provided shall remain the property of the Contractor on completion of the contract.

OTHER PUBLICATIONS

In addition, the Contractor is to be familiar with and be able to provide, in part or in full or photocopies where possible, to the Engineer on a temporary basis the latest editions of the following Standards.

And/or Publications, which are mentioned in the most relevant Sections of the Standard Specifications for Road and Bridge Works, when so requested.

NEPAL STANDARDS (NS)

NS: 1 –2035(1978)	Specification for Burnt Clay Bricks
NS: 40-2040(1983)	Specification for High Density Polythene Pipes
NS: 80-2042(1985)	Specification for Reinforced Concrete Pipes
NS: 84-2042(1985)	Specification for Reinforcing Steel
NS: 112-2042(1985)	Specification for Enamel and Non-reflectorized Paint
NS: 163-2045(1988)	Specification for Smooth Wire
NS: 168-2045(1988)	Specification for Barbed Wire
NS: 190-2045(1988)	Specification for Primer Paint
NS: 191-2045(1988)	Specification for Reinforcing Steel
NS: 199-2046(1989)	Specification for Galvanised Iron (GI)Pipe
NS: 408-2054(1997)	Specification for Road Marking Paint

Other relevant NS documents as required by these Specifications.

INDIAN PUBLICATIONS & STANDARDS

IS: 277-1992	Galvanised Steel Sheets (Plain and Corrugated)

IS: 432-1982	Mild steel and medium tensile steel bar standard-drawn steel wire for concrete reinforcement
IS456-2000	Code of Practice for plain and reinforced concrete
IS: 1079	Steel plate
IS: 1161	Steel tubes
IS: 1566-1985	Steel mesh fabric (for concrete reinforcement)
IS: 1786-1985	High strength deformed steel bars and wires for concrete reinforcement
IS: 2062-1999	Steel for general structural purpose
IS: 2062-1986	Method of Test for galvanized hardware
IS: 2386	Method of Test for Aggregates
Parts 7 & 8	
IS2629-1985	Hot-Dip Galvanising of Iron and Steel
IS: 4031	Method of Test for Cement
Parts 2, 3, 5& 6	
IS: 5758:1992	Pre-cast concrete kerbs, channels, edgings and quadrants

Indian Roads Congress (IRC)

Specifications for Road and Bridge Works (Fourth Revision) 2001

IRC:89 Stone for Pitching/ Revetment on Slopes (Clause5.5.5.1) Other relevant IS and IRC documents as required by these Specifications.

BRITISH PUBLICATIONS & STANDARDS

BS: 12	Specification for Portland cement
	Requirements for composition, strength, physical and chemical properties of four strength classes.
BS: 63	Specification for Single-Sized aggregate for general purposes.
BS: 812	Testing Aggregates
	Methods for determination of soluble Chloride Content. Part 117 BS: 1707Specificationforhotbinderdistributorsforroadsurfacedressings
BS: 3049	Pedestrian guard rails(metal)
BS: 3148	Methods of test for water for making concret e(including notes on the suitability of water)
BS: 5075	Specification for concrete admixtures/workability agents
BS: 6044	Road Paint
BS: 6088	Reflecting beads (Ballotini)

BS: 6906	Method of Testing Geotextiles
	Part 1 - Determination of tensile properties using wide width strips
	Part 3 - Determination of water flow normal to the plane of geotextile under a constant head.
	Part 4 - Determination of puncture resistance (CBR puncture test) Part 6 - Determination of resistance to perforation (Cone drop test)
BS: 7263	Part 1:1990
	Pre-cast concrete kerbs, channels, edgings and quadrants

Other relevant BS documents as required by these Specifications.

AMERICAN PUBLICATIONS & STANDARDS (Including ASTM/AASHTO)

ASTM: D5	Bitumen Penetration of bitumen/(asphalt)
ASTM:D6/D1754	Loss on heating of bitumen/ (asphalt)
ASTM:D36	Softening point of bitumen/ (asphalt)
ASTM:D92	Flash and fire points of bitumen/(asphalt)
ASTM:D113	Ductility of bitumen/(asphalt)
ASTM: D2026	Standard specification for cutback asphalt (Slow curing type)
ASTM: D2027	Standard specification for cutback asphalt (Medium curing type)
ASTM: D2028	Standard specification for cutback asphalt (Rapid curing type)
ASTM: D4694	Standard specification for Pavement Falling Weight Deflecto meter(FWD)
ASTM:E950	Standard specification for Road roughness

Other relevant ASTM documents as required by these Specifications.

Asphalt Institute

Manual SeriesNo.2 (MS-2)-Asphalt concrete hot mix manual

Manual Series No.4 (MS-4) - The Asphalt Handbook

Manual Series No.14 (MS-14) - Asphalt cold mix manual

Other relevant Asphalt Institute documents as required by these Specifications

Appendix 2: Void

Appendix 3: Void

Appendix 4: Void

Appendix 5: Survey Instrument Required at Site

The Contractor shall provide, maintain and store the following survey instruments and equipment readily available to the use of engineer's representative until Contract Completion or as instructed by the Engineer.

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Survey Equipment Required at Site

S. No	Description	Quantity
1	Total Station with Standard Accessories and Aluminum Tripod prism less	1 Set
2	3 mtr. 3 Section Aluminum Ranging Rod	4 Set
3	Digital Thedolite	1 Set
3	Measurement Tool Kit (with GPS, Laser Distance Meter, Digital Verner Caliper, 5 m steel tape, Protector, Set squares, Scale etc.)	3 Set
5	Auto Level with Tripod	3 Set
6	5 mtr 5 Section Levelling Staff	6 Set
7	Clip on Bubble	3 Set
8	50 mtr Nylon Coated Steel Tape	3 Set
9	50 mtr Fiberglass Tape	3 Set
10	30 mtr Fiberglass Tape	3 Set
11	5 mtr Steel Tape	5 Set

The above equipment are minimum numbers required. Depending upon the actual requirements at site, the Contractor shall arrange for other and/or additional survey equipment as instructed by the Engineer.

Appendix 6: Site Laboratory

1. Scope

The Contractor shall provide and maintain an adequately equipped site laboratory complete with all manpower, utility services, apparatus, furniture and fittings to undertake the required testing to assure the quality of the materials and the works.

Site Laboratory shall be fully equipped with a complete set of equipment as indicated in **Appendix – 7.**The Contractor is responsible for the cost of undertaking all testing necessary for Quality Assurance purposes. Tests which cannot be carried out in Site Laboratory shall be undertaken by an outside laboratory acceptable to the Engineer. The Contractor shall be responsible for providing the vehicles required carrying out day to day (regular) process control testing and collecting the samples to be tested in Site Laboratory at his own cost.

The Site Laboratory shall be located within 500 m of the site and the laboratory building may be located at the rented building or newly constructed on rented land or constructed on land on lease whatsoever shall be available up to the end of the project.

The working table with shelves for storing the equipment, heavy duty working table, and other racks shall be provided by the Contractor at the laboratory as per the instruction of the Engineer. The Contractor shall supply desktop computer and A-4 size printer at laboratory for sole use of the laboratory. First aid kit box, fire extinguisher and other safety appliances shall also be provided at the laboratory by the Contractor.

In order to operate the site laboratory the Contractor shall deploy at least the following:

- Generator 20 KVA minimum
- Pick-up truck
- Quality Control Engineer – 1No.
- Laboratory technician – 1No.
- Laboratory helpers – 3 Nos (minimum but shall supply additional numbers as required)

2. Description

The Site laboratory shall be newly constructed or rented and furbished to be a laboratory and provided with amenities including water supply, electric supply etc. as indicated below:

- The laboratory shall be provided with 240 volt, 50 HZ electricity. Lighting and sufficient electrical outlets shall be provided to the satisfaction and approval of the Engineer.
- A continuous supply of water with a minimum of two sinks with faucets shall be provided.
- The floor of the building shall be concrete suitably sealed and adequate to support operating test equipment without vibration and undue noise.
- A minimum of 10 metres of work benches, 900 mm high by 750 mm wide, shall be provided. The work benches shall have tops covered with approved plastic laminate or equivalent shall contain adjustable shelves and drawers and shall be constructed of concrete / 19 mm plywood. A minimum of 6 metres of cupboards shall be constructed approximately 600 mm above the workbenches. These cupboards shall have a minimum of two 450 mm high shelves approximately 300 mm deep. All cupboards shall be provided with doors.
- A minimum of four exhaust fans, three ceiling fans with regulators and three opening windows

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with blinds.

- The laboratory shall be provided with double entrance doors wide enough to unload materials from site vehicles into the laboratory. A minimum clear opening of 2 metres shall be provided.

The laboratory shall be operated strictly under the supervision of the Consultant's Material Engineer. The manpower supplied by the contractor for the operation of the site laboratory shall work to the satisfaction of the Consultant's Material Engineer and they will use the facilities detailed above together with the Consultant's Material Engineer. The Contractor shall provide additional office space/accommodation for his other staff in addition to the designated laboratory to the Engineer. The Contractor's other staff shall strictly be prohibited in using the laboratory space for their office/accommodation.

Prior to the construction of the laboratory, the Contractor shall obtain written approval from the Engineer for the proposed construction and arrangement of the laboratory.

Office for Material Engineer

Each room shall be fitted with two 40 watt fluorescent light fittings, ceiling fans with regulators. The laboratories shall have at least five 5A and two 15A electric outlets. The Material Engineer's office shall have minimum required furniture and equipment for the operation of the day to day office works.

The Contractor shall provide the facility for communications between the Consultant's staff and the Contractor's staff.

The Contractor shall supply and keep replenished all consumable items.

Appendix 7: Laboratory Equipment

The following items of laboratory equipment shall be provided in the laboratory, as a minimum, however, this does not relieve the Contractor of his responsibility to equip the laboratory with all equipment needed to perform the full range of tests required by the Specifications:

S.No.	Particulars	Quantity
	General	
1	Oven 18" x 18" x 18" Aluminum Chamber	1
2	Platform balance 300 kg	1
3	Electronic Balance Model CH30R11 Capacity 30 kg x 5 gm preferably OHAUS or equivalent	1
4	Electronic Balance Model CT6000 Capacity 6010 gm x 0.5 gm preferably OHAUS or equivalent	1
5	Electronic Balance Model NDB110 Capacity 2100 gm x 0.1 gm preferably OHAUS or equivalent	1
6	Water bath serological 2 rack solar	1
7	Mercury Thermometer 250^{0}C	2
8	Dial Thermometer 400^{0}C	2
9	Mercury Thermometer 50^{0}C	2
	Glassware: containers and small tools including;	
10	Wet and Dry Thermometer	1
11	Spatulas 200 mm	2
12	GI Wire Zinc coating and diameter test	1
13	**GI Tray**	
	300 mm x 300 mm x 75 mm	6
	400 mm x 400 mm x 75 mm	6
	600 mm x 600 mm x 75 mm	6
14	Aluminum Moisture Container 75 mm x 50 mm	50
15	Rubber Mallet	1
16	Aggregate Steel Scoop (690 mm x 300 mm x 100 mm)	1
17	Aluminum Scoop (125 mm x 200mm x 75 mm)	1
18	Gauging Trowel	2
19	S.S Bowl 2 Lit	2
20	***Volumetric Flasks***	
	1000 ml	2
	500 ml	2
	250 ml	2
21	***Measuring Cylinders***	
	1000 ml	2
	500 ml	2

S.No.	Particulars	Quantity
	250 ml	2
22	***Beakers***	
	1000 ml	2
	500 ml	2
	250 ml	3
23	Evaporating Disc 100 mm	3
24	Vernier Caliper 150 mm	1
25	Steel Ruler 300 mm	1
26	Pairs of heat resistant Asbestos hand gloves	2
27	Set of sampling tools all materials	1
28	Set of crowbar, pick, spade and 5 kg hammer, GI Tray	2
29	Gunny bags and plastic bags	50
30	GI Sieve 450 mm dia Size; 75, 69, 63,50, 37.5, 31.5, 25, 20, 14, 16, 12.5, 9.5, 6.3, 4.75, Lid and pan set of 16 pcs	1
31	Brass Sieve 200 mm dia Size; 4, 2.8, 2.36, 2, 1.18mm, 600, 425, 300, 150,170, 75 mic,90 mic ,Lid and pan set of 14 pcs	1
32	Dynamic Cone Penetrometer equipment complete with 2 extra cones and 2 extension rods (set)	1
33	Water Testing kit (set)	1
34	Organic Content testing kit (set)	1
	Soil and Aggregate	
35	Sample Splitters (Riffle boxes) 50 mm	1
36	Liquid limit device with grooving tools and counter	1
37	Glass Plate 400mm x 600 mm x 6 mm	2
38	Specific Gravity Bottle 100 ml	1
39	Compaction Mould 100 mm, 150 mm and Rammer 2.5 kg and 4 kg	1
40	Sand Pouring Apparatus 200 mm (sand replacement test)	2
41	Sand Pouring Apparatus 100 mm (sand replacement test)	1
42	Core Cutter Apparatus	1
43	Aggregate Impact Value Test Apparatus	1 set
44	Los Angeles Abrasion Test Apparatus	1
45	Flakiness Test Apparatus	1
46	Elongation Test Gauge	1
47	Standard Measure 30 lit, 15 lit and 3 lit	1
48	Tamping Rod	1
49	Aggregate Crushing Value Test Mold	1
50	Set equipment for specific gravity determination of both course and fine graded soils, including ancillary glass ware including pycnometers, and Guy Lussure type density bottles of Capacity	1 set

S.No.	Particulars	Quantity
	100 ml.	
	CBR Apparatus	1
51	CBR Load Frame	1
	Dial Gauge (0.01 - 0.25 mm)	5
	Annular Weight 2.5 kg	3
	Central Hole Weight 2.5 kg	3
	CBR Mould 150 mm	9
	Perforated Plate Brass	9
	Space Disc	9
	Penetration Piston	1
	Tripod	9
	Rammer 2.6 kg	3
	Rammer 4.89 kg	3
52	Unconfined Compression Test Apparatus (5 Tonne Capacity plus 5 kN, 10 kN and 20 kN Proving Rings)	1
	Bitumen and Bituminous Mixes	
53	Penetrometer with standard needle automatic	1
54	Viscometer	1
55	Standard spray trays	12
56	Centrifuge Type land operated bitumen extractor 500 ml	1
57	3 m straight edge	1
58	Camber board and spirit level	2
59	Marshall Stability test Apparatus, complete	1 Set
60	Softening point test (Ring and Ball)	1 Set
61	Flash point Apparatus	1 Set
62	Ductility test Apparatus	1 Set
	Cement and Cement Concrete / Mortar	
63	Vicat Apparatus	1
64	Slump Test Apparatus	1
65	Concrete Cube Mould 150 mm	18
66	Mortar Cube Mould 75 mm	42
67	Compression Strength Testing Machine 200 tonne capacity	1
68	Compression Strength Testing Machine 50 tonne capacity	1
69	Sand equivalent test set, complete with graduate plastic cylinder, manual or mechanical shaker and stock solution	1
70	Curing tank for test cubes (2 m x 2 m x 0.75 m) with controlled heating facilities	1
71	Light weight hammer test	1

Minimum furniture at laboratory

S.No	Item	Description	Nos
1	Executive Tables	0.75mx1.5m with two drawer on either side	1.00
2	Computer Tables	Purpose Made	1.00
3	Cushion Chairs		2.00
4	Arm Chairs with cushion		4.00
5	Steel Almirah	2.0 m high x 1.0 m wide x 0.35 m deep with shelves and two doors	1.00
6	Steel Filling Cabinet	With four drawers	1.00
7	Book Shelves	1mx2mx0.3 3 shelves	1.00
8	Desktop Computer of Acceptable Brand	Processor:-Core i5 or above, Memory:- 8 GB or above, Hard Drive:-500 GB or above, Mouse:-USB Optical Mouse, Keyboard:-USB Standard, Monitor:-18.5" wide LCD Monitor	1.00
8	Fire Extinguisher		1.00
9	First Aid Box with necessary medicine & bandage etc.		1.00

The site laboratory equipment and furniture shall become the property of the Contractor when no longer required by the Engineer unless stated to the contrary elsewhere in the contract.

Appendix 8: Project Signboard

The Contractor shall provide and erect at the beginning and end of each section of Project road a signboard approx. 2.50 m wide by 1.80 m high with the wording in Nepali or English.

Final details to be agreed and modified as necessary with the Engineer (see drawing).

The board is to be made of galvanised steel; the lettering and border are to be in black on yellow background. The lower edge of the board shall be at approx. 1.20 m above adjacent ground and shall be mounted on suitable posts with struts on concrete foundations. The paint to be used shall be sunshine resistant paint.

The Contractor will be responsible for the repair and maintenance of the signboards up to the completion of all construction works.

The Engineer will direct the location and placing of the signboards.

GOVERNMENT OF NEPAL
MINISTRY OF PHYSICAL INFRASTRUCTURE AND TRANSPORT
DEPARTMENT OF ROADS
Development Cooperation Implementation
Division, Chakupat, Lalitpur

WORLD BANK, WB
Project No. - NP

CONTRACT NO.
CHAINAGE

CONTRACTOR : xxxxxxxxxxxxxxxxxxxx

: xxxxxxxxxxxxxxxxxxxxxxxxx

CONSULTANTS : xxxxxxxxxxxxxxxxxxxxxxxxxxxx

: xxxxxxxxxxxxxxxxxxxxxxxxx

Section: VII C Environment and Social (E&S) Requirements

Sub-Clause/Clause No.	Sub-Clause/Clause	Remarks
4.6	Co-operation	Contractor shall cooperate in monitoring and conducting environmental and social assessment
4.8	Health and Safety Obligations	The OHS specialist should be hired by the contractors before commencement of the civil works. The contractor will appoint the primary health officer who is responsible to provide the primary health treatment to the labor groups and their staffs. The details has been mentioned in the LMP document that has already been disclosed in DoR's website, which shall be followed.
4.18	Protection of the Environment	For production, transportation, handling, and storage of hazardous chemicals contractors should follow the procedures as prescribed in ESMP of disclosed ESIA.
4.21	Security of the Site	Prepare, adopt and implement traffic managemant plan within and around the construction sites.
4.23 (c)	Archeological and Geological Findings	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: (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 implement any other action consistent with the requirements of the Specification and relevant Laws.
6.2	Rate of Wages and Conditions of Labour	The minimum wage rate fixed by Government of Nepal shall be provided to the Labours. There shall not be discrimination in wage rate for male and female in similar works. The national labour and employment law shall be followed.
6.27	Traning of Contractor's Personnel	The E&S orientation, orientation on traffic and road safety, emergency preparedness (refer para 19 of ESS-4 of ESF), OHS(tool box talk), GBV(SEA/SH) orientation

Management and Safety of Hazardous Materials

The Contractor shall implement measures and action to control safety of deliveries of hazardous material and storage, transportation and disposal of hazardous material and will implement measures to avoid or control community exposure to such hazardous material.

Resource Efficiency and Pollution Prevention and Management

- **Resource efficiency**

The Contractor shall specify the measures for improving efficient consumption of energy, water and raw materials, as well as other resource utilized during the commencement of civil works.

  - **Energy:** The contractor shall adopt the environment, health and safety guidelines (EHSG) of WB to optimize energy uses, to the extent technically and financially feasible and shall apply any applicable measures to optimize energy usage.

  - **Water:** The contractor shall adopt measures, to the extent technically and financially feasible, that avoid or minimize the water uses so that it doesn't have significant impact on the communities and the environment. In case of use of water sources, the contractors should apply the appropriate mitigation measures.

  - **Raw material:** The contractors shall adopt measures, to the extent technically and financially feasible, that minimize the use of raw materials from the vicinity of project area and should follow the recommendation for material extraction as prescribed in the disclosed ESIA with appropriate mitigation measures.

- **Pollution prevention and management**

  - **Management of air pollution:** The contractors shall apply the alternatives and implement technically and financially feasible and cost-effective options to avoid or minimize the project related air emission during operation.

  - **Management of hazardous and nonhazardous wastes:** The contractors shall avoid the generation of hazardous and non-hazardous wastes. The contractors shall apply measures to minimize the generation of waste, and apply the techniques like reuse, recycle and recover waste in a manner that is safe for human health and the environment including storage, transportation and safe disposal of hazardous wastes.

  - **Management of chemicals and hazardous materials:** The contractors shall avoid or will minimize and use of chemicals and hazardous materials subject to national and international guidelines. The contractors shall consider the less hazardous substitutes where hazardous materials are intended to be used in manufacturing process and other operations.

- **Biodiversity Conservation and Sustainable Management of Living Natural Resources**

The contractors shall manage the living natural resources in a sustainable manner, through the application of good management practices, and available technologies that helps to minimize the potential impacts on local, nearby or ecologically linked habitats, bio-diversity and communities, including indigenous people. The contractors shall also manage the risk of invasive alien species during the execution of the works.

- **Road Safety**

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, Contractor's Equipment on public roads or other public infrastructure.

The Contractor shall monitor road safety incidents and accidents to identify negative safety issues, and establish and implement necessary measures to resolve them.

During construction work special traffic management required for smooth flow of public traffic.

Section VII D – Environmental and Social Management Plan (ESMP)

The ESMP provides a description of the various environment and social management measures and their implementation arrangements during Construction & Operation Phases. The contractors ESMP have to prepare all the required plans before implementation of the sub-project activities and it should follow the legislative measures of Government of Nepal and the Environmental and Social Framework (ESF) of WB.

Referencing to the potential negative impacts of the sub-project as described in Table 1 the identified compensation, mitigation and enhancement measures during the pre-construction stage will be implemented by Project Implementation Unit (PMU) or DoR and by Contractor as follows:

Pre-construction Activities by Contractor:

The Contractor after mobilization at the pre-construction stage will be responsible for logistic, counting planning and site preparation to construction. The Contractor activities include review of contract packages for civil works implementation and development of work plan, following to legislative provisions and existing practices. Along with other preparation activities (such as procurement of equipment for road works, etc.), the Contractor will prepare

i. Erosion control plan with bioengineering and reinforcement structures;
ii. A stockpiling and excavation management plan to minimize effect during construction and rehabilitate landscape after construction;
iii. Labour Camp Management Plan in line with LMP;
iv. Code of Conduct for Workers;
v. Occupational Health & Safety (OHS) Plan,
vi. Community Health and Safety Management plan
vii. Water and Waste Management Plan
viii. Pollution Prevention Management Plan
ix. Traffic/ Road Safety Management Plan,
x. Quarry/ Borrow Area Operation and Rehabilitation Plan,
xi. Site Restoration Plans in accordance with GoN and WB' Guideline
xii. Construction Management Plan with Proper Schedule
xiii. Emergency Preparedness Management Plan
xiv. Gender Based Violence (GBV) Action Plan
xv. Project Information Sharing and Communication Plan

The Contractor will be also responsible to identify and select of material resources (quarry and borrow materials, water, sand) and debris disposal locations, based on recommendations of PIU (DoR) as well as planning of traffic diversions and detours during construction time. All prepared plans will be reviewed and approved by PIU (DoR) prior to start of construction works.

Disruption to road traffic and other access routes will be minimized in consultation with local authorities and representatives. Contractor will be responsible to prepare and update traffic management plans prior to the construction activities. Contractor will follow local laws and regulations as per DoR.

Contractor will comply with IFC Accommodation Guideline 2009 (Workers' accommodation: processes and standards; A guidance note by IFC and the EBRDIFC) for the establishment of constructed related camps for labour and engineers.

Construction Stage Activities by Contractor

Construction stage activities will require careful management of generic and site-specific environmental impacts. They will include (i) Implementation of site-specific mitigation measures as recommended; (ii) Monitoring the quality of environmental parameters along the construction sites (air, noise, water and soil). The Contractor's environmental and Social responsibilities will be prescribed in the Tender Documents and later in documents on the award of the Contract. They would include the need to adhere the social and environmental clauses in the Contract and the measures outlined in the ESMP.

The Contractor will comply with all statutory requirements, environmental and Social regulations and environmental quality standards as stated in the Environment Protection Act, 2019 of GoN, Environment Protect Rules 2020 of GoN; for any work in the community forests (CFs) adhere to the Forest Act, 2019 and rules prescribed by the CFs' authorities, GoN and Nepal environmental guidelines relevant to the project and the updated ESMP. Necessary permissions for contractor personnel to enter community forests must be obtained either from MoFE or from Community Forest User Groups. Similarly, the contractor should follow the guidance of environmental and social standards (ESS) under ESF-2018. Following the ESS, contractors should have to address the following measures as: environmental and social risks, management of labors, resource efficiency and pollution prevention, community health and safety, land acquisition, biodiversity conservation and sustainable management of forest resources, indigenous peoples, conservation and management of cultural heritage and engagement of stakeholders. Contractor shall bear all costs associated with environmental pollution avoidance and environmental mitigation, including clean-up operations, if necessary, within community forest areas.

Following the developed recommendations, the Contractor will employ local labour for the works to the maximum possible extent. No children under age of 14 should be employed and children between 14 and 18 should not be engaged in hazardous works, in compliance with the labour rules in Nepal.

All construction sites will be maintained in clean and safe conditions, providing appropriate facilities for temporary storage of all wastes before transportation and disposal. All generated wastes will be disposed in environmentally acceptable manner, including consideration of the nature and location of disposal sites with least environmental impact. Precautionary measures should be taken, when handling and storing fuels and lubricants, to avoid causing environmental pollution, including establishment of contingency plans for clean up in the case of spillage.

Adequate supply of water for drinking and washing purposes will be provided for all site personnel. Drinking water quality should comply with GoN standards and WHO guideline value. Adequate sanitation facilities shall be provided on all construction sites, contractor's office(s) etc., when established. Disposal from all sanitary systems shall be undertaken to avoid causing environmental pollution. Wastewater should be routed through suitable sanitary facilities and soak ways, without contaminating either ground or surface water or causing a health risk.

Operation Stage Activities by PIU:

Monitoring and maintenance of the environmental and social attributes will be conducted by PIU (DoR) and Contractor in the manner outlined in the monitoring plan under supervision of the responsible engineer.

i. The proponent will carry out regular maintenance work of road and bridges when and where necessary. Periodic maintenance will be carried out to maintain road clean and safe, especially prior to and post monsoon season.
ii. Length man will be recruited in every kilometer along the new and existing alignment to maintain road clean and maintain roadside drainage in working condition.

iii. The proponent together with other stakeholder such as community forest user groups, forest area office and Division Forest Office will carry out monitoring of plants planted as compensation.

iv. Proponent will maintain and renovate all roadside furniture regularly to provide roadside services and facilities.

v. Proponent will carry out regular monitoring of traffic flow and regular maintenance of traffic signals as well as install CCTV for regular monitoring and will maintain safety along the road alignment.

Contractor's Environmental Social Management Plan

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
ESS 1: Assessment and Management of Environmental and Social Risks and Impact									
Acquisition of structures as parts of site clearance	Impact on 4 Vulnerable Households / Livelihoods	289+840 to 312 + 785	Cash compensation of loss structures with replacement cost / Livelihood restoration training	Details are in RAP cost table 10. 10)	Project Office/ Contractor	DoR-DCID / GESU / construction Supervision Consultant	Review of Compensation payments summary details / Observe of livelihood restoration training	Checking received cash and Voucher / Training number	Monthly
Combined Impacts from associated projects (East-West Railway Projects, FastTrack, Transmission line project from Heatauda to Innurwa , Upgrading of Kamala-Kanchanpur road, Pathalaiya –Narayanghat road, Nijgdh	Cumulative Impacts: 1.Sedimentation 2. Water lodging 3. Impact on wildlife movements and forest 4. Pressure in Natural resources 5. Pressure in public service		River training works, turffing, constriction of box culverts for passage of water/drainage, design of wildlife crossings as per wildlife friendly infrastructure guideline of Nepal, sustainable use of natural resources required by project, Increase number of public service facilities as per requirement, Initiation for policy development for land use classification and protection of agriculture land, Management of RoW and Urban development planning, are recommendations		Project Office/ Contractor	DoR-DCID / GESU / construction Supervision Consultant	Correspondence letters, observation	Proposed mitigation of other projects in aligned with KDP road project	Monthly

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
International Airport, Postal Highway, Madhan Bhandari Highway)	facilities 5Impact on agriculture land 6. Change in land use pattern 7. Migration		for further action and study						
Disaster Risk from Flood Hazard	Flooding hazard, River bank cutting Sedimentation		River training works, turfing at bridge side, plantation of bamboo and grasses within ROW, maintenance of drainage and cross drainage structures	Included in BoQ	Project Office Contractor	DoR-DCID-GESU / construction supervision consultant	Site visit and observation, Consultation with local people	Reduced disasters	Annually
Public demands	Crossing issues to the locals		Construction of 4 VUPs and 8 PUPs	Included in BoQ	Project Office Contractor	DoR-DCID-GESU / construction supervision consultant	Site visit and observation, Consultation with local people	Reduced disasters	Annually
ESS 2: Labor and Working Condition									
Workplace health and safety hazards	Influence to safe and healthy work and working condition. and their impact to project workers and personnels		▪ Establish preventive safety culture at work through safe work practices in construction. ▪ Preparation and implementation of Occupational Health and Safety Plan. ▪ Develop site regulations for each contract [Vol II, 3203 Management services (3), page 87]		Project Office Contractor	DoR-DCID-GESU / construction supervision consultant	Site visit and observation, Consultation with project personnel and workers	Reduced worksite risks	Daily

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
	due to exposure at worksite		Emergency procedure and contingency plan for each site.						
Equal opportunity and fair treatment at work	Influence on labour engagement and treatment at work.		▪ Introduce clause condition as per the borrower's requirement and domestic law during work agreement. ▪ Rate of wages and condition of work regarding minimum wage rate fixed by GoN and no discrimination in reference to national law (Labour Act, 2017). (Cl 6.2) Ensure equal wages for women and men at work.		Project Office Contractor	DoR-DCID-GESU / construction supervision consultant	Employment agreement/condition of contract	Avoid unfair treatment and discrimination at work	At the time of contract/ employment paper
Assessment of worksite/work zone risk and suggest control measures	Influence on OHS condition and health of the labours and personnels		▪ Carry out extensive worksite risk assessment in every six month or at least once at each site of less than 6 months. ▪ This includes measurement of the parameters like air, noise, heat, water, illumination etc. ▪ Suggest control hierarchy for potential risk prevalent in worksite. Provision against spreading of communicable diseases through establishing applicable measures at worksite like good sanitation, hygienic facilities, awareness,		Project Office Contractor	DoR-DCID-GESU / construction supervision consultant	Site visit and observation, OHS parameter measurement	Number of events carried out and status of OHS parameter in reference to national and international standard	Bi annually

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
			isolation to infected person and other local applicable measures.						
Compliance monitoring of Health and Safety obligations	Influence on OHS compliance performance at site		▪ Implementation plan for stipulated contract clauses. Provision of borrower's/ employer requirement such as Clause 4.8 (a - n), Cl 6.7, Particular Condition of contract, ESS2, Labour Act 2074, OHS Policy 2080 (Department level), OHS guideline 2080 (Department level) etc.) as condition of contract into bid document.		Project Office Contractor	DoR-DCID-GESU / construction supervision consultant	Field observation and verification	List of complianc es/nonco mpliance issues	Bi annually
Safety and security of project labour and personnels.	Influence of internal and external factors on health and employment	Work zone	▪ Plan for job security and health security including insurance. ▪ Job retention mechanism and practices Provision of worker welfare facilities (water & sanitation, labour camp, health examination, rest at work etc.) [Cl 6.6 page 40)]		Project Office Contractor	DoR-DCID-GESU / construction supervision consultant	Contract agreement	Improved performan ce of safety and security	Daily/as applicable
Institutional capacity building of project labours and personnels on OHS	Influence on OHS performance and increase in the rate to workplace		Training of contractor's personnel such as orientation, toolbox talk, emergency preparedness, road safety etc. [Cl 4.5, Cl 4.8 (h)]		Project Office Contractor	DoR-DCID-GESU / construction supervision consultant	Training/tool box/awarenes s/induction events	Improved workers/p ersonnel performan ce on OHS.	Daily/as applicable

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
	hazards and accident.								
Safety fencing /guard/barricade and signage to the worksite including machineries and hazardous processes	▪ Worksite injuries, illness and diseases. Influence on the traffic or public mobility	Work zone	▪ Safety fencing/guard/ barricade in all excavation, wall masonry work, bridge construction by safety net/ hard metal sheet/caution tape based on the nature of the work and indicated by OHS plan at worksite. Safety signage and boards at worksite at three places/stages like advance waring zone, transition zone and work zone.		Project Office Contractor	DoR-DCID-GESU / construction supervision consultant	Fencing of safety facilities at site	Reduced rate to accident and improved OHS performance at worksite.	Daily/as applicable
Assessment of health of project workers and personnels	Health status of workers and personnels before entering into the job and job placement based on health condition.		▪ Pre medical examination and self-declaration of health for fitting to the job and no chronic disease suspected. Annual health examination of workers and personnels.		Project Office Contractor	DoR-DCID-GESU / construction supervision consultant	Health examination record	Improved status of workers health	At work engagement and annually during employment
Housekeeping and material handling including heavy load and hazardous	▪ Influence of workers health ▪ Acquire extra effort, time		▪ Separate place for each material at worksite for good housekeeping. Mechanical handling of heavy materials such as use of trolley,		Project Office Contractor	DoR-DCID-GESU / construction supervision consultant	Field observation	Good housekeeping and mechanical handling practice at	Daily

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
material Cl 111 (10 & 2)	and cost during handling and housekeeping of materials. Congestion at worksite.		crane, loader.					site	
Accident reporting and management mechanism	Extra cost required for rescue and compensation on repetitive events at site.	All worksite	▪ Proper reporting based on the standard format developed by SRCTIP to explore root cause of each event. ▪ Introduce applicable measures at worksite based on the root cause analysis to avoid reoccurrence. ▪ Provision of work site first aid facilities and fist aidder as per the [Cl 111 (6) Cl 6.7 (FIDIC, 2017)] Provision of insurance for injury to employees (Cl. 19.2.5 FIDIC, 2017)		Project Office Contractor	DoR-DCID-GESU / construction supervision consultant	Number of accidents happened and reported	Number of accidents reduced	As applicable
Provision of Personal Protective Equipment (PPE) to all labours, supervisors and site staffs based	Potential risk to the health of the labour, personnels and visitors due to exposure to worksite	All worksites	▪ Use of PPE as per the nature of the work and season to all the labour, personnels and visitors while entering at site. PPE includes mask, helmet, boot, reflecting jacket/apron, safety belt,		Project Office Contractor	DoR-DCID-GESU / construction supervision consultant	Field observation	Number of PPE distributed and used	Daily

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
on the season and nature of the work [Cl 4.8 (i), No. 111 (10)]	hazard/risk that leads to accident, illness and diseases.		ear muff, globes, goggles etc.						
Child Labour and Forced Labour	Influence to legal compliance against prohibition of engagement of child labour, age under 14 years and forced Labour at work.		Avoid engaging child and forced labour in project through provision in contract prohibiting child labour for legal compliance as per the Labour Act 2074, Law related to Children 2075.		Project Office Contractor	DoR-DCID-GESU / construction supervision consultant	Field observation and employment records	Status of child and forced labour engagement records	Daily/ Monthly
Establishment of camp (work campsite and labour camp) (Cl 6.6) and Sub clause (Cl 111 (3)) – regarding provision and maintenance of camp	Influence on worker's health and work performance	Lot 3: Ch. 325+100	Provide labour camp facilities to all contracts including gsub contractor and labour contractors for direct and contracted labours and personnel as per the standard SRCTIP LMP standard.		Project Office Contractor	DoR-DCID-GESU / construction supervision consultant	Field observation and labour camp	Number of labour camp established	As applicable

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
Grievance management raised by workers (Cl. 4.20)	Worker confrontation/ grievance/disputes in project		▪ Listing of project related grievances raised by workers and project personnels. Formation of grievance redress mechanism at each contractor.						
Human management (Health and Safety) for OHS implementation and monitoring.	Implementation, compliance and monitoring of workplace hazard/risk for OHS performance.	Contractor office	▪ Engagement of OHS officer and inspectors for each contract. ▪ Engagement of responsible Staff and Labour [Cl 6.1- 6.12 page 39-42 (FIDIC, 2017)] Health and Safety, the minimum criteria set: Bachelor's Degree in relevant subject with 2 years of working experience. work volume II, Cl 3300, page 127		Project Office Contractor	DoR-DCID-GESU / construction supervision consultant	Engagement of health and safety personnels	Status of health and safety personnels mobilized	As applicable
Progress review and reporting of OHS status	Influence to the project performance	Contractor Office	Provision of monthly progress review and reporting to the employers with significant improvement on OHS at site. [(Cl 4.20) & Work requirement Vol II, 7 (b, c, d) (v) page 93, 94]		Project Office Contractor	DoR-DCID-GESU / construction supervision consultant	Copy of reports with OHS issues and improvement measures	Soft and hard copy of MPR in regards to OHS.	Monthly
Construction works, Labor camp (including kitchen, toilets, bathing facility),	GBV threat to Labor force, mostly female workers		Avoid Gender-based Violence through: • Targeted employment of women, poor and the excluded Gender specific facilities for labour workers. • Ensure equal wages for women		Project Office Contractor	DoR-DCID-GESU / construction supervision consultant	Field visits, interview, direct observations, verification and work progress	Healthy/ happy status of women workers,	Monthly

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
			and men The Contractor to develop a Worker Code of Conduct to govern the behavior of workers on-site, in camps, and in local communities, provide basic facilities for all workers and separate toilets & bathing rooms for women, IEC materials such as pamphlet, posters, hoarding boards, hot spot mapping, Coordination with OHS Expert/Officers for safety purposes.						
Gender Based Violence (GBV)/C/SEA/ SH risks	GBV and C/SEA/SH risks from labor force, lack of survivor centric services, lack of coordination and insufficient experts	-	For avoiding GBV, following measures will be adopted • Community sensitization. • Socio-economic development of women. • Orientation to labour force. • Code and conduct to guide the workers on how to relate with the community. • Orientation of Supervision Consultant, and Contractors on GBV/Gender/CSEA/SH • Mapping of local GBV service providers for prevention and responses. • Develop and implement a SEA/SH Prevention and Response Action Plan. • Hiring of GBV Service Providers • Orientation to GBV staff.		Project Office GBV service provider	DoR-DCID-GESU /	Field visits, interview, direct observations, verification and work progress	Healthy/happy status of women workers,	Monthly

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
			• IEC materials such as pamphlet, posters, hoarding boards, hot spot mapping. Coordination with OHS Expert/Officers for safety purposes.						
ESS 3: Resource Efficiency and Pollution Prevention Management									
Tree cutting within RoW, possibility of conversation of agricultural land into built up areas, impacts on existing ponds along the roadside, vegetation clearing due to stockpiling of materials	Land use change		• Compensatory plantation in coordination with DFO. • Maintaining greenery within median and road side • Management of RoW • Enhancement of existing ponds along roadside • Initiation for policy development for land use classification and protection of agriculture land • proper stockpiling of construction materials in specified locations only and management of quarry and burrow pits • Reinstate of quarry sites and burrow pit areas	Included in BoQ	Project Office/ Contractor/ DoFSC/ DFOs	DoR-DCID-GESU / Supervision Consultant Department of Environment	Site visit and observation	Number of trees, locations, budget	Annually
Use of borrow pit and stockpiling of materials along road side of KDP	Loss of productive topsoil Impact on agro-production, loss of vegetation and		• Location of borrow pit and stockpiling of materials will be kept away from the productive agricultural land • Collection and preservation of topsoil • Turfing/bioengineering along road embankment	Included in BoQ	Project Office/ Contractor/	DoR-DCID-GESU / Supervision Consultant	Site visit and observation	Top soil preservation practice and overlaying of top soil during backfilling	Monthly

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
	forest								
Construction of roads and bridges, Operation of burrow pit, quarry sites crusher, hot mix and batching plants, Chemical hazards (by bitumen and other toxic and hazardous chemicals	Air, water and noise pollution, impact to aquatic habitat, forest resources and human health		• Use of good condition vehicles and equipment for the project • Sprinkling of water along the dusty road during construction as per requirement (once or more times). • Transporting construction materials by covering it properly • Operation of drill machines, excavators, loading and unloading of waste materials will not be carried out during school hours • Use of dust mask to the workers • Proper barricade of construction area • Use of ear muffs to construction workers to minimize impact of noise during use of drill machines, excavators, loaders etc. • Scheduling construction works (mainly near schools and hospital areas)		Project Office/ Contractor	DoR-DCID-GESU / Supervision Consultant	Site visit and observation	Number of plants, number of locations, regular monitoring of air, noise and water quality parameters	Monthly

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
			• Provide operational schedule to local inhabitants. • Obtain permission from local stakeholders, Municipality for establishment of quarry sites crusher, hot mix and batching plants, • proper implementation of Standard Operating Procedures for Pollution Spills and Management of Fuels and Hazardous Substances • Crusher batching and asphalt plant will be kept away from the water bodies (rivers, ponds, spring water sources) for minimizing impact to aquatic habitat Regular monitoring of air and water quality will be carried out in nearby locations of those plants						
Stockpiling of Construction Materials	Dust emission, washout affect to the natural drainages &	238+030 to 260+100	• Obtain written permission from landowners and local bodies for stockpiling on their land. • Barricade the locations Stockpile will not be located	Included in BoQ	Project Office/ Contractor	DoR-DCID-GESU / Supervision Consultant	Site visit and observation	Number of plants, number of locations, regular monitoring of air, noise	Monthly

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
	cultivated areas, and discomfort in mobility to road users		on water courses; will not be within 50m of schools, hospitals or public standpipes; Forest areas and will not affect locals and their properties; • Stockpiles will be covered with tarpaulins. For large stockpiles, it will be enclosed with side barriers and also covered when not in use. • Hard surface will be prepared for chemical hazard materials store to prevent the contamination/leakage in the soil Restoration of the site after use.					and water quality parameters	
Water logging	Water logging due to blockage of drainage and insufficient drainage, capacity and improper waste disposal, spread of		• proper cross drainage and road drainage structures have been designed • existing causeways will be converted int the box culverts for the proper crossing of the drainage dryness of the logged areas and probit mobility of local people and also spread of pesticide to control vector borne diseases	Included in BoQ	Project Office/ Contractor	DoR-DCID-GESU / Supervision Consultant	Site visit and observation	Number of plants, number of locations, regular monitoring, budget	Monthly

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
	vector borne disease, contaminate nearby water bodies								
Greenhouse Gas (GHG) Emission and climate change	GHG emission from construction activities and impact to local communities and biodiversity, cloud burst and unusual precipitation/ sedimentation		• Recommendations for fuel efficient machinery • Carbon offset by planting trees • cross drainage structures (including bridges) along roadside has been designed with 20% more discharge and precipitation on maximum discharge and precipitation over 100 year return period • river training works are proposed for rivers with bank cutting and flood prone areas	Included in BoQ	Project Office/ Contractor	DoR-DCID-GESU / Supervision Consultant	Site visit and observation	Record of past Natural disasters	Quarterly during Construction
Solid waste	Waste, health and hygiene to locals and road users.		• proper solid waste management in place using separate dustbins for degradable and non-degradable waste • Awareness training on waste management to the workers	Included in BoQ	Project Office/ Contractor	DoR-DCID-GESU / Supervision Consultant	Site visit and observation	Number of bins Training and awareness	Monthly
ESS 4: Community Health and Safety									
Traffic management	Accidents, Traffic jams,		▪ Traffic management plan incorporating contraction and	Included in BoQ	Project Office/ Coordinator	DoR-DCID/ Supervision	Developed plan and field	Number of	Regular

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
during construction	noise, air and dust pollution etc		operation of the project to avoid unmanaged traffic situation through traffic signage, traffic diversion, alternate routes, speed limit, safety barricade, worksite instruction etc. under (Cl.4.21) ▪ Identification of high-risk zone and vulnerable traffic zone applicable to project. ▪ Barricade and work zone separation in excavation, wall masonry work, bridge construction (Vol II, 125 Site Safety, page 24). ▪ Safety signage and boards at worksite at three places/stages like advance waring zone, transition zone and work zone (Vol II, Work requirement page 10). ▪ Provision of traffic management facilities like flag man, traffic light, rescue van and healthcare facility. ▪ Training and awareness to the stakeholders like workers, driver, engineer, traffic police and first aider/rescue team on TMP, potential risk and their role at site. Vehicle management system to all			Consultant / Traffic Police	verification	facilities establishe d and number of events carried out	

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
			contraction related vehicle						
Construction work station	Impact in community mobility and road users' safety		▪ Provision of safety barricade, metal crossing, safety signage/ information, awareness and footpath to the road users. ▪ Safe operation of vehicle of all categories. ▪ Avoid public entry in construction sites	Included in BoQ	Project Office/ Coordinator	DoR-DCID/ Supervision Consultant	Developed plan and field verification	Improved condition of road /traffic safety	Regular
Management of Labour Influx	Impact on local resources, communicable diseases and risk to community	Construction site and labour camp	▪ Establishment of labour camp only at designated location as mentioned above and distanced from the local settlements. ▪ Community awareness programs on construction-related hazards, including awareness programs in schools, construction activities such as excavation, bridge foundation particularly and the areas, may pose safety risks to the nearby people. ▪ Provision of facilities to avoid the spreading of communicable/ sexually transmitted diseases such as HIV/AIDS. diseases among the workers and community people.	Included in BoQ	Project Office/ Contractor	DoR-DCID/ Supervision Consultant	Number of awareness programs and events	Monitoring reports and improved condition of labour influx.	Once in every Six month.

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
			▪ Engagement of local labours and construction resources as much as possible during work. ▪ Strengthening and collaboration with the local health facility and onsite primary health care facility or surveillances Introduce worker Code of Conduct develop by SRCTIP -KDB road section.						
Management of communicable disease	Threat to the labour and community people by communicable diseases	All construction site and labour camp	▪ Introduce good hygiene and sanitation facilities and practices at worksite and labour camp. ▪ Provide first aid facilities and first aider at each camp and work site. ▪ Isolation room for infected persons. ▪ Awareness to all community regarding the potential risk of communicable diseases and their prevention. MoU to the nearby hospitals	Included in BoQ	Project Office/ Contractor	DoR-DCID/ Supervision Consultant	Number of facilities available at site and camp	Records of previous and present cases on the communicable diseases events.	Regular
Human Trafficking	Threat to community people, mostly female		▪ Community awareness and sensitization with emphasis to women and young girls.	Included in BoQ	Project Office/ Contractor/GBV Service Provider	DoR-DCID/ Supervision Consultant / Nepal Police	Field visits, interview and verification	Living status of women workers community due to	During construction

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
	workers of local and outside		▪ Training and awareness regarding trafficking and self-security. ▪ Coordination with organizations working on anti-trafficking within project area ▪ Vigilance from law enforcement authority and compliance with the labour laws. ▪ Display of hoarding boards about anti trafficking.					implementation of project	
ESS 5: Land Acquisition Restrictions on Land Use and Involuntary Resettlement									
Temporary land requirement for establishments of labor camp, work camp, stockpiling sites, asphalt/batching concrete etc	Construction induced impacts on crops, or private/ agricultural land temporarily		• Avoid agricultural land as possible, if cannot avoidance then the land will be used on leased basis, • Damaged/loosed crops, will be compensated as part of construction induced impact, the procedures for construction induced impact is clearly mentioned in RAP • Legal permission and approval process will be carried out and MoU with land owners and concerned parties • Site-Specific Rehabilitation and Reinstatement Plan will be developed by the contractor just after joint survey and MoU with	Project Office/ Contractor	DoR-DCID/ PIC/ Supervision Consultant	Visit the sites and field observation	Reinstated sites and cash payment Voucher for crop loss	Monthly	Project Office/ Contractor

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
			concerned party if require (Annex 7.7) Rehabilitation and Reinstatement plan will be implemented.						
Acquisition of private / public structures as part of formation width clearance.	Damage of 66 private structures of 64 HHs Economic displacement Impact on livelihoods		Developed Resettlement Action Plan (RAP) Cash compensation at replacement cost Business disturbance assistance Rental and shifting assistance Displacement and dismantling assistance Provision of livelihood restoration training	Project Office/ Contractor	DoR-DCID-GESU / Supervision Consultant / CDC / DLSO / DLRO / DUDBC / concerned line agencies/ local people	Review of RAP and IPDP reports Review of compensation payments summary reports Observe ongoing livelihoods restoration trainings Site visit and observation	Allocated budget, Checking received cash and Voucher / Training number Health /	Monthly	Project Office/ Contractor
	Impacts on 84 public and community structures / /waiting sheds Police/Army check post		Relocation and rehabilitation measures with appropriate remedial relocation plan will be develop Community consultation and suggestion.	Project Office/ Contractor	DoR-DCID-GESU / Supervision Consultant / DUDBC / local authority/concerned line agencies	Review of appropriate remedial relocation plan and progress report Site visit and	Allocated budget, Number of remedial plan, and Community consultation		Project Office/ Contractor

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
						observations	minutes		
Relocation and Rehabilitation activities within RoW	Impact on public utilities like electric poles, NTC fiber nets, internet wire, solar poles and drinking water pipelines & Irrigational cannels		Coordination with concerned line agencies like NEA, Telecom, DWSS DoI and private internet partners Request for cost estimation and reports Develop and sign MoU Shifting, relocation and rehabilitation Plan Consultation with concerned agencies	Project Office/ Contractor/NEA/NTC	DoR-DCID-GESU/ Supervision Consultant	Review final reports prepared by concerned parties and allocated budget Site visit and observations	Number of plan Number of Beneficiaries Consultation minutes	Quarterly	Project Office/ Contractor/ NEA/NTC
Road and Bridge construction works	Crack in structures, land, or public and private properties as part of construction induced impacts		Applicable procedures mentioned in ESIA and RAP Route cause analysis report	Project Office/ Contractor	DoR-DCID-GESU/ Supervision Consultant	Site visit and observations	Budget Rehabilitation work	As when required	Project Office/ Contractor
ESS 6: Bio-diversity conservation and sustainable management of living natural resources									
Cutting of Trees within	Loss of forest area		• The upgrading works will be carried out within the	Included in	Project office/ contractor/DFO	DoR, DCID, Construction	Site visits and observation,	Number of marked	Monthly (During &

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
the RoW	and vegetation and impact on forest of RoW and adjoining areas		formation width (FoW) and tree only within FoW will be removed (as per detailed design) • Compensatory plantation in ratio 1:10 with caring for five years will be done as per forest regulation 2022 Maintaining greenery within median and road side	BoQ	and DoFSC	& Supervision Consultant, GESU-DoR, DoFSC, Department of Environment	number, budget	trees, budget, location of planation	after construction)
Wildlife movement	Impact on Wildlife movement	292+703	• Annual maintenance of river/stream bed level and banks for facilitating animal movement. • Culverts will be constructed with shelves, elevated concrete walkways, and docks for facilitating movement of insects, reptiles and amphibians even during rainy season. Speed breakers/rumble strips, roadside reflectors and mirrors, signage, variable message sign, will be adopted to facilitate animal movements	Included in BoQ	Project office/ Contractors,	DoR- DCID,/ Supervision Consultants, DFO	Field visits and observations, numbers. Budget,	Locations	Monthly
Threat to Aquatic habitat	Impacts on aquatic biodiversity		• Crusher, batching and asphalt plant will be kept away from the water bodies	Included in BoQ	Project office/ Contractors	DoR- DCID, Supervision Consultants,	Field visits and	Number of Locations,	Twice in a month

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
	at Perennial Water-bodies along KDP road		(rivers, ponds, spring water sources) for minimizing impact to aquatic habitat • Regular monitoring of air and water quality will be carried out in nearby locations of those plants • Watercourse diversions will be maintained during construction of bridges Drains along the road side and open field ditches will be be piped/culverted will be diverted into the specified drainage			DFO	observation	number of trainings	
Threat to wildlife, hunting and poaching	Impacts and threats to wildlife along KDP road		• Formation of rapid response wildlife management unit in coordination with DFO • Instructions and orientation to workers through biodiversity expert/advisor Wildlife monitoring Awareness campaigns/Training and capacity building	Included in BoQ	Project office/ Contractors	DoR- DCID, Supervision Consultants, DFO	Field visits and observation,	Number of Locations, number of trainings, budget	Twice in a month
Illegal use of forest resources	Impact to the forest resources due to activity of workers during		• Alternative source of energy will be provided in labour camps to avoid use of firewood for cooking at Labor Camps		Project office/ Contractors	DoR- DCID, Supervision Consultant/ DFO, CFUG	Field visits and observation,	Number of Locations, budget	Once in a month

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
	construction		• Workers will be prohibited inside forest area and works will be confined only within ROW of KDP road. Smoking will be prohibited while working in areas adjoining to forest patches						
Cutting of Trees within the RoW	Loss of forest area and vegetation and impact on forest of RoW and adjoining areas		• The upgrading works will be carried out within the formation width (FoW) and tree only within FoW will be removed (as per detailed design) • Compensatory plantation in ratio 1:10 with caring for five years will be done as per forest regulation 2022 Maintaining greenery within median and road side	Included in BoQ	Project office/ contractor/DFO and DoFSC	DoR, DCID, Construction & Supervision Consultant, GESU-DoR, DoFSC, Department of Environment	Site visits and observation, number, budget	Number of marked trees, budget, location of planation	Monthly (During & after construction)
ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities;									
Clearance of formation widths and IP communities near by project area	Impact on 14 IPs households Indirect impact near by IPs Communities		Compensation at replacement cost Developed Indigenous Peoples Development Plan (IPDP) Health outreach program Promotion of indigenous knowledge and practice	Included in RAP Included in	Project Office/ Contractor	DoR-DCID-GESU/ Supervision Consultant	Review of health outreach program report Site visit and observe market place	Number of conducted health outreach program Number of market	Annually

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
			Enhancement of 1 market place Enhancement of Than,	IPDP & BoQ			public toilets	place and toilets Number of indigenous promoted products Number of enhanced than, Gumbas and ponds	
ESS 8: Cultural Heritage:									
Acquisition of private / public structures as part of formation width clearance.	Impact on 35 Small temples/shrines / 55 religious trees / Chautaras		Relocation and rehabilitation measures with appropriate remedial relocation plan will be develop Community consultation and suggestion Performed necessary rituals before relocation/removal of tree	Part of project cost	Included in BoQ	Project Office/ Contractor	DoR-DCID-GESU / Supervision Consultant/ Temple management committee	Reviewed of developed remedial relocation plan Community consultation meetings Site visits and	Progress reports Number of rehabilitation relocation sites Number of Chautaras

Activity	Impact and Issues	Location	Mitigation Measures	Cost	Responsibility / Monitoring				
					Implementation	Monitoring / Supervision	Verification methods	Indictors	Frequency
								observations	
ESS 9: Financial Intermediaries:									
Not Applicable here									
ESS 10: Stakeholder Engagement and Information Disclosure:									
Lodged Grievances by community	Issues related private and public property loss, damages due to construction and labor influx related issues GBV/SEA/SH related issues		Provision of Project GRM along with Workers GRM and CSEA/SH GRM Development of Separate (workers and CSEA/SH GRM concept note Keeping records and resolution of public grievances Acknowledge and disclose the grievances publicly	Included in RAP	Project Office/ Grievance Redress Committee/ Contractor	DoR-DCID-GESU-local bodies	Review of resolution process Site visit and observation	Number of received & resolved grievances	Monthly

Section VII E – Drawings

Provided as Section VII E in a separate volume.

Please refer DoR website:
https://www.dor.gov.np/home/publication/report-of-project-under-srctip-dcid

Section VII F: Supplementary Information Regarding Works to Be Procured

Upgrading of Kamala-Bagmati Section of East-West Highway,) under Strategic Road Connectivity and Trade Improvement Project.

East-West Highway is the only major highway which accommodates all types of commercial vehicles and connects from East to West with other parts of the country. So this road cannot be fully closed for traffic. Contractor shall prepare the work program keeping in view of this situation and adequate provision of traffic management has to be considered in the proposal.

The contractor shall always keep one lane open to traffic throughout the construction. Under exceptional circumstances, when full closure of traffic lanes cannot be avoided for certain operation of construction, the Contractor shall inform the Employer and the Engineer and submit proposal for road closure and traffic management, indicating time period and work program. The Engineer will review the proposal and if satisfied, may allow to close the particular section of the road with the approval of the Employer, for a period of maximum of 30 minutes at a time. Contractor will be fully responsible to manage the construction work during such difficult situation.

This road section starts at Km 260+100 and ends at Km 289+840 of Mahendra Highway (East West Highway).

The Works under this Contract consist of:

Phase 1: Upgrading Works; with Upgrading of existing road from 2-Lanes to 4 Lanes and Service Lanes, Structures and Construction of Bridges, etc. including Defect Notification Period; and

Phase 2: Performance Based Maintenance Works; with Maintenance works consisting of all activities to be carried out to achieve and keep the road assets as defined in the PBM Specifications on upgraded 4-Lane Kamala-Bagmati Road Section of East-West Highway.

The Detail Drawings related to the Upgrading works have been included as **Section VII D** and provided in a separate volume. The estimated quantities of individual work items are contained in the Bill of Quantities. Description of works, materials, and workmanship, methods of testing and requirement and criteria for acceptance of Works etc. are detailed in the Standard Specifications and Special Provisions to the Standard Specifications in **Sections VII B** and **VII C** respectively. The Bidders shall make their own investigations, assessment and judgment with regards to the location and quantity of suitable local construction materials. The Employer shall take no liability for any conclusion inferred by the Bidder.

The Summary Description of the main works, however, is as follows:

i) Traffic management provisions during construction including the construction of diversions roads and bridges;
ii) Roadway excavation and formation of embankment for widening of road section and for geometric improvement of road;
iii) Construction of side drains, retaining structures;
iv) Construction of cross-drainage structures;
v) Construction of sub-base, base and bituminous pavement;

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Project Director

vi) Supply, erection and installation of road safety measures,
vii) Construction of bridges and their elements;
viii) Construction of overpasses, underpasses and fly overs;
ix) Dismantling of existing RCC bridges;
x) Performance based maintenance works to achieve and keep the road assets as defined in the PBM Specifications, etc.

Construction Period

The total contract duration will be 8 years including 3 years of construction/ upgrading under Phase 1 and 5 years of Performance Based Maintenance period under Phase 2 (including DNP of Phase 1).

In addition to above following supplementary information shall apply:

Special Operation Procedure (SOP)

Put in place preventive as well as response management measures following the Standard Operation Procedure (SOP) and Protocol issued by the competent authority and the Good International Industry Practice (GIIP) against the spread of COVID-19 and other communicable diseases among workers on site.

In response to COVID-19, countries across the globe have implemented a range of public health and social measures, including movement restrictions, partial closure or closure or closure of schools and businesses, quarantine in specific geographic areas and international travel restrictions. Alike global condition Nepal is also suffering with rapid transmission of COVID 19 cases in recent days which seems to be continuous for long run. World Bank (WB), Nepal Government (GoN) as well as World Health Organization (WHO) has established their own measures to be followed for construction sites. Hence, there are several standard procedures by different organizations to perform construction work at controlled environment with reduced transmission capability of COVID-19 in workplace so that construction work will not be vanished. Here the bidder should offer their modality to work in COVID-19 condition ensuring safe environment in terms of its transmission. For this purpose, the bidder shall prepare detail SOP based on the best practical and effective measures considering the guideline of GoN, WHO as well as WB without limiting to the following mentioned sectors.

Workplace risk assessment

Please categorize the working areas in to different category based on exposure risk. *Low exposure risk* - Workers in this category have minimal occupational contact with the public and other co-workers.

Medium exposure risk- In areas without community transmission of COVID-19, the scenario may include frequent contact with persons returning from areas with community transmission.

High exposure risk- jobs or work tasks with high potential for close contact with people who are known or suspected of having COVID-19, as well as contact with objects and surfaces possibly contaminated with the virus.

Measures for All Workplaces

Include your proposal for preventing transmission of COVID-19 that apply to all workplaces and all people at the workplace, such as employers, managers, workers, contractors, customers and visitors, include the following:

Dr. Bijaya Jaishi
Project Director

Broad provisions for preventing transmission through following measures.

- Hand hygiene
- Respiratory hygiene
- Physical distancing

General provision for Preventing Transmission in Office

- Reduce and manage work-related travels
- Regular environmental cleaning and disinfection
- Cleaning and disinfecting office
- Office arrangement
- Staff management
- Staff behavior

  I. Physical Distancing

  II. Personal Hygiene

  III. Meeting Etiquette

  IV. Visiting Site or Client's Office

Commencement of Work in Construction Sites

- Preparation before work
- Procedure to be followed at entry
- Measure to minimize worker and community contact
- Restriction of workers movement outside the camp
- Disinfection of plant machineries
- Batching plant site (enclosed area)
- Manage delivery Zones
- Manage storage area
- Personal protective equipment
- Manage workers accommodation (permanent and make-shift camps)

  I. Camp Arrangements
  II. Kitchen and Dinning
  III. Toilets
  IV. Changing Facilities and Showers

Emergency Handling Protocol (Covid-19)

- Emergency response team
- Preparedness for emergency
- Emergency protocol for symptomatic case
- Management of people with COVID-19 or their contacts

Specific Measures for jobs Based on Risk Level

- Workplace and jobs at medium risk
- Workplace and jobs at high risk

SOP Implementation, Internal Monitoring and Reporting Mechanism

- Organogram for SOP implementation
- Internal monitoring and reporting mechanism
- Risk communication, training, and education
- Right, duties and responsibilities of workers and employers.

Section VII G – Personnel Requirements

Phase1

Phase 1: Upgrading Works

Using Form PER-1 and PER-2 in Section 4 (Bidding Forms), the Bidder must demonstrate that it has Personnel who meet the following requirements:

S.N	Position	Nos.	Academic Qualification	Years Of Relevant work Experience
1	Contractor's Representative/ Contract Manager	1	Bachelor's Degree in any discipline	a. The Contractor's representative shall be a full-time employee of the Bidder (in the case of joint ventures, of the Lead Member) for at least 1 year prior to the date of bid submission deadline. b. 10 years working experience on construction Contracts. c. Should be proficient in English.
2	Highway Engineer/ Civil Engineer	1	Bachelor's Degree in Civil Engineering/Highway Engineering or equivalent	5 years working experience on Road Contracts of similar nature.
3	Structural/ Bridge Engineer	1	Bachelor's Degree in Civil Engineering/Bridge Engineering or equivalent	5 years working experience on bridge/structural works.
4	Environment Specialist	1	Bachelor's Degree in environmental subject.	3 years working experience on environmental safeguard works.
5	Health and Safety	1	Bachelor's degree in relevant subject	2 years working experience on health and safety works.
6	Social Safeguard Specialist		Bachelor's degree in social or relevant subject	2 years working experience on social

				safeguard works

The Bidder shall provide details of the proposed personnel and their experience records in the relevant Information Forms included in Section 4 (Bidding Forms).

All submitted curriculum Vitae should be duly signed by the concerned person.

Phase 2

Phase 2: Performance Based Maintenance Works

Using Form PER-1 and PER-2 in Section 4 (Bidding Forms), the Bidder must demonstrate that it has Personnel who meet the following requirements:

S. No.	Position	Required Nos.	Minimum Qualification	Relevant Work Experience [years]
1	Contract Manager / Contractor's Representative/ Performance Manager	1	BE in Civil Engineering/ Construction Management	10
2	Maintenance Engineer	1	BE in Civil Engineering	5
3	Sub Engineers	2	Diploma in Civil Engineering or equivalent	3

The Bidder shall provide details of the proposed personnel and their experience records in the relevant Information Forms included in Section 4 (Bidding Forms).

All submitted curriculum Vitae should be duly signed by the concerned person.

Dr. Bijaya Jaishi
Project Director

Section VII H – Equipment Requirements

Using Form EQU in Section 4 (Bidding Forms), the Bidder must demonstrate that it has the key equipment listed below:

S. No.	Equipment Type and Characteristics	Minimum Number Required
1	Pneumatic Roller (> 8 Ton)	5
2	Concrete Batch Plant (> 50 m3/hour)	2
3	Concrete Mixer Truck: (>5 m3)	5
4	Asphalt Plant (>90tonne/hour)	2
5	Asphalt Paver with Electronic Sensor (> 3.0 m)	3
6	Crane (>40tonne)	2
7	Grader	4

The Bidder shall provide further details of proposed items of equipment using the relevant Form in Section 4 (Bidding Forms).

Ownership attestation documentation for each item of equipment and, where, relevant, the original leasing agreements should be attached.

Resources committed by the Bidder should be physically mobilized at site throughout the contract period.

Government of Nepal

Ministry of Physical Infrastructure and Transport

Department of Roads

Development Cooperation Implementation Division

Kathmandu, Nepal

Strategic Road Connectivity & Trade Improvement Project

(WB Credit No.6673 –NP and 6674-NP)

Upgrading of Mahendra Highway

Kamala-Dhalkebar- Bagmati Road Section

(Km 238+030 to km 312+785)

Contract No.: SRCTIP-DOR-W-KDP-ICB-4 (Comprising Lots 1, 2 and 3)

Phase 1 Upgrading Works:

(Upgrading of existing road from 2-Lanes to 4 Lanes and Service Lanes, Structures, Bridges, etc. including Defect Notification Periods)

Phase 2: Performance Based Maintenance Works

(Maintenance works consisting of all activities to be carried out to achieve and keep the road assets as defined in the PBM Specifications)

Bidding Document

For

Lot 3 (Km 289+840 to Km 312+785)

Part 3 – CONDITIONS OF CONTRACT AND CONTRACT FORMS

Section VIII - General Conditions (GC)
Section IX - Particular Conditions (PC)
Section X - Contract Forms

March, 2024

Request for Bids Works

Upgrading of Mahendra Highway
Kamala-Dhalkebar- Bagmati Road Section
(Km 238+030 to Km 312+785)

Contract Identification No.**SRCTIP-DOR-W-KDP-ICB-4(Lot 1,2 and 3)**

Lot 3 (Km 289+840 to Km 312+785)

Preface

This Bidding Document for the Procurement of Works (Request for Bid, Works – Without Prequalification) has been prepared by the Government of Nepal, Ministry of Physical Infrastructure and Transport, Department of Roads, Development Cooperation Implementation Division and is based on the Standard Procurement Document Request for Bids (Without Prequalification and Where Bank's disqualification mechanism for non-compliance with SEA/SH obligations Does Not Apply)" issued by the World Bank dated January 2021.

WB's SPD Works has the structure and the provisions of the Master Procurement Document entitled "Bidding Documents for the Procurement of Works", which form part of the "Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer ("Red book") Second edition 2017" published by the Federation Internationale Des Ingenieurs – Conseils (FIDIC) and the following "Particular Conditions" except where WB-specific considerations have required a change.

Standard Procurement Document
Summary

Bidding Document: Request for Bids – Works (Without Prequalification)

PART 1 – BIDDING PROCEDURES

Section I - Instructions to Bidders (ITB)

This Section provides relevant information to help prequalified Bidders prepare their Bids. It is based on a one-envelope Bidding process. Information is also provided on the submission, opening, and evaluation of Bids and on the award of Contracts. **Section I contains provisions that are to be used without modification.**

Section II - Bid Data Sheet (BDS)

This Section includes provisions that are specific to each procurement and that supplement Section I, Instructions to Bidders.

Section III - Evaluation and Qualification Criteria

This Section specifies the criteria to determine the Most Advantageous Bid.

Section IV - Bidding Forms

This Section includes the forms for the Bid Submission, Bill of Quantities, Schedules of technical proposal, including technical and financial qualifications, personnel, financial resources, and equipment, Bid Security and others to be completed and submitted by the Bidder as part of its Bid.

Section V - Eligible Countries

This Section contains information regarding eligible countries.

Section VI - Fraud and Corruption

This Section includes the Fraud and Corruption provisions which apply to this Bidding process.

PART 2 – WORKS' REQUIREMENTS

Section VII - Works' Requirements

This Section specifies the Scope of Works, Specification, the Drawings, and supplementary information that constitute the Works' Requirements for the Works to be procured. The Works' Requirements also include the environmental and social (ES) requirements (including requirements relating to Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) which are to be satisfied by the Contractor in executing the works.

Section: VII A Standard Specifications
Section: VII B Special Provisions to Standard Specifications
Section: VII C Environmental and Social Management Plan (ESMP)

Section: VII D Drawings (In Separate Volume)
Section: VII E Supplementary Information Regarding Work to be Procured
Section: VII F Personnel Requirements
Section: VII G Equipment Requirements

PART 3 – CONDITIONS OF CONTRACT AND CONTRACT FORMS

Section VIII - General Conditions (GC)

This Section refers to the "General Conditions" which form part of the Conditions of Contract for Construction (Second Edition 2017) published by the Federation Internationale Des Ingenieurs – Conseils (FIDIC).

Section IX - Particular Conditions (PC)

This Section includes particular conditions of the contract consisting of: Part A-Contract Data; Part B -Special Provisions, PART C – Fraud and Corruption; and PART D – Environmental and Social (ES) Reporting Metrics for Progress Reports. The contents of this Section supplement the General Conditions and shall be completed by the Employer.

Section X - Contract Forms

This Section contains the Letter of Acceptance, Contract Agreement and other relevant forms.

PART 3 – Conditions of Contract and Contract Forms

Section VIII - General Conditions (GC)

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" 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.

International Federation of Consulting Engineers (FIDIC)

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Section IX - Particular Conditions of Contract

The following Particular Conditions shall supplement the General Conditions. Whenever there is a conflict, the provisions herein shall prevail over those in the General Conditions.

Dr. Bijaya Jaishi
Project Director

Particular Conditions

Part A – Contract Data

Conditions	Sub-Clause	Data
Where the Contract allows for Cost Plus Profit, percentage profit to be added to the Cost	1.1.20	5%
Employer's name and address	1.1.31	The Employer is: **Department of Roads,** **Development Cooperation Implementation Division,** **Strategic Road Connectivity & Trade Improvement Project** **Babarmahal, Kathmandu** Employer's Representative is: **Project In Charge (PIC),** **Strategic Road Connectivity & Trade Improvement Project**
Engineer's name and address	1.1.35	To be named later
Works	1.1.87	Delete the sentence and insert the following: "Works" mean the Permanent Works, The Temporary Works and Performance Based Maintenance Works.
Bank's name	1.1.89	The World Bank
Borrower's name	1.1.90	Government of Nepal
Time for Completion	1.1.84	**Phase 1-** Upgrading Works: **1095 days** **Phase 2-** Performance Based Maintenance Works: **1825 days** (including Defects Notification Period for Phase 1).
Defects Notification Period	1.1.27	**For Phase 1: Upgrading Works - 365 days** **For Phase 2: Performance Based Maintenance Works -** Not applicable
Sections	1.1.73	Not Applicable
Site	1.1.74	*Kamala-Dhalkebar- Bagmati Road Section (Km 238+030to km 312+785) of Mahendra Highway (for Lot 1:- 238+030 to 260+100, for Lot 2:- 260+100 to 289+840 and for Lot 3:- 289+840 to 312+785)*
Construction Phase Works	1.1.93	Add Sub-Clause 1.1.93 "Construction Phase Works" means the Phase 1: Upgrading Works to be executed by the Contractor.
Maintenance Phase Works	1.1.94	Add Sub clause 1.1.94

Conditions	Sub-Clause	Data
		"Maintenance Phase Works" means the Phase 2: Performance Based Maintenance Works to be executed by the Contractor.
Electronic transmission system	1.3 (a) (ii)	E-mail can be used as electronic transmission for communication. The electronic transmission shall be deemed effective provided the original is hand delivered (against receipt) within a week.
Address of Employer for communications:	1.3(d)	Department of Roads, Development Cooperation Implementation Division, **Strategic Road Connectivity & Trade Improvement Project** Babarmahal, Kathmandu Email: *dorfcb@dor.gov.np*
Address of Engineer for communications:	1.3(d)	to be notified later
Address of Contractor for communications:	1.3(d)	to be notified later
Governing Law	1.4	Law of the Government of Nepal
Ruling language	1.4	English
Language for communications	1.4	English
Priority of Documents	1.5(i)	Replace "the Schedules" by "the Schedules or Bill of Quantities (BOQ)"
Time for the Parties to sign a Contract Agreement	1.6	Within 35 days after receipt of Letter of Acceptance
Number of additional paper copies of Contractor's Documents	1.8	2 (Two)
Total liability of the Contractor to the Employer under or in connection with the Contract	1.15	The Product of 1.15 times the Accepted Contract Amount
Time for access to the Site	2.1	The right of access to the site: **At Commencement Date.** However, the possession to site shall be given in stages as below: 60% of site at Commencement Date and remaining 40% of site from 3 month of commencement date.
Employer's Supplied Materials and Employer's Equipment	2.6	Special Provisions under Sub-Clause 2.6 – Applicable.

Conditions	Sub-Clause	Data
Engineer's Duties and Authority	3.2	All Variations resulting in an increase of the Accepted Contract Amount shall require written consent of the Employer. Modify the first paragraph of Special Provisions as under: The Engineer shall obtain the consent in writing of the Employer before taking action under the following Sub-Clauses of these Conditions: (a) Sub-Clause 5.1: Approving sub-contracting (b) Sub-Clause 8.5: Extension of Time for Completion (c) Sub-Clause 10.1: Taking Over the Works and Sections (d) Sub-Clause 12.3: Fixing a new rate or price (e) Sub-Clause 13.1: Right to vary - instructing a variation, except in an emergency situation as determined by the Engineer (f) 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.
Contractor's General Obligations	4.1	Add at the end of 2nd paragraph as: "The Contractor shall prepare site-specific working/ shop drawings based on the standard design /drawings provided in the Contract or modified by the Engineer, whether of a temporary or permanent nature. These documents shall be submitted to the Engineer for Review and approval as per Sub Clause 4.4.1 [Preparation and Review].
Performance Security	4.2	The Performance Security will be in the form of a *demand guarantee* in the amount(s) as specified below in the same currency (ies) of the Accepted Contract Amount: The Contractor shall prepare THREE separate performance securities: (i) One with the value of 7.5% of the Accepted Contract Amount having validity period up to the completion of Defect Notification Period of Phase 1 (Improvement /Construction Work) plus 28 days; and

Conditions	Sub-Clause	Data
		(ii) Another with the value of 1% of the Accepted Contract Amount having validity period up to issue of the Performance Certificate of Phase 2 plus 28 days. (iii) Another with the value of 1.5 % of the Accepted Contract Amount towards Environmental and Social (E&S) Performance Security having validity period up to the completion of Defect Notification Period of Phase 1 (Improvement /Construction Work) plus 28 days If the Performance Security is issued by a bank located outside Nepal, it shall be counter guaranteed by a commercial bank established in Nepal.
Contractor's obligations	4.2.1	Insert the following paragraph at the end of the Special Provisions: In the second paragraph immediately after "Certificate" add "for the Phase 1: Improvement/Construction Work and Phase 2: Performance Based Maintenance Works"
Return of Performance Security	4.2.3	Insert the following paragraph at the end of the Special Provisions: "Performance security of 7.5% of the Accepted Contract Amount shall be returned within 28 days after the issue of the performance Certificate of Phase 1 and the contractor has complied with Sub-Clause 11.11 [Clearance of Site]; " Environmental and Social (E&S) Performance security of 1.5% of the Accepted Contract Amount shall be returned within 28 days after the issue of the performance Certificate of Phase 1 and the contractor has complied with Sub-Clause 11.11 [Clearance of Site]; "Performance security of 1% of the Accepted Contract Amount shall be returned within 28 days after the issue of the performance Certificate of Phase 2 and the contractor has complied with all obligations of the Contract including Sub-Clause 11.11 [Clearance of Site]; or"

Conditions	Sub-Clause	Data
Contractors Representative	4.3	Add at the end of 1st paragraph: "The Contractor's Representative shall be a full-time employee or official of the Contractor (in case of Joint Venture, of the Lead Member) for at least one year. In case of Joint Venture, majority of the Key Personnel shall be from the Lead member." Add at the end of 6th paragraph: "However such temporary appointment shall not exceed 42 days."
Co-operation	4.6	Insert the following paragraph at the end of the Special Provisions: Insert the following paragraph at the end of the Special Provisions: Add new text to this Sub-clause 4.6 at the end as follows: "There may be other contractors working on the similar and/or adjacent road. The Contractor shall at all times allow the free passage of all traffic, including vehicles and equipment of other Contractors. The maintenance for the road or way shall be the responsibility of the Contractor."
Period for notification of errors in the items of reference	4.7.2 (a)	28 Days
Protection of Environment	4.18	At the end of second paragraph of Special Provision add: "and Good International Industrial Practice (GIIP) such as World Bank Group's Environmental Health and Safety Guidelines (EHSD)".
Period of payment for temporary utilities	4.19	Not Applicable. The Employer shall not provide utilities for the Contractor's use.
Number of additional paper copies of progress reports	4.20	5 (five) *Insert* "compliance" in between "and social" and "metrics" under the Special Provision. Insert the following paragraph after "The following is added at the end of the Sub-Clause:" under Special Provisions: "The Contractor shall keep a Site Diary wherein full details of all work carried out each day shall be recorded. The Site Diary may be prepared in sections

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Conditions	Sub-Clause	Data
		relating to different parts of the works being carried out in different locations. The Contractor shall submit daily 'Daily Site Report' of the preceding day to the Engineer in an approved format and should be annexed to the monthly progress report. The Daily Site Report shall also include the details of the following: i. Atmospheric condition, ii. Rainfall data, iii. Description and location of work performed, iv. Interruption of work due to any circumstances, v. Working hours, vi. Number and category of workers worked on the site, vii. Type of Equipment and Number of hours' equipment usage, viii.Test carried out including results if available, ix. Inspections carried out by the Engineer and/or Persons assigned by the Engineer, x. Supplied materials, xi. Notices and site instructions, xii.Any non-compliances with environmental, health and safety requirements; xiii. Any grievances received; and xiv. Accidents.
Archaeological and Geological Findings	4.23	After first paragraph, add (a) follow "Chance Find Procedure" and renumber the next points as (b), (c), and (d) under the special provision.
Code of Conduct	4.25	Add "and subcontractor's" after "Contractor's" in paragraphs 1 and 2 under Special Provision.
Quarries and Dumps	Sub-Clause 4.26	Add Sub-Clause 4.26 under Special Provisions as under: The contractor shall develop site specific plan for operating quarry and spoil disposal area and shall get it approved from the Engineer prior to operation. The Contractor shall obtain approval from the Engineer of all material sources before extraction. All sources of materials used under the Contract shall require such approval regardless of whether the material is obtained directly by the Contractor or supplied indirectly by others. Any quarry operated as part of this Contract shall be maintained and at the end of the Contract left in a stable condition without steep slopes and be either refilled or drained and be landscaped by appropriate

Conditions	Sub-Clause	Data
		planting. Rock or gravel won from a river shall be removed over some distance so as to limit the depth of material removed at any one location and not to disrupt the river flow or damage or undermine river banks. The Contractor shall not deposit excavated material on land in Government or private ownership except where approved by the Engineer in writing or by leave in writing of the authority responsible for such land in Government ownership or of the owner or responsible representative of the owner of such land in private ownership and only then in those places and under such conditions as the authority, owner or responsible representative may prescribe. No side deposition shall be approved regardless of ownership and where side tipping has been carried out inadvertently or otherwise the Contractor shall stabilize and replant such disturbed areas. This clause shall be read in conjunction with Sub-Clause 4.18 and with the Specifications. Nothing in this Clause shall serve in any way to reduce the responsibility of the Contractor to comply in full with all the requirements of the Specifications.
Compensation for Land Occupied or Used by Contractor	4.27	Add Sub-Clause 4.27 under Special Provisions: No land and other property shall be occupied or used by the Contractor without the full consent and agreement of affected persons or as otherwise agreed by the Engineer. In line with the resettlement Action Plan (RAP) prepared for the Kamala Dhalkebar Pathlaiya Road the Contractor shall fully compensate the occupier or owner of any land and other property used or occupied by the Contractor with such compensation in accordance with the WB Guidelines for relocation, resettlement or compensation and to the satisfaction of the affected person(s) or as agreed by the Engineer. The Contractor shall reinstate all properties whether public or private which are damaged in consequence of the execution and maintenance of the Works to a condition specified and at least equal to that obtaining before his first entry on them. If, in the opinion of the Engineer, the Contractor shall have failed to take reasonable and prompt action to fulfill his obligations in the matter of reinstatement, the Engineer will inform the Contractor in writing of his opinion in which circumstances the Employer reserves the right to employ others to do the necessary work of reinstatement and to deduct the cost thereof from any

Conditions	Sub-Clause	Data
		money due or which shall become due from the Employer to the Contractor.
Maximum allowable accumulated value of work subcontracted (as a percentage of the Accepted Contract Amount)	5.1(a)	25%
Subcontractors	5.1	Sub-Clause 5.1- Special Provisions: Insert ", the SEA/SH Prevention and Response Obligations" in between "ES requirements" and "and the obligations" in the first paragraph. Add the following paragraph at the end of the sub-clause- Special Provisions: In the event of approved subcontracting the Contractor shall ensure that the Subcontractor does not further sub-let his Subcontract. The Contractor shall be responsible for keeping a log showing following information of all Subcontractors engaged in the Works: • Name and address of the Subcontractors • Date of Subcontract • Works included in the Subcontract • Commencement of Subcontract • Completion of Subcontract • Value of Subcontract Payment The Contractor shall include such records in the progress report as per Sub-clause 4.20."
Rates of Wages and Conditions of Labour	6.2	Sub-Clause 6.2- Special Provisions: Add the following paragraph at the end: The Contractor's scales of wages shall be such as to ensure that there is no differentiation between wages for men and women for work of equal value.
Normal working hours	6.5	Normal working hours shall be 8 hours a day.

Conditions	Sub-Clause	Data
Facilities for Staff ad Labour	6.6	Sub-Clause 6.6- Special Provisions: Add the following paragraphs at the beginning: Save insofar as the Contract otherwise provides, the Contractor shall provide and maintain such accommodation and amenities as he may consider necessary for all his staff and labour, employed for the purposes of or in connection with the Contract, including all fencing, water supply (both for drinking and other purposes), electricity supply, sanitation, cookhouses, fire prevention and firefighting equipment and other requirements in connection with such accommodation or amenities, including safe hygiene facilities in line with COVID-19 guidelines and other communicable diseases. On completion of the Contract, unless otherwise agreed with the Employer, all the temporary camps/housing provided by the Contractor shall be removed and the site(s) reinstated to its (their) original condition, all to the approval of the Engineer. All accommodation facilities of whatsoever nature provided by the Contractor, whether for his own use or for the use of the Employer or Engineer shall be provided with adequate sewage and wastewater collection and treatment facilities to a design and of a capacity approved by the Engineer. Under no circumstances shall untreated sewage or wastewater be discharged to the natural environment. The Contractor shall provide appropriate facilities for children and women (separate WASH facilities) at construction campsites.

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Conditions	Sub-Clause	Data
Health and Safety of Personnel	6.7	Sub-Clause 6.7- Special Provisions: Add the following paragraphs at the end: The following paragraphs are added at the end of Sub-Clause: "All accidents shall be reported to the local authorities and police in accordance with the requirements of local laws and regulations. Additionally, the Contractor shall report to the Engineer details of any accident as soon as possible after its occurrence. In the case of any fatality or serious accident, the Contractor shall, in addition to the normal report, notify the Engineer immediately by the quickest available means. The Contractor will provide adequate protective clothing and safety equipment as required for each group of workers, following the C-ESMP, ESMP, LMP and relevant regulations. Safety training will also be given to skilled and unskilled labourers in all aspects of work." The Contractor shall barricade construction sites to prevent uncontrolled and unauthorized access by humans, livestock, wildlife and other entities. Tool-box talk will be organized.
Workers' Organisations	6.24	Add "Organizations" after "Workers" under Special Provision.
Number of additional paper copies of program	8.3	2 (Two)
Delay damages payable for each day of delay	8.8	**Phase 1: Upgrading Work** **0.05%** of the Accepted Contract Amount, less provisional sum for DAAB. **Phase 2: Performance Based Maintenance Works** Provisions of Special Specifications apply for PBM for deductions on monthly payments for failing to fulfil the maintenance standards defined in the specifications.
Maximum amount of delay damages	8.8	10% of the Accepted Contract Amount less provisional sum for DAAB. (For Phase 1: Upgrading Work)

Conditions	Sub-Clause	Data
Taking Over Parts	10.2	Add the following sentence at the end of the Sub-Clause 10.2 In the operation of this Sub-clause the passage over or through the Works by the public or the agents or servants of the Employer or by public traffic or by vehicles of the Employer, whether connected with the Contract or not, shall not constitute use or occupation by the Employer. In the second paragraph immediately after "DNP" add "of the Phase 1: Upgrading Works". In sub-paragraph (a), after "Taking-Over Certificate" insert "for Phase 1: Upgrading Works". In the first paragraph immediately after "taking over" add "for Phase 1: Upgrading Works".
Performance Certificate	11.9	Delete the second paragraph and replace with the following: "Separate Performance Certificate shall be issued for Phase 1: Upgrading Works and Phase 2: Performance Based Maintenance Works. The Engineer shall issue Performance Certificate for Phase 1 (with a copy to the Employer and DAAB) within 28 days after the latest of the expiry dates of the Defect Notification Periods, or as soon thereafter as the Contractor has supplied all the Contractor's Documents and completed and tested all the Works (including remedying any defects) in accordance with the Contract. The Engineer shall issue Performance Certificate for Phase 2: Performance Based Maintenance Works after completing all the works specified in Special Provisions to the Standard Specifications for Performance Based Maintenance. A copy of the Performance Certificates shall be issued to the Employer."
Method of measurement	12.2	In accordance with the Specifications and Bill of Quantities.
Percentage profit	12.3	As stated under 1.1.20 above

Conditions	Sub-Clause	Data
Valuation of the Works	12.3	Replace Clause 12.3 (b) (i) and (ii) with the followings" (i) the measured quantity of the item is changed by more than 25% from the quantity of this item in the Bill of Quantities or other schedule. (ii) this change in quantity multiplied by the rate or price specified in the Bill of Quantities or other specified in the Bill of Quantities or other Schedule for this item exceeds 0.5% of the Accepted Contract Amount. Delete Sub-Clause 12.3(b) (iii)

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Value Engineering- Incentive for Early Completion	13.2.1	Add this Sub- Clause after Sub-Clause13.2. This Sub-Clause shall apply only if the Contractor completes the whole of the Works within the Time for Completion under Sub-Clause 8.2 [Time for Completion], and without any extension under Sub-Clause 8.5 [Extension of Time for Completion]. In case of any extension of Time for Completion of the whole of the Works under Sub-Clause 8.5, Sub-Clause 13.2.1 shall not apply, and the Contractor shall not be entitled for any incentive payment under this Sub-Clause or for any additional payment in lieu of the incentive, under any Clause of these Conditions or otherwise in connection with the Contract. Subject to the preceding paragraph, and for achieving an early completion of the whole of the Works (Phase 1) in accordance with the Contract, the Contractor will be paid 0.02% of the Accepted Contract Amount (excluding Provisional Sum and VAT) per each day completed earlier, within a maximum limit of 5 % of the Accepted Contract Amount (excluding Provisional Sum and VAT). Early completion period shall be counted, with reference to the Commencement Date, backward from the Time for Completion for the whole of the Works under Sub-Clause 8.2 [Time for Completion] (Phase 1) and without any extension under Sub-Clause 8.5 [Extension of Time for Completion], provided that on the date on which the Works are completed in accordance with the Contract, as stated in the Taking-Over Certificate issued to the Contractor under Sub-Clause 10.1(a), no minor outstanding work or defects remain in the Works. In case any minor outstanding work or defects remain in the Works on the date on which the Works are completed in accordance with the Contract, as stated in the Taking-Over Certificate issued to the Contractor under Sub-Clause 10.1(a), the early completion of the whole of the Works will be deemed to have been achieved only on the date the Contractor completes all the minor outstanding works and remedies all the defective works. Payment for achieving early completion shall follow the same currencies and proportion as in the Schedule of Payment Currencies.

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Conditions	Sub-Clause	Data
		Any incentive payment for achieving early completion shall be made only after the Engineer issues- (a) the Taking-Over Certificate for whole of the Works under Sub-Clause 10.1, stating the date on which the Works were completed in accordance with the Contract; (b) the certificate indicating the date on which the Contractor has completed all minor outstanding works and remedied defects noted in issuing the Taking-Over Certificate under Sub-Clause 10.1(a); and (c) the certificate for achieving an early completion of the whole of the Works in accordance with this Sub-Clause, stating the achieved early completion period and its corresponding early completion incentive amount to be paid to the Contractor in accordance with this Sub-Clause. To apply for an incentive payment for achieving early completion for which the Contractor considers himself entitled under this Sub-Clause, he must include all the support documents (a) to (c) indicated above, in a monthly Statement under Sub-Clause 14.3.
Percentage rate to be applied to Provisional Sums for overhead charges and profit	13.4 (b)(ii)	5 % Add the following paragraphs at the end of (b) (ii) of Sub-clause 13.4: "For the emergency works during Phase 2, the budget is allocated in the provisional sums for the payment of the works. The payment for emergency works shall be made at existing Bill of Quantities (BoQ) rates or at appropriate Day works rates for each corresponding BoQ pay items with the Adjustments for Changes in Cost in accordance with Sub-clause 13.8. Such payments shall not be subject to additional overhead because of the fact that the BoQ and Day works rates quoted by the Contractor are with his overhead".

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Conditions	Sub-Clause	Data
Total advance payment	14.2	The Advance Payments shall be fifteen (15) percent of the initial contract price excluding provisional sums and VAT and shall be made in two installments. Ten percent (first installment) shall be paid to the contractor upon submission of unconditional Bank Guarantee for Advance payment. The rest five percent (second installment) shall be paid after the completion of mobilization of all required resources to the site as agreed in the Contract Document, after fulfilling contractual obligations including establishment of camp site, quality control laboratory, submission of work programme comprising schedules for the works, labor, equipment, material, cash flow, insurance policies, upon submission of unconditional Bank Guarantee for Advance payment issued from a commercial bank. The Advance Payment Guarantee that is issued by a foreign bank shall be counter guaranteed by a commercial bank established in Nepal. The advance payment guarantee shall be valid until the intended completion date of the Phase 1: Upgrading/Construction Phase.
Repayment of Advance payment	14.2.3	(a) deduction shall commence in the IPC in which the total of all certified interim payments (excluding the advance payment and deductions and releases of retention money) exceeds twenty percent (20%) of the portion of the Accepted Contract Amount payable in that currency less Provisional Sums and VAT. (b) deductions shall be made at the amortization rate of Twenty-Five percent (25%) provided that the advance payment shall be completely repaid prior to the time when 80 percent (80%) of the Accepted Contract Amount less Provisional Sums and VAT has been certified for payment.
Period of payment	14.3	after the end of each month
Number of additional paper copies of Statements	14.3(b)	1 (one)
Percentage of retention	14.3(iii)	**Phase 1: Upgrading Works:** **Five percent (**5%) of Interim Payment Certificate **Phase 2: Performance Based Maintenance Works:** Not Applicable
Limit of Retention Money (as a percentage of Accepted Contract Amount)	14.3(iii)	**Phase 1: Upgrading Works** **Five percent (**5%) of the Accepted Contract Amount **Phase 2: Performance Based Maintenance Works** Not Applicable
Plant and Materials	14.5(b)(i)	Not Applicable
	14.5(c)(i)	Not Applicable

Conditions	Sub-Clause	Data
Minimum Amount of Interim Payment Certificates	14.6.2	**Phase 1: Upgrading Work** 1 % of the Accepted Contract Amount. **Phase 2: Performance Based Maintenance Works** Not Applicable
Period of payment of Advance Payment to the Contractor	14.7(a)	28 days
Period for the Employer to make interim payments to the Contractor under Sub-Clause 14.6 (interim Payment)	14.7b(i)	56 days
Period for the Employer to make interim payments to the Contractor under Sub-Clause 14.13 (Final Payment)	14.7b(ii)	28 days
Period for the Employer to make final payment to the Contractor	14.7(c)	56 days
Financing charges for delayed payment (percentage points above the average bank short-term lending rate as referred to under sub-paragraph (a))	14.8	2 %
Release of Retention Money	14.9	Sub-Clause 14.9- Special Provision: Add "Phase 1: Upgrading" before "Works" in the following paragraphs.
Number of additional paper copies of draft Final Statement	14.11.1(b)	2 (Two)
Payment Reduction	14.16	Add additional Clause 14.16 "Payment Reduction" as below: Reduction of monthly payments for performance-based maintenance works shall be applied in case of non- compliance with Service Levels by means of Payment Reduction Points (PRP), as indicated in the Section 2900 of Part 2: Employers Requirements. The value of each Payment Reduction Point (PRP) is NRs. 700.00 during the first full six (6) months of Phase 2 and NRs. 1,200.00 thereafter. The Payment Reduction Points are subject to price adjustment in a manner as described in Clause 13.7 for Phase 2 works.

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Conditions	Sub-Clause	Data
	17.1	Sub-Clause 17.1- Special Provision: Add at the end the following paragraphs: "The Contractor shall carefully protect all work and materials that may be affected by weather from injury thereby. The Contractor shall provide storage to the satisfaction of the Engineer for materials to be incorporated in the Works or to be delivered to the Employer. Such storage shall be of a kind that will prevent loss of or damage to the materials. The Contractor shall take particular care to ensure the security of stores containing materials the loss of which would be likely to cause significant delay to the completion of the Works or part thereof."
Forces of nature, the risks of which are allocated to the Contractor	17.2(d)	Not Applicable
Permitted deductible limits	19.1	Insurance required for the Works: . 5% of Claim Amount subject to minimum of NRs. 0.5 Million. Insurance required for Goods: Not Applicable Insurance required for liability for breach of Professional duty: Not Applicable Insurance required against liability for fitness for purpose (if any is required): Not Applicable Insurance required for injury to persons and damage to property: NPR 10,000.00 (Ten thousand) Insurance required for injury to employees: 10,000.00 (Ten thousand) other insurances required by Laws and by local practice: -
Additional amount to be insured (as a percentage of the replacement value)	19.2.1(b)	*15%*
List of Exceptional Risks which shall not be excluded from the insurance cover for the Works	19.2.1(iv)	Earthquake
Extent of insurance required for Goods	19.2.2	N/A
Amount of insurance required for Goods		

Conditions	Sub-Clause	Data
Amount of insurance required for liability for breach of professional duty	19.2.3(a)	N/A
Insurance required against liability for fitness for purpose	19.2.3(b)	N/A
Period of insurance required for liability for breach of professional duty	19.2.3	N/A
Amount of insurance required for injury to persons and damage to property	19.2.4	The minimum amount of third party insurance shall be NRs 5 (Five) million per occurrence for the damages to the property, with no limit on the number of occurrences. The minimum amount of third party insurance for personal injury or death shall be NRs 2 (Two) million per person, with no limit on the number of occurrences
Other insurances required by Laws and by local practice (give details)		N/A
Time for appointment of DAAB member (s)	21.1	Within 42 days from the date the Contract is signed by both Parties
The DAAB shall be comprised of	21.1	Three members
List of proposed members of DAAB	21.1	Proposed by Employer : Shall be finalized within 42 days after the date of contract agreement Proposed by Contractor [*Attach CVs to the Contract*] _____
Appointment (if not agreed) to be made by	21.2	*"Executive Committee of FIDIC (International Federation of Consulting Engineers)*
Rules of arbitration	21.6(a)	Sub-Clause 21.6(a) of PART B – Special Provisions *shall* apply.
	21.6 (b)	Sub-Clause 21.6(b) of PART B – Specific Provisions ***shall*** apply.
Place of arbitration	21.6(a)	To be Indicated at the time of award of contract

Table: Summary of Sections (if any): None

Description of parts of the Works that shall be designated a Section for the purposes of the Contract (Sub-Clause 1.1.73)	Value: Percentage* of Accepted Contract Amount (Sub-Clause 14.9)	Time for Completion (Sub-Clause 1.1.84)	Delay Damages (Sub-Clause 8.8)

*****These percentages shall also be applied to each half of the Retention Money under Sub-Clause 14.9

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Part B – Special 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 1.1.77 **Statement**	On the second line after "Payment Certificate under…", add "Sub-Clause 14.2.1 [Advance Payment Guarantee],".
Sub-Clause 1.1.81 **Tender**	"the Contractor's Proposal" is deleted.
Sub-Clause 1.1.89 to 1.1.94 are added after Sub-Clause 1.1.88	
Sub-Clause 1.1 89 Bank	"**Bank**" means the financing institution (if any) named in the Contract Data.
Sub-Clause 1.1.90 **Borrower**	"**Borrower**" means the person (if any) named as the borrower in the Contract Data.
Sub-Clause 1.1.91 **ES**	"**ES**" means Environmental and Social (including Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH)).
Sub-Clause 1.1.92 **Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH)**	"**Sexual Exploitation and Abuse" "(SEA)"** means 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. **Sexual Abuse** is defined as the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions; and **"Sexual Harassment" "(SH)"** is defined as unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature by the Contractor's Personnel with other Contractor's or Employer's Personnel.
Sub-Clause 1.2 **Interpretation**	Sub-paragraph (a) is replaced with the following: (a) "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"." 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:

	(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."
Sub-Clause 1.5 **Priority of Documents**	The following documents are added in the list of Priority Documents after (e): "(f) the Particular Conditions **Part C**- Fraud and Corruption; (g) the Particular Conditions **Part D**- Environmental and Social (ES) Metrics for Progress Reports; (h) the Particular Conditions- **Part E**- Sexual Exploitation and Abuse (SEA) and/or Sexual Harassment Performance Declaration for Subcontractors;" and the list renumbered accordingly.
Sub-Clause 1.6 **Contract Agreement**	The last paragraph is replaced with: "If the Contractor comprises a JV, the authorized representative of the JV shall sign the Contract Agreement in accordance with sub –clauses 1.14 (Joint and Several Liability)."
Sub-Clause 1.12 **Confidentiality**	The following is added at the end of the second paragraph: "The Contractor shall be permitted to disclose information required to establish its qualifications to compete for other projects." "or" at the end of (b) is deleted. "or" at the end of (c) is added. The following is then added as (d): "is being provided to the Bank ."
Sub-Clause 1.17 **Inspections & Audit by the Bank**	The following Sub-Clause is added after Sub-Clause 1.16: "Pursuant to paragraph 2.2 e. of Particular Conditions - Part C- Fraud and Corruption, the Contractor shall permit and shall cause its agents (where declared or not), subcontractors, subconsultants, service providers, suppliers, and 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, selection and/or contract execution, and to have such accounts, records and other documents audited by auditors appointed by the Bank. The Contractor's and its Subcontractors' and subconsultants' attention is drawn to Sub-Clause 15.8 (Fraud and Corruption) which provides, inter alia, that acts intended to materially impede the exercise of the Bank's inspection and audit rights constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility pursuant to the Bank's prevailing sanctions procedures)."
Sub-Clause 2.4 **Employer's Financial Arrangements**	The first paragraph is replaced with: "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." The following sub-paragraph is added at the end of Sub-Clause 2.4: "In addition, if the Bank has notified to the Borrower 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

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	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 Borrower 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 a date 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.”
Sub-Clause 2.6 Employer-Supplied Materials and Employer’s Equipment	“The Employer shall supply to the Contractor the Employer-Supplied Materials listed in the Specification 704, at the time(s) stated in the Specification (if not stated, within the times that shall be required to enable the Contractor to proceed with execution of the Works in accordance with the Programme). When made available by the Employer, the Contractor shall visually inspect the Employer-Supplied Materials and shall promptly give a Notice to the Engineer of any shortage, defect or default in them. After this visual inspection, the Employer-Supplied Materials shall come under the care, custody and control of the Contractor. The Contractor’s obligations of inspection, care, custody, and control shall not relieve the Employer of liability of any shortage, defect or default not apparent from a visual inspection.”
Sub-Clause 3.1 The Engineer	The following is added at the end of the first sub-paragraph: “The Engineer’s staff shall include suitably qualified engineers and other professionals who are competent to carry out these duties.”
Sub-Clause 3.2 **Engineer’s Duties and Authority**	The Engineer shall obtain the consent in writing of the Employer before taking action under the following Sub-Clauses of these Conditions: (a) Sub-Clause 13.1: Right to vary - instructing a variation, except in an emergency situation as determined by the Engineer 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. 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.
Sub-Clause 3.3	The following is added at the end of Sub-Clause 3.3:

Engineer's Representative	"The Engineer shall obtain the consent of the Employer before appointing or replacing an Engineer's Representative."
Sub-Clause 3.4 **Delegation by the Engineer**	The following is added at the end of the second paragraph: "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."
Sub-Clause 3.6 **Replacement of the Engineer**	In the first paragraph, "42 days" is replaced with: "21 days"; In the third para, "shall" is replaced with: "should".
Sub-Clause 4.1 **Contractor's General Obligations**	The following is inserted after the paragraph **"The Contractor shall provide the Plant (and spare parts, if any) …":** "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." The following is inserted after the paragraph **"The Contractor shall, whenever required by the Engineer...":** "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 a Notice of No-objection to the Contractor, a Notice that shall not be unreasonably delayed, to the measures the Contractor proposes to manage the 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 Bid 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 ES risks and impacts of ongoing Works (e.g. excavation, earth works, 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). 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 shall be submitted to the Engineer for Review. The C-ESMP shall be part of the Contractor's Documents. The procedures for Review of the C-ESMP and its updates shall be as described in Sub-Clause 4.4.1 *[Preparation and Review]."* The following is added as (g); (g) and (h) of the Sub-Clause are then renumbered as (h) and (i) respectively.

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	(g) "if so stated in the Specification, the Contractor shall: (i) design structural elements of the Works taking into account climate change considerations; (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; (iii) consider the incremental risks of the public's potential exposure to operational accidents or natural hazards, including extreme weather events; and (iv) any other requirement stated in the Specification." The following is added at the end of the Sub-Clause: "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: (i) are affected or likely to be affected by the Contract; and (ii) may have an interest in the Contract. The Contractor shall also directly participate in Stakeholder engagements, as the Employer and/or Engineer may reasonably request."
Sub-Clause 4.2 **Performance Security and ES Performance Security**	The first paragraph is replaced with: "The Contractor shall obtain (at its cost) a Performance Security for proper performance and, if applicable, an Environmental and Social (ES) Performance Security for compliance with the Contractor's ES obligations, in the amounts stated in the Contract Data and denominated in the currency(ies) of the Contract or in a freely convertible currency acceptable to the Employer. If amounts are not stated in the Contract Data, this Sub-Clause shall not apply." In the following Sub-Clauses of the General Conditions, the term "Performance Security" is replaced with: "Performance Security and, if applicable, an Environmental and Social (ES) Performance Security": 2.1- Right of Access to the Site; 14.2- Advance Payment; 14.6- Issue of IPC; 14.12- Discharge; 14.13- Issue of FPC; 14.14 Cessation of Employer's Liability; 15.2- Termination for Contractor's Default; 15.5- Termination for Employer's Convenience.
Sub-Clause 4.2.1 **Contractor's obligations**	The first paragraph is replaced with:

	"The Contractor shall deliver the Performance Securities and, if applicable, an ES 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 issued by a reputable bank or financial institution selected by the Contractor and shall be in the form annexed to the Particular Conditions, as stipulated by the Employer in the Contract Data, or in another form approved by the Employer. The ES Performance Security shall be issued by a reputable bank selected by the Contractor and shall be in the form annexed to the Particular Conditions, as stipulated by the Employer in the Contract Data, or in another form approved by the Employer." Thereafter, throughout Sub-Clause 4.2 "Performance Security" is replaced with: "Performance Security and, if applicable, ES Performance Security."
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**	Replace sub-paragraph (a) with following: "performance security of 7.5% and ES Performance Security of 1.5% of the Accepted Contract Amount shall be returned within 28 days after the issue of the performance Certificate of Phase 1 and the contractor has complied with Sub-Clause 11.11 [Clearance of Site]; "performance security of 1% of the Accepted Contract Amount shall be returned within 28 days after the issue of the performance Certificate of Phase 2 and the contractor has complied with all obligations of the Contract including Sub-Clause 11.11 [Clearance of Site]; or"
Sub-Clause 4.3 Contractor's Representative	Add the following at the end of first paragraph: "The Contractor's Representative shall be a full-time employee or official of the Contractor (in the case of joint venture, of the Lead Member) for at least one year. In the case of joint venture, majority of the Key Personnel shall be from the Lead member. " Add the following at the end of sixth paragraph: "However, such temporary appointment shall not exceed 42 days. " 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 4.6 **Co-operation**	On the second-last line of the first paragraph before "Contractor's", "of the" is added. The following is added after the first paragraph:

	"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."
Sub-Clause 4.7 **Setting out**	In the second bullet-point of sub-paragraph (b) of Sub-Clause 4.7.3: before "if the items of reference", the following is add: "when examining the items of reference within the period stated in sub-paragraph (a) of Sub-Clause 4.7.2,". On the second and third lines, the following is deleted "and the contractor's Notice is given after the period stated in sub-paragraph (a) of Sub-Clause 4.7.2".
Sub-Clause 4.8 **Health and Safety Obligations**	The following are included after deleting "and" at the end of (f) and replacing "." with ";" at the end of (g): " (h) provide health and safety training of Contractor's Personnel as appropriate and maintain training records; (i) 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, and provision of personal protective equipment without expense to the Contractor's Personnel; (j) 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; (k) 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; (l) subject to Sub-Clause 4.6, collaborate with the entities and Personnel under paragraph (a) , (b) and (c) of Sub-Clause 4.6, in applying the health and safety requirements. This is without prejudice to the responsibility of the relevant entities for the health and safety of their own personnel; and (m) establish and implement a system for regular (not less than six-monthly) review of health and safety performance and the working environment." (n) Put in place preventive as well as response management measures following the Standard Operation Procedure (SOP) and Protocol issued by the competent authority and the Good International Industry Practice (GIIP) against the

	spread of COVID-19 and other communicable diseases among workers on site. The second and third paragraphs are replaced with the following: "Subject to Sub-Clause 4.1, 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]*. 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, (a) which shall include at a minimum: (i) 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; (ii) details of the training to be provided, records to be kept; (iii) 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); (iv) the measures to be taken to avoid or minimize the potential for community exposure to water-borne, water-based, water-related, and vector-borne diseases, (v) 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) including COVID-19 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 labour, Including COVID-19; (vi) 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 (b) any other requirements stated in the Specification. The paragraph starting with: "In addition to the reporting requirement of…" is deleted and replaced with the addition to GC Sub-Clause 4.20 in Sub-Clause 4.20 of the Special Provisions.
Sub-Clause 4.15 **Access Route**	The following is added at the end of Sub-Clause 4.15: "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, Contractor's Equipment on public roads or other public infrastructure. The Contractor shall monitor road safety incidents and accidents to identify negative safety issues, and establish and implement necessary measures to resolve them."
Sub-Clause 4.18 **Protection of the Environment**	Sub-Clause 4.18 Protection of the Environment is replaced with: "The Contractor shall take all necessary measures to: (b) protect the environment (both on and off the Site); and (c) limit damage and nuisance to people and property resulting from pollution, noise and other results of the Contractor's operations and/ or activities. 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. 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."
Sub-Clause 4.20 **Progress Reports**	Replace "4.20 (g) with: "the Environmental and Social (ES) metrics set out in Particular Conditions - Part D" The following is added at the end of the Sub-Clause:

	" "In addition to the reporting requirement of this sub-paragraph (g) of Sub-Clause 4.20 [*Progress Reports*] the Contractor shall inform the Engineer immediately 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 any allegation of SEA and/or SH. In case of SEA and/or SH, while maintaining confidentiality as appropriate, the type of allegation (sexual exploitation, sexual abuse or sexual harassment), gender and age of the person who experienced the alleged incident should be included in the information. 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. 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 Subclause."
Sub-Clause 4.21 **Security of the Site**	Sub-Clause 4.21 Security of the Site is replaced with: "**Sub-Clause 4.21 Security of the Site** The Contractor shall be responsible for the security of the Site, and: (a) for keeping unauthorised persons off the Site; (b) authorised persons shall be limited to the Contractor's Personnel, the Employer's Personnel, and to any other personnel identified as authorised personnel (including the Employer's other contractors on the Site), by a Notice from the Employer or the Engineer to the Contractor. Subject to Sub-Clause 4.1, the Contractor shall submit for the Engineer's No-objection a security management plan that sets out the security arrangements for the Site. 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

	towards 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. The Contractor shall not permit any use of force by security personnel in providing security except when used for preventive and defensive purposes in proportion to the nature and extent of the threat. In making security arrangements, the Contractor shall also comply with any additional requirements stated in the Specification."
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**	The first paragraph is replaced with the following: "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: (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."
The following Sub-Clauses 4.24, 4.25, 4.26, 4.27 are added after sub-clause 4.23	
Sub-Clause 4.24 **Suppliers (other than Subcontractors)**	**4.24.1 Forced Labour** The Contractor shall take measures to require its suppliers (other than Subcontractors) not to employ or engage forced labour including trafficked persons as described in Sub-Clause 6.21. If forced labour/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. **4.24.2 Child labour** The Contractor shall take measures to require its suppliers (other than Subcontractors) not to employ or engage child labour as described in Sub-Clause 6.22. If child labour 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.

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	4.24.3 Serious Safety Issues 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 (other than Subcontractors) to adopt procedures and mitigation measures adequate 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. **4.24.4 Obtaining natural resource materials in relation to supplier** 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 river beds or beaches. 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.
Sub-Clause 4.25 **Code of Conduct**	The Contractor shall have a Code of Conduct for the Contractor's Personnel. The Contractor shall take all necessary measures to ensure that each Contractor's Personnel is made aware of the Code of Conduct including specific behaviors including SEA/SH that are prohibited, and understands the consequences of engaging in such prohibited behaviors. These measures include providing instructions and documentation that can be understood by the Contractor's Personnel and seeking to obtain that person's signature acknowledging receipt of such instructions and/or documentation, as appropriate. 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.

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	The Contractor's Management Strategy and Implementation Plans shall include appropriate processes for the Contractor to verify compliance with these obligations.
Sub-Clause 4.26 **Quarries and Dumps**	The contractor shall develop site specific plan for operating quarry and spoil disposal area and shall get it approved from the Engineer prior to operation. The Contractor shall obtain approval from the Engineer of all material sources before extraction. All sources of materials used under the Contract shall require such approval regardless of whether the material is obtained directly by the Contractor or supplied indirectly by others. Any quarry operated as part of this Contract shall be maintained and at the end of the Contract left in a stable condition without steep slopes and be either refilled or drained and be landscaped by appropriate planting. Rock or gravel won from a river shall be removed over some distance so as to limit the depth of material removed at any one location and not to disrupt the river flow or damage or undermine river banks. The Contractor shall not deposit excavated material on land in Government or private ownership except where approved by the Engineer in writing or by leave in writing of the authority responsible for such land in Government ownership or of the owner or responsible representative of the owner of such land in private ownership and only then in those places and under such conditions as the authority, owner or responsible representative may prescribe. No side deposition shall be approved regardless of ownership and where side tipping has been carried out inadvertently or otherwise the Contractor shall stabilize and replant such disturbed areas. This clause shall be read in conjunction with Sub-Clause 4.18 and with the Specifications. Nothing in this Clause shall serve in any way to reduce the responsibility of the Contractor to comply in full with all the requirements of the Specifications.
Sub-Clause 4.27 Compensation for Land Occupied or Used by Contractor	No land shall be occupied or used by the Contractor without the full consent and agreement of affected persons or as otherwise agreed by the Engineer. In line with the resettlement Action Plan (RAP) prepared for the Kamala Dhalkebar Pathlaiya Road the Contractor shall fully compensate the occupier or owner of any land used or occupied by the Contractor with such compensation in accordance with the WB Guidelines for relocation, resettlement or compensation and to the satisfaction of the affected person(s) or as agreed by the Engineer. The Contractor shall reinstate all properties whether public or private which are damaged in consequence of the execution and maintenance of the Works to a condition specified and at least equal to that obtaining before his first entry on them. If, in the opinion of the Engineer, the Contractor shall have failed to take reasonable and prompt action to fulfill his obligations in the matter of reinstatement, the Engineer will inform the Contractor in writing of his opinion in which circumstances the Employer reserves the right to employ others to do the necessary work of reinstatement and to deduct the cost

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	thereof from any money due or which shall become due from the Employer to the Contractor.
Sub-Clause 5.1 **Subcontractors**	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 ES requirements, the SEA/SH Prevention and Response Obligations and the obligations set out in Sub-Clause 4.25 above." The following is added after the first sentence of the fourth paragraph: "The Contractor's submission to the Engineer shall also include the Subcontractor's declaration in accordance with the Particular Conditions- Part E- Sexual Exploitation and Abuse (SEA) and/or Sexual Harassment Performance Declaration for Subcontractors." 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 sub-paragraph (a) of Sub-Clause 15.2.3 [*After Termination*]. Where practicable, the Contractor shall give fair and reasonable opportunity for contractors from the Country to be appointed as Subcontractors. In the event of approved subcontracting the Contractor shall ensure that the Subcontractor does not further sub-let his Subcontract. The Contractor shall be responsible for keeping a log showing following information of all Subcontractors engaged in the Works: • Name and address of the Subcontractors • Date of Subcontract • Works included in the Subcontract • Commencement of Subcontract • Completion of Subcontract • Value of Subcontract Payment The Contractor shall include such records in the progress report as per Sub-clause 4.20."
Sub-Clause 5.2.2 **Objection to Nomination**	In sub-paragraph (a), on the first line before "Subcontractor", "nominated" is added. In sub-paragraph (c): "and" is deleted from the end of (i); "." at the end of (ii) is replaced with: ", and". The following is then added as (iii):

	"(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*]."
Sub-Clause 6.1 **Engagement of Staff and Labour**	The following paragraphs are added at the end of the Sub-Clause: "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 labour 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. The Contractor's Personnel shall be informed when any material changes to their terms or conditions of employment occur. The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labour with appropriate qualifications and experience from sources within the Country."
Sub-Clause 6.2 **Rates of Wages and Conditions of Labour**	The following paragraphs are added at the end of the Sub-Clause: "The Contractor shall inform the Contractor's Personnel about: (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. The Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such Laws. 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. The Contractor's scales of wages shall be such as to ensure that there is no differentiation between wages for men and women for work of equal value."
Sub-Clause 6.5 Working Hours	The following is inserted at the end of the Sub-Clause:

	"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."
Sub-Clause 6.6 **Facilities for Staff and Labour**	The following is added as the last paragraph: "Save insofar as the Contract otherwise provides, the Contractor shall provide and maintain such accommodation and amenities as he may consider necessary for all his staff and labour, employed for the purposes of or in connection with the Contract, including all fencing, water supply (both for drinking and other purposes), electricity supply, sanitation, cookhouses, fire prevention and firefighting equipment and other requirements in connection with such accommodation or amenities, including safe hygiene facilities in line with COVID-19 guidelines and other communicable diseases. On completion of the Contract, unless otherwise agreed with the Employer, all the temporary camps/housing provided by the Contractor shall be removed and the site(s) reinstated to its (their) original condition, all to the approval of the Engineer. All accommodation facilities of whatsoever nature provided by the Contractor, whether for his own use or for the use of the Employer or Engineer shall be provided with adequate sewage and wastewater collection and treatment facilities to a design and of a capacity approved by the Engineer. Under no circumstances shall untreated sewage or wastewater be discharged to the natural environment. The Contractor shall provide appropriate facilities for children and women (separate WASH facilities) at construction campsites. 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."
Sub-Clause 6.7 **Health and Safety of Personnel**	In the second paragraph, "The Contractor" is replaced with: "Except as otherwise stated in the Specification, the Contractor…" The following paragraphs are added at the end of Sub-Clause: "All accidents shall be reported to the local authorities and police in accordance with the requirements of local laws and regulations. Additionally, the Contractor shall report to the Engineer details of any accident as soon as possible after its occurrence. In the case of any fatality or serious accident, the Contractor shall, in addition to the normal report, notify the Engineer immediately by the quickest available means.

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	The Contractor will provide adequate protective clothing and safety equipment as required for each group of workers, following the C-ESMP, ESMP and relevant regulations. Safety training will also be given to skilled and unskilled laborers in all aspects of work."
Sub-Clause 6.9 **Contractor's Personnel**	The Sub-Clause is replaced with: "The Contractor's Personnel (including Key Personnel, if any) shall be appropriately qualified, skilled, experienced and competent in their respective trades or occupations. 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: (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 Fraud and Corruption 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]; (g) undertakes behavior which breaches the Code of Conduct including SEA/SH code for Contractor's Personnel (ES). 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. 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 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."
The following Sub-Clauses 6.13 to 6.27 are added after sub-clause 6.12	

Sub-Clause 6.13 **Foreign Personnel**	The Contractor may bring in to 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 use of appropriate insecticide.
Sub-Clause 6.17 **Alcoholic Liquor or Drugs**	The Contractor shall not, otherwise than in accordance with the Laws of the Country, import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs, or permit or allow importation, sale, gift, barter or disposal thereto by Contractor's Personnel.
Sub-Clause 6.18 **Arms and Ammunition**	The Contractor shall not give, barter, or otherwise dispose of, to any person, any arms or ammunition of any kind, or allow 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.

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Sub-Clause 6.21 **Forced Labour**	The Contractor, including its Subcontractors, shall not employ or engage forced labour. Forced labour consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty, and includes any kind of involuntary or compulsory labour, such as indentured labour, bonded labour or similar labour-contracting arrangements. No persons shall be employed or engaged who have been subject to trafficking. Trafficking in persons is defined as the recruitment, transportation, transfer, harbouring 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.
Sub-Clause 6.22 **Child Labour**	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). 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. 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. 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: (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	The Contractor shall keep complete and accurate records of the employment of labour at the Site. The records shall include the names, ages, genders, hours worked, and wages paid to all workers. These

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Employment Records of Workers	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 [Records of Contractor's Personnel and Equipment].
Sub-Clause 6.24 **Workers' Organisations**	In countries where the relevant labour laws recognise workers' rights to form and to join workers' organisations 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 labour laws substantially restrict workers' organisations, the Contractor shall enable alternative means for the Contractor's Personnel to express their grievances and protect their rights regarding working conditions and terms of employment. 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 organisations and collective bargaining or alternative mechanisms. Workers' organisations are expected to fairly represent the workers in the workforce.
Sub-Clause 6.25 **Non-Discrimination and Equal Opportunity**	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 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. 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. 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, migrant workers and children (of working age in accordance with Sub-Clause 6.22).
Sub-Clause 6.26 **Contractor's Personnel Grievance Mechanism**	The Contractor shall have a grievance mechanism for Contractor's Personnel, and where relevant the workers' organizations stated in Sub-Clause 6.24, 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.

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	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. 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. The grievance mechanism may utilize existing grievance mechanisms, providing that they are properly designed and implemented, address concerns promptly, and are readily accessible to such Contractor's Personnel. Existing grievance mechanisms may be supplemented as needed with Contract-specific arrangements.
Sub-Clause 6.27 **Training of Contractor's Personnel**	The Contractor shall provide appropriate training to relevant Contractor's Personnel on ES aspects of the Contract, including appropriate sensitization on prohibition of SEA and SH, and health and safety training referred to in Sub-Clause 4.8 As stated in the Specification or as instructed by the Engineer, the Contractor shall also allow appropriate opportunities for the relevant Contractor's Personnel to be trained on ES aspects of the Contract by the Employer's Personnel. The Contractor shall provide training on SEA and SH, including its prevention, to any of its personnel who has a role to supervise other Contractor's Personnel.
Sub-Clause 7.3 Inspection	The following is added in the first paragraph after "Employer's Personnel" "(including the Bank staff or consultants acting on the Bank's behalf, stakeholders and third parties, such as independent experts, local communities, or non-governmental organizations)" The following is added as (b) (iv): "(iv) carryout environmental and social audit, and" In sub-paragraph (b) delete "and construction" and replace with ", construction and performance based maintenance".
Sub-Clause 7.7 **Ownership of Plant and Materials**	The following is added before the first paragraph: "Except as otherwise provided in the Contract,"
Sub-Clause 8.1 **Commencement of Work**	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. The Notice shall be issued promptly after the Engineer determines the fulfilment of the following conditions:

	(a) signature of the Contract Agreement by both Parties, and if required, approval of the Contract by relevant authorities of the Country; (b) delivery to the Contractor of reasonable evidence of the Employer's financial arrangements (under Sub-Clause 2.4 [Employer's Financial Arrangements]); (c) 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; (d) 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; (e) constitution of the DAAB in accordance with Sub-Clause 21.1 and Sub-Clause 21.2 as applicable. Subject to Sub-Clause 4.1 on the Management Strategies and Implementation Plans and the C-ESMP 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."
Sub-Clause 11.7 **Right of Access after Taking Over**	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 28 days after issue of the Performance Certificate, the Contractor intends to access any part of the Works:"
Sub-Clause 13.3.1 **Variation by Instruction**	Subparagraph 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 ES information to enable an evaluation of ES risks and impacts;"
Sub-Clause 13.4 **Provisional Sums**	The following is inserted as the penultimate paragraph: "The Provisional Sum shall be used to cover the Employer's share of the DAAB members' fees and expenses, in accordance with Clause 21. No prior instruction of the Engineer shall be required with respect to the work of the DAAB. The Contractor shall submit the DAAB members' invoices and satisfactory evidence of having paid 100% of such invoices as part of the substantiation of those Statements submitted under Sub-Clause 14.3."

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Sub-Clause 13.6 **Adjustments for Changes in Laws**	The following paragraph is added at the end of the Sub-Clause: "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]."
Sub-Clause 14.1 **The Contract Price**	The following is added at the end of the Sub-Clause: "Notwithstanding the provisions of subparagraph (b), Contractor's Equipment, including essential spare parts therefore, 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 for Completion plus six months, in an amount equal to the full import duties and taxes which 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 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 part 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 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."
Sub-Clause 14.2.1 **Advance Payment Guarantee**	The first paragraph is replaced with: "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**	"and/or" from subparagraph (b) is deleted. The following is then added as subparagraph (c) and sub-paragraph (c) of the Sub-Clause is renumbered as (d): "(c) if the Contractor was, or is, failing to perform any ES 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: (i) failure to comply with any ES 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 ES issues, or anticipated risks or impacts; (i) failure to implement the C-ESMP e.g. failure to provide required training or sensitization; (ii) failing to have appropriate consents/permits prior to undertaking Works or related activities; (iii) failure to submit ES report/s (as described in Particular Conditions - Part D), or failure to submit such reports in a timely manner; (iv) failure to implement remediation as instructed by the Engineer within the specified timeframe (e.g. remediation addressing non-compliance/s); and/or"
Sub-Clause 14.7 **Payment**	At the end of sub-paragraph (b): "and" is replaced with "or" and the following inserted as (iii): "(iii) at a time when the Bank's loan or credit (from which part of the payments to the Contractor is being made) is suspended, the amount shown on any statement submitted by the Contractor

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	within 14 days after such statement is submitted, any discrepancy being rectified in the next payment to the Contractor; and" At the end of sub-paragraph (c): "." is replaced with ";" and the following inserted: "or, at a time when the Bank's loan or credit (from which part of the payments to the Contractor is being made) is suspended the undisputed amount shown in the Final Statement within 56 days after the date of notification of the suspension in accordance with Sub-Clause 16.2 [Termination by Contractor]."
Sub-Clause 14.9 **Release of Retention Money**	The following is added at the end of Sub-Clause 14.9: "Unless otherwise stated in the Contract, when the Taking-Over Certificate has been issued for the Phase 1: Upgrading 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 and, if applicable, an ES Performance Security in Sub-Clause 4.2. On receipt by the Employer of the required guarantee, the Engineer shall certify and the Employer shall 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 of Phase 1: Upgrading Works. If the Performance Security and, if applicable, an ES Performance Security required under Sub-Clause 4.2 is in the form of a demand guarantee, and the amount guaranteed under them 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 and, if applicable, an ES 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 and, if applicable, an ES Performance Security."

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Sub-Clause 14.12 Discharge	On the seventh line of the first paragraph, "Sub-Clause 21.6 [*Arbitration]*" is replaced with: "Clause 21 *[Disputes and Arbitration]'.*
Sub-Clause 14.15 Currencies of Payment	Throughout Sub-Clause 14.15, "Contract Data" is replaced with: "Schedule of Payment Currencies".
Sub-Clause 15.1 **Notice to Correct**	"and" is deleted from (b) and "." is replaced by: "; and" in (c). The following is then added as (d) "(d) specify the time within which the Contractor shall respond to the Notice to Correct." In the third para., "shall immediately respond" is replaced with: "shall respond within the time specified in (d)". Further, in the third para., "to comply with the time specified in the Notice to Correct." is replaced with: "to comply with the time specified in (c)."
Sub-Clause 15.2.1 **Notice**	Sub-paragraph (h) is replaced with: "based on reasonable evidence, has engaged in Fraud and Corruption as defined in paragraph 2.2 of the Particular Conditions - Part C- Fraud and Corruption, in competing for or in executing the Contract."
Sub-Clause 15.8 **Fraud and Corruption**	The following new Sub-Clause is added: "15.8.1 The Bank requires compliance with the Bank's Anti-Corruption Guidelines and its prevailing sanctions policies and procedures as set forth in the Bank's Sanctions Framework, as set forth in Particular Conditions - Part C- Fraud and Corruption. 15.8.2 The Employer requires the Contractor to disclose any commissions or fees that may have been paid or are to be paid to agents or any other party with respect to the bidding 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."
Sub-Clause 16.1 **Suspension by Contractor**	The following paragraph is inserted after the first paragraph: "Notwithstanding the above, if the Bank has suspended disbursements under the loan or credit 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 7 days after the Borrower having received the suspension notification from the Bank."
Sub-Clause 16.2.1 **Notice**	Sub-paragraph (j) is deleted in its entirety. At the end of sub-paragraph (i): "; or" is replaced with: "."

	sub-paragraph (f) is replaced with: "(f) the Contractor does not receive a Notice of the Commencement Date under Sub-Clause 8.1 [*Commencement of Works*] within 180 days after receiving the Letter of Acceptance, for reasons not attributable to the Contractor
Sub-Clause 16.2.2 **Termination**	The following is added at the end of Sub-Clause 16.2.2: "In the event the Bank suspends the loan or credit 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 upon expiration of the 14 days referred to in Sub-Clause 14.7 [Payment] for payments under Interim Payment Certificates, 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, namely (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 the giving of the notice."
Sub-Clause 16.3 **Contractor's Obligations After Termination**	"and" is deleted from the end of sub-paragraph (b), sub-paragraph (c) deleted and the following added: "(c) 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* (d) remove all other Goods from the Site, except as necessary for safety, and leave the Site."
Sub-Clause 17.1 **Responsibility for Care of the Works**	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". After the two instances of "Goods" in the last paragraph, the following is added: "Employer- Supplied Materials". After the two instances of "Goods" in the last paragraph, the following is added: ", Employer's Equipment,".
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/Facilities**	The following Sub-Clause is added as 17.7: "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) If any loss or damage happens to any of the above items while the Contractor is responsible for their care arising from any cause

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	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."
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**	The following paragraphs are added after the first: "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. This agreement of terms shall take precedence over the provisions of this Clause."
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 be entitled to place all insurances relating to the Contract (including, but not limited to the insurance referred to Clause 19) with insurers from any eligible source country."
Sub-Clause 19.2.1 **The Works**	On the last line of the second paragraph, "Clause 12 *[Tests after completion]*" is deleted.
Sub-Clause 19.2.5 **Injury to employees**	The second paragraph is replaced with: "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."
Sub-Clause 20.1 **Claims**	In a): "any additional payment" is replaced with "payment".
Sub-Clause 20.2 **Claims for Payment and/or EOT**	The first paragraph is replaced with: "If either Party considers that it is entitled to claim under 20.1 (a) or (b), the following claim procedure shall apply:"
Sub-Clause 21.1	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

Constitution of the DAAB	forth in Sub-Clause 3.3 of Appendix- General Conditions of Dispute Avoidance/ Adjudication Agreement." After the second paragraph insert the following paragraph: "If the Contract is with a foreign Contractor, the DAAB members shall not have the same nationality as the Employer or the Contractor."
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 42 days from the date the Contract is signed by both Parties"
Sub-Clause 21.6 **Arbitration**	In the first paragraph, delete starting from: "international arbitration" up to the end of (c), and replace with the following: "arbitration. Arbitration shall be conducted as follows: (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]. If the Contract is with domestic contractors, arbitration with proceedings conducted in accordance with the laws of the Employer's country."

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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 sub-paragraph (c), "DAA Agreement" is replaced with "DAAB Agreement". - In sub-paragraph (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):" authorised representative of the contractor or of the Employer" is replaced with: "Contractor's Representative or authorised representative of the Employer".
2. General provisions	Sub-Clause 2.2 is deleted in its entirety.
3. 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 ten 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 on FIDIC/Dispute Resolution or related relevant training . 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)."

7. Confidentiality	In Sub-Clause 7.3: "or" is deleted after sub-paragraph (b), and the following added: "or (d) is being provided to the Bank."
9. 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.
10. 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".	

Dr. Bijaya Jaishi
Project Director

Particular Conditions

Part C- Fraud and Corruption

(Text in this Particular Conditions - Part C shall not be modified)

1. **Purpose**

1.1 The Bank's Anti-Corruption Guidelines and this annex apply with respect to procurement under Bank Investment Project Financing operations.

2. **Requirements**

2.1 The Bank requires that Borrowers (including beneficiaries of Bank financing); bidders, consultants, contractors and suppliers; any sub-contractors, sub-consultants, service providers or suppliers; any agents (whether declared or not); and any of their personnel, observe the highest standard of ethics during the procurement process, selection and contract execution of Bank-financed contracts, and refrain from Fraud and Corruption.

2.2 To this end, the Bank:

a. **Defines, for the purposes of this provision, the terms set forth below as follows:**

i. "corrupt practice" is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;

ii. "fraudulent practice" is any act or omission, including misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain financial or other benefit or to avoid an obligation;

iii. "collusive practice" is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;

iv. "coercive practice" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

v. "obstructive practice" is:

(a) deliberately destroying, falsifying, altering, or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive, or collusive practice; and/or threatening, harass or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or

(b) acts intended to materially impede the exercise of the Bank's inspection and audit rights provided for under paragraph 2.2 e. below.

b. Rejects a proposal for award if the Bank determines that the firm or individual recommended for award, any of its personnel, or its agents, or its sub-consultants, sub-contractors, service providers, suppliers and/ or their employees, has, directly or

indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question;

c. In addition to the legal remedies set out in the relevant Legal Agreement, may take other appropriate actions, including declaring misprocurement, if the Bank determines at any time that representatives of the Borrower or of a recipient of any part of the proceeds of the loan engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices during the procurement process, selection and/or execution of the contract in question, without the Borrower having taken timely and appropriate action satisfactory to the Bank to address such practices when they occur, including by failing to inform the Bank in a timely manner at the time they knew of the practices;

d. Pursuant to the Bank's Anti- Corruption Guidelines and in accordance with the Bank's prevailing sanctions policies and procedures, may sanction a firm or individual, either indefinitely or for a stated period of time, including by publicly declaring such firm or individual ineligible (i) to be awarded or otherwise benefit from a Bank-financed contract, financially or in any other manner[1]; (ii) to be a nominated [2] sub-contractor, consultant, manufacturer or supplier, or service provider of an otherwise eligible firm being awarded a Bank-financed contract; and (iii) to receive the proceeds of any loan made by the Bank or otherwise to participate further in the preparation or implementation of any Bank-financed project;

e. Requires that a clause be included in bidding/request for proposals documents and in contracts financed by a Bank loan, requiring (i) bidders, consultants, contractors, and suppliers, and their sub-contractors, sub-consultants, service providers, suppliers, agents personnel, permit the Bank to inspect [3] all accounts, records and other documents relating to the submission of bids and contract performance, and to have them audited by auditors appointed by the Bank.

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[1] For the avoidance of doubt, a sanctioned party's ineligibility to be awarded a contract shall include, without limitation, (i) applying for pre-qualification, expressing interest in a consultancy, and bidding, either directly or as a nominated sub-contractor, nominated consultant, nominated manufacturer or supplier, or nominated service provider, in respect of such contract, and (ii) entering into an addendum or amendment introducing a material modification to any existing contract.

[2] A nominated sub-contractor, nominated consultant, nominated manufacturer or supplier, or nominated service provider (different names are used depending on the particular bidding document) is one which has been: (i) included by the bidder in its pre-qualification application or bid because it brings specific and critical experience and know-how that allow the bidder to meet the qualification requirements for the particular bid; or (ii) appointed by the Borrower.

[3] Inspections in this context usually are investigative (i.e., forensic) in nature. They involve fact-finding activities undertaken by the Bank or persons appointed by the Bank to address specific matters related to investigations/audits, such as evaluating the veracity of an allegation of possible Fraud and Corruption, through the appropriate mechanisms. Such activity includes but is not limited to: accessing and examining a firm's or individual's financial records and information, and making copies thereof as relevant; accessing and examining any other documents, data and information (whether in hard copy or electronic format) deemed relevant for the investigation/audit, and making copies thereof as relevant; interviewing staff and other relevant individuals; performing physical inspections and site visits; and obtaining third party verification of information.

Part D- Environmental and Social (ES)

Metrics for regular reporting:

a. *environmental incidents or non-compliances with contract requirements, including contamination, pollution or damage to ground or water supplies;*
b. *health and safety incidents, accidents, injuries that require treatment and all fatalities;*
c. *interactions with regulators: identify agency, dates, subjects, outcomes (report the negative if none);*
d. *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 & 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).
e. *health and safety supervision:*
   (i) safety officer: number days worked, number of full inspections & partial inspections, reports to construction/project management;
   (ii) number of workers, work hours, metric of PPE use (percentage of workers with full personal protection equipment (PPE), partial, etc.), worker violations observed (by type of violation, PPE or otherwise), warnings given, repeat warnings given, follow-up actions taken (if any);
f. *worker accommodations:*
   (i) number of expats 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.
g. *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);*
h. *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);*
i. *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 (including STDs) sensitization and/or training, no. 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 and SH prevention sensitization and/or training events, including number of workers receiving training on Code of Conduct for Contractor's Personnel (in the reporting period and in the past), etc.

j. 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, forest crossings, 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

(iii) 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.

k. *Grievances: list new grievances (e.g. number of allegations of SEA and SH) received in the reporting period and number of unresolved past grievances by date received, complainant's age and sex, 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

l. Traffic, road safety and vehicles/equipment:

(i) traffic and road safety incidents and accidents involving project vehicles & equipment: provide date, location, damage, cause, follow-up;

(ii) traffic and road safety incidents and 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.).

m. Environmental mitigations and issues (what has been done):

(i) dust: number of working bowsers, number of waterings/day, number of complaints, warnings given by environmentalist, actions taken to resolve; highlights of quarry dust control (covers, sprays, operational status); % of rock/ spoil lorries with covers, actions taken for uncovered vehicles;

(ii) 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;

(iii) 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;

(iv) blasting: number of blasts (and locations), status of implementation of blasting plan (including notices, evacuations, etc.), incidents of off-site damage or complaints (cross-reference other sections as needed);

(v) spill clean-ups, if any: material spilled, location, amount, actions taken, material disposal (report all spills that result in water or soil contamination;

(vi) waste management: types and quantities generated and managed, including amount taken offsite (and by whom) or reused/recycled/disposed on-site;

(vii) details of tree plantings and other mitigations required undertaken in the reporting period;

(viii) details of water and swamp protection mitigations required undertaken in the reporting period.

n. 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

(iii) compliance status of SEA and SH 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 Health and Safety Management Plan re: statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance

(v) 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 or blasting issues, etc. Cross-reference other sections as needed.

Dr. Bijaya Jaishi
Project Director

Particular Conditions

Part E- Sexual Exploitation and Abuse (SEA) and/or Sexual Harassment Performance Declaration for Subcontractors

[The following table shall be filled in by each subcontractor proposed by the Contractor, that was not named in the Contract]
Subcontractor's Name: *[insert full name]*
Date: *[insert day, month, year]*
Contract reference *[insert contract reference]*

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

SEA and/or SH Declaration
We: ☐ (a) have not been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations. ☐ (b) are subject to disqualification by the Bank for non-compliance with SEA/ SH obligations. ☐ (c) had been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations. An arbitral award on the disqualification case has been made in our favor. ☐ (d)had been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations for a period of two years. We have subsequently demonstrated that we have adequate capacity and commitment to comply with SEA /SH obligations. ☐ (e) had been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations for a period of two years. We have attached specific evidence demonstrating that we have adequate capacity and commitment to comply with SEA and SH obligations.
[*If (c) above is applicable, attach evidence of an arbitral award reversing the findings on the issues underlying the disqualification.]*
[If (d) or (e) above are applicable, provide the following information:]
Period of disqualification: From: …… To: …….
If previously provided on another Bank financed works contract, details of evidence that demonstrated adequate capacity and commitment to comply with SEA/SH obligations (**as per (d) above)** Name of Employer: ……. Name of Project:…… Contract description: …… Brief summary of evidence provided: ……. ……. Contact Information: (Tel, email, name of contact person): ……. ……

As an alternative to the evidence under (d), other evidence demonstrating adequate capacity and commitment to comply with SEA/SH obligations (**as per (e) above))** *[attach details as appropriate].* …… …… ……

Name of the Subcontractor……..

Name of the person duly authorized to sign on behalf of the Subcontractor……

Title of the person signing on behalf of the Subcontractor……

Signature of the person named above……

Date signed …… day of ……, …….

Countersignature of authorized representative of the Contractor:

Signature: ……..

Date signed …… day of ……, …….

Section X - Contract Forms

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Notification of Intention to Award

[*This Notification of Intention to Award shall be sent to each Bidder that submitted a Bid.*]

[*Send this Notification to the Bidder's Authorized Representative named in the Bidder Information Form*]

For the attention of Bidder'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 the date that this Notification is transmitted to Bidders. The Notification must be sent to all Bidders 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]*
Contract title: ……..*[insert the name of the contract]*
Country: ……..*[insert country where RFB is issued]*
Loan No. /Credit No. / Grant No.: ……..*[insert reference number for loan/credit/grant]*
RFB No: ……..*[insert RFB reference number from Procurement Plan]*

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 Bid, and/or
b) submit a Procurement-related Complaint in relation to the decision to award the contract.

1. The successful Bidder

Name:…….. [*insert name of successful Bidder*]

Address:…… [*insert address of the successful Bidder*]

Contract price:……. [*insert contract price of the successful Bid*]

2. Other Bidders *[INSTRUCTIONS: insert names of all Bidders that submitted a Bid. If the Bid's price was evaluated include the evaluated price as well as the Bid price as read out.] N/A*

Name of Bidder	Bid price	Evaluated Bid price (if applicable)
[*insert name*]	[*insert Bid price*]	[*insert evaluated price*]
[*insert name*]	[*insert Bid price*]	[*insert evaluated price*]
[*insert name*]	[*insert Bid price*]	[*insert evaluated price*]
[*insert name*]	[*insert Bid price*]	[*insert evaluated price*]
[*insert name*]	[*insert Bid price*]	[*insert evaluated price*]

3. Reason/s why your Bid was unsuccessful

[INSTRUCTIONS: State the reason/s why <u>this</u> Bidder's Bid was unsuccessful. Do NOT include: (a) a point by point comparison with another Bidder's Bid or (b) information that is marked confidential by the Bidder in its Bid.]

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 Bid. 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 Bidder, contact details; and address the request for debriefing as follows:

Attention: Dr. Bijaya Jaishi

Title/position: Project Director

Agency: Department of Roads, Development Cooperation Implementation Division, Strategic Road Connectivity and Trade Improvement Project

Email address: *dorfcb@dor.gov.np*

If your request for a debriefing is received within the 3 Business Days 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 Bidder, contact details; and address the Procurement-related Complaint as follows:

Attention: Dr. Bijaya Jaishi

Title/position: Project Director

Agency: Department of Roads, Development Cooperation Implementation Division, Strategic Road Connectivity and Trade Improvement Project

Email address: *dorfcb@dor.gov.np*

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.

Further information:

For more information see the Procurement Regulations for IPF Borrowers (Procurement Regulations)*[https://policies.worldbank.org/sites/ppf3/PPFDocuments/Forms/DispPage.aspx?docid=4005]* (Annex III). You should read these provisions before preparing and submitting your complaint. In addition, the World Bank's Guidance "How to make a Procurement-related Complaint" *[http://www.worldbank.org/en/projects-operations/products-and-services/brief/procurement-new-framework#framework]* provides a useful explanation of the process, as well as a sample letter of complaint.

In summary, there are four essential requirements:

1. You must be an 'interested party'. In this case, that means a Bidder who submitted a Bid in this bidding process, and is the recipient of a Notification of Intention to Award.
2. The complaint can only challenge the decision to award the contract.
3. You must submit the complaint within the period stated above.
4. You must include, in your complaint, all of the information required by the Procurement Regulations (as described in Annex III).

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.

On behalf of the Employer:

Signature:…….

Name:……

Title/position:…….

Telephone:……..

Email:……

Beneficial Ownership Disclosure Form

INSTRUCTIONS TO BIDDERS: DELETE THIS BOX ONCE YOU HAVE COMPLETED THE FORM

This Beneficial Ownership Disclosure Form ("Form") is to be completed by the successful Bidder. In case of joint venture, the Bidder 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 Bidder is any natural person who ultimately owns or controls the Bidder by meeting one or more of the following conditions:

- *directly or indirectly holding 25% or more of the shares*
- *directly or indirectly holding 25% or more of the voting rights*
- *directly or indirectly having the right to appoint a majority of the board of directors or equivalent governing body of the Bidder*

RFB No.: SRCTIP-DOR-W-KDP-ICB-4

Request for Bid No.: ……..[*insert identification*]

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% or more of the shares (Yes / No)	Directly or indirectly holding 25 % 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 Bidder (Yes / No)
[include full name (last, middle, first), nationality, country of residence]			

OR

(ii) *We declare that there is no Beneficial Owner meeting one or more of the following conditions:*

- directly or indirectly holding 25% or more of the shares
- directly or indirectly holding 25% or more of the voting rights
- directly or indirectly having the right to appoint a majority of the board of directors or equivalent governing body of the Bidder

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 Bidder shall provide explanation on why it is unable to identify any Beneficial Owner]

- directly or indirectly holding 25% or more of the shares
- directly or indirectly holding 25% or more of the voting rights
- directly or indirectly having the right to appoint a majority of the board of directors or equivalent governing body of the Bidder]"

Name of the Bidder: ……..*[*insert complete name of the Bidder*]

Name of the person duly authorized to sign the Bid on behalf of the Bidder: …… …… ……..**[*insert complete name of person duly authorized to sign the Bid*]

Title of the person signing the Bid: …… ……..[*insert complete title of the person signing the Bid*]

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 Bid submitted by a Joint Venture specify the name of the Joint Venture as Bidder. In the event that the Bidder is a joint venture, each reference to "Bidder" in the Beneficial Ownership Disclosure Form (including this Introduction thereto) shall be read to refer to the joint venture member.

** Person signing the Bid shall have the power of attorney given by the Bidder. The power of attorney shall be attached with the Bid Schedules.

Letter of Acceptance

[letterhead paper of the Employer]

……..[date]

To:……. *[name and address of the Contractor]*

This is to notify you that your Bid 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 Bidders, is hereby accepted by our Agency.

You are requested to furnish (i) the Performance Security and an Environmental and Social Performance Security *[**Delete ES Performance Security if it is not required under the contract**]* within 28 days in accordance with the Conditions of Contract, using for that purpose one of the Performance Security Forms and the ES Performance Security Form, ***[Delete reference to the ES Performance Security Form if it is not required under the contract]*** and (ii) the additional information on beneficial ownership in accordance with BDS ITB 47.1, within eight (8) Business days using the Beneficial Ownership Disclosure Form, included in Section X, Contract Forms, of the bidding document.

Authorized Signature: ……..

Name and Title of Signatory: …….

Name of Agency: ……..

Attachment: Contract Agreement

Contract Agreement

THIS AGREEMENT made the ……. day of ……,……., between…….. ……..of…… (hereinafter "the Employer"), of the one part, and ……of ……..(hereinafter "the Contractor"), of the other part:

WHEREAS the Employer desires that the Works known as…….. should be executed by the Contractor, and has accepted a Bid 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 Bid;

   (c) the addenda Nos ……..(if any);

   (d) the Particular Conditions;

   (e) the General Conditions;

   (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 ES Management Strategies and Implementation Plans; and

      ii. Code of Conduct for Contractor's Personnel (ES).

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…… on the day, month and year specified above.

Signed by:…… (for the Employer)

Signed by…… (for the Contractor)

Performance Security (7.5% up to the completion of Phase 1)

Option 1: Demand Guarantee

[Guarantor letterhead or SWIFT identifier code]

Beneficiary:……*[insert name and Address of* Employer*]*

Date: …… *[Insert date of issue]*

PERFORMANCE 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, 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], 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.

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[1] *The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance, 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 days after the expected completion date as described in GC 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."*

Environmental and Social (ES) Performance Security (1.5% upto the completion of Phase 1)

ES Demand Guarantee

[Guarantor letterhead or SWIFT identifier code]

Beneficiary:……*[insert name and Address of* Employer*]*
Date:…… *[Insert date of issue]*
ES PERFORMANCE 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, 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 Environmental and Social (ES) 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.

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[1] *The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance 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 days after the expected completion date as described in GC 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."*

Performance Security (1% up to the completion of Phase 1)

Option 1: Demand Guarantee

[Guarantor letterhead or SWIFT identifier code]

Beneficiary:……*[insert name and Address of* Employer*]*

Date: …… *[Insert date of issue]*

PERFORMANCE 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, 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], 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.

Advance Payment Security

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[1] *The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance, 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 days after the expected completion date as described in GC 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."*

Demand Guarantee

[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:

(a) has used the advance payment for purposes other than the costs of mobilization in respect of the Works; or

(b) 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 on the…….

[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.*

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 and, if required the ES 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.

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

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[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.*

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.

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 days after the completion date described in GC 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."*

SECTION-VI

Bill of Quantities

Notes for Unit Rate Contracts :
Objectives
The objectives of the Bill of Quantities are
(a) to provide sufficient information on the quantities of Works to be performed to enable Bids to be prepared efficiently and accurately; and
(b) when a Contract has been entered into, to provide a priced Bill of Quantities for use in the periodic valuation of Works executed.

In order to attain these objectives, Works should be itemized in the Bill of Quantities in sufficient detail to distinguish between the different classes of Works, or between Works of the same nature carried out in different locations or in other circumstances which may give rise to different considerations of cost. Consistent with these requirements, the layout and content of the Bill of Quantities should be as simple and brief as possible.
Content
The Bill of Quantities should be divided generally into the following sections:
(a) Preamble;
(b) Work Items (grouped into parts);
(c) Day works Schedule;
d) Provisional Sums; and
(d) Summary.

Preamble
The Preamble should indicate the inclusiveness of the unit prices, and should state the methods of measurement which have been adopted in the preparation of the Bill of Quantities and which are to be used for the measurement of any part of the works.

Work Items
The items in the Bill of Quantities should be grouped into sections to distinguish between those parts of the Works which by nature, location, access, timing, or any other special characteristics may give rise to different methods of construction, or phasing of the Works, or considerations of cost. General items common to all parts of the works may be grouped as a separate section in the Bill of Quantities.
Day work Schedule
A Day work Schedule should be included only if the probability of unforeseen work, outside the items included in the Bill of Quantities, is high. To facilitate checking by the Employer of the realism of rates quoted by the Bidders, the Day work Schedule should normally comprise the following:
(a) A list of the various classes of labor, materials, and Constructional Plant for which basic day work rates or prices are to be inserted by the Bidder, together with a statement of the conditions under which the Contractor will be paid for work executed on a day work basis.
(b) Nominal quantities for each item of Day work, to be priced by each Bidder at Day work rates as bid. The rate to be entered by the Bidder against each basic Day work item should include the Contractor's profit, overheads, supervision, and other charges.
Provisional Sums
A general provision for physical contingencies (quantity overruns) may be made by including a provisional sum in the Summary Bill of Quantities. Similarly, a contingency allowance for possible price increases should be provided as a provisional sum in the Summary Bill of Quantities. The inclusion of such provisional sums often facilitates budgetary approval by avoiding the need to request periodic supplementary approvals as the future need arises. Where such provisional sums or contingency allowances are used, the Contract Data should state the manner in which they will be used, and under whose authority (usually the Project Manager's).

Summary
The Summary should contain a tabulation of the separate parts of the Bill of Quantities carried forward, with provisional sums for Day work, for physical (quantity) contingencies, and for price contingencies (upward price adjustment) where applicable.

These Notes for Preparing Specifications are intended only as information for the Employer or the person drafting the Bidding documents. They should not be included in the final documents.

Bill of Quantities

1 Provisional Sum					
Procument Item Details					
SL. No	Item Description	Unit	Quantity	Unit Rate(NPR)	Amount(NPR)
1	Environmental monitoring, enhancement, mitigation works, environment awareness campaign, Training and Implementation of ESMP, as per EIA/ ESIA report, design drawings, technical specification and to the satisfaction of Engineer all complete.	PS	1.0	4008000.0	4,008,000.00
2	Compensatory Tree Plantation and take care min 5 years in the location provided by the GoN authority, as per technical specification and to the satisfaction of Engineer all complete.	PS	1.0	2.449E7	24,490,000.00
3	Social compliance and safe guards: Relocation of public Structures including livelihood restoration activities, GESI related awareness and skill enhancement as part of IPDP Implementation as per technical specification and to the satisfaction of Engineer all complete	PS	1.0	3.6598E7	36,598,000.00
4	Relocation of existing electrical works(Pole , wire and related accessories), water supply and other public utilities including Supervision and Shutdown charge as per NEA rule, design drawings, technical specification and to the satisfaction of Engineer all complete	PS	1.0	9.703E7	97,030,000.00
5	Additional testing of material or works as required by the Engineer.	PS	1.0	1000000.0	1,000,000.00
6	Emergency fund for PBM Works and Services	PS	1.0	3.0E7	30,000,000.00
7	Providing and erecting street light mounted on a steel circular hollow pole of standard specifications 10m High 1.8m overhanged armed on bothside , fitted with Sodium Vapour Lamp and fixed firmly in concrete foundation including testing & Comissioning of Electrical Works , Supervision and Shutdown charge as per NEA rule as per design,Drawing and Technical Specifications to the satisfaction of Engineer all complete	PS	1.0	1.9263E7	19,263,000.00
8	Construction of Passenger Shelter including supply of required materials as per design drawings, technical specification and to the satisfaction of Engineer all complete	PS	1.0	9631000.0	9,631,000.00
9	Cleaning and grasing of metalic bearing (24 no) as per site condition and instruction of engineer	PS	1.0	50000.0	50,000.00
10	Construction of HatBazar including supply of required materials as per design drawings, technical specification and to the satisfaction of Engineer all complete	PS	1.0	1.7917E7	17,917,000.00
11	Providing and Fixing firmly to the ground Traffic Blinker at designated locations all complete as per Drawing and Technical Specifications.	PS	1.0	749000.0	749,000.00
12	Provision for DAAB (Employer Portion)	PS	1.0	1.1E8	110,000,000.00
2 Construction work					

2.1 Road Construction Work						
2.1.1 Road Work General Item						
Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
1	Insurances for the loss of or damage to works, plant, material, equipment, property and personnel injury or death, as per technical specification and to the satisfaction of Engineer all complete. [Spec Cl no 119]	LS	1.0			
2	Contractor's material testing laboratory at site. Providing laboratory space, laboratory equipment,furniture, human resources, transportation facilities, maintaining and operating, etc. of the material testing laboratory at site, as per technical specification and to the satisfaction of Engineer all complete.The furniture and equipment of the lab shall remain the property of the Contractor upon completion of the contract.[Spec Cl no 600]	month	36.0			
3	Routine/Regular Maintenance of road during construction period, as per technical specification and to the satisfaction of Engineer all complete (Km 289+840 to Km 312+785) [Spec Cl no 2902, 109]	Km-Mon	826.0			
4	Filling Pot-holes and Patch Repairs with open-Graded Premix surfacing, 20 mm. Providing required material and repair the pot holes including removal of failed material, trimming and finishing the surface applying tack coat on the sides and base of excavation, backfilling with hot bituminous Material and compaction as per Technical Specification and instruction of the Engineer. [Spec Cl no 2903]	sqm	15057.0			
5	Provision and installation of site information notice board, as per design drawings, technical specification and to the satisfaction of Engineer all complete. (Spec Cl no 110]	Nos	2.0			
6	Provide photographs of the works as per specification.(Spec Cl no 116]	month	36.0			
7	Prepare and supply of project record (video documentary) of the site before, during and after the site works as per technical specification and to the satisfaction of Engineer. (Spec Cl no 116]	Set	3.0			

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
8	GIS Data Creation: Preparation and submission of as built drawing showing newly constructed road, drainage structures, existing utilities (electrical, telecommunication, water and sewer lines) in a format suitable for transferring to GIS database at the completion of each section, as per design drawings, technical specification and to the satisfaction of Engineer all complete. [Spec Cl no 124]	LS	1.0			

2.1.2 Site Clearance

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
1	Cutting of trees, including cutting of trunks, branches and removal of stumps, roots, stacking of serviceable Material with all lifts and lead and earth filling in the depression/pit. (Spec Cl no 200):(i) 300 mm to 600 mm	nos	726.0			
2	Cutting of trees, including cutting of trunks, branches and removal of stumps, roots, stacking of serviceable Material with all lifts and lead and earth filling in the depression/pit. (Spec Cl no 200):(ii) 600mm to 900 mm	nos	703.0			
3	Cutting of trees, including cutting of trunks, branches and removal of stumps, roots, stacking of serviceable Material with all lifts and lead and earth filling in the depression/pit. (Spec Cl no 200):(iii) 900 mm to 1800 mm	nos	343.0			
4	Cutting of trees, including cutting of trunks, branches and removal of stumps, roots, stacking of serviceable Material with all lifts and lead and earth filling in the depression/pit. (Spec Cl no 200):(iv) 1800 mm to 2500 mm	nos	61.0			
5	Cutting of trees, including cutting of trunks, branches and removal of stumps, roots, stacking of serviceable Material with all lifts and lead and earth filling in the depression/pit. (Spec Cl no 200):(v) Above 2500 mm	nos	83.0			
6	Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including scaffolding wherever necessary, sorting the dismantled Material, disposal of unserviceable Material and stacking the serviceable Material with all lifts and lead (Spec Cl no 200): (a) Prestressed /reinforced cement concrete grade above M-20	cum	2738.0			

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
7	Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including scaffolding wherever necessary, sorting the dismantled Material, disposal of unserviceable Material and stacking the serviceable Material with all lifts and lead (Spec Cl no 200):(b) Above 600 mm to 900 mm dia Hume Pipe	m	9.0			
8	Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including scaffolding wherever necessary, sorting the dismantled Material, disposal of unserviceable Material and stacking the serviceable Material with all lifts and lead (Spec Cl no 200):(c) Above 900 mm dia Hume Pipe	m	88.0			
9	Dismantling of Steel works of structure comprising of masonry, cement concrete, wood work, steel work, including scaffolding wherever necessary, sorting the dismantled Material, disposal of unserviceable Material and stacking the serviceable Material with all lifts and lead , Steel Work in all types of sections upto a height of 5 m above plinth level excluding cutting of rivet. including dismembering (Spec Cl no 202)	ton	2.0			
10	Dismantling Railing by manual means and disposal of dismantled Material with all lifts and up to a lead , stacking serviceable Material and unserviceable Material separately. (Spec Cl no 202)	m	773.0			
11	Dismantling of structure comprising of masonry including scaffolding wherever necessary, sorting the dismantled Material, disposal of unserviceable Material and stacking the serviceable Material with all lifts and lead, (Spec Cl 202)	cum	189.0			
12	Clearing and grubbing including uprooting, transporting and disposing of vegetation, grass, bush, sapling and trees of girth up to 300 mm(measured at a height of 1m above the ground level), all complete (Spec Cl no 201)	sqm	611280.0			
13	Dismantling of flexible pavements and disposal of dismantled Material , stacking serviceable and unserviceable Material separately, (Spec Cl no 202): (a) Bituminous course	cum	13671.0			
14	Dismantling of flexible pavements and disposal of dismantled Material , stacking serviceable and unserviceable Material separately, (Spec Cl no 202): (b) Granular course	cum	8795.0			

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
15	Dismantling of cement concrete pavement by mechanical means using pneumatic tools, breaking to pieces not exceeding 0.02 cum in volume and stock piling at designated locations and disposal of dismantled Material , stacking serviceable and unserviceable Material separately (Spec Cl no 202)	cum	1177.0			
16	Dismantling Kerb stone by manual means and disposal of dismantled Material with all lifts and lead(Spec Cl no 202)	cum	301.0			

2.1.3 Earthworks

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
1	Roadway and unlined surface drain excavation in all types of soil as per drawing and technical specification, including all lift and lead as per drawing and instruction of the engineer(Spec Cl no 900)	cum	22473.0			
2	Construction of embankment by Filling with approved suitable Material .Providing, laying, spreading and compacting embankment with suitable material as per drawing and Technical Specification(Spec Cl no 909,910,1205)	cum	625800.0			

2.1.4 Pavement Works

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
1	Providing and laying sub-grade and earthen shoulders with approved Material obtained from borrow pits with all lifts & leads as per Drawing and Technical Specifications.(Spec Cl no 1000,1200)	cum	303354.0			
2	Granular Sub-Base Material: Providing and laying granular sub-base on prepared surface, mixing at OMC, and compacting to achieve the desired density , complete as per Drawing and Technical Specifications. (Spec Cl no 1201)	cum	170971.0			
3	Wet Mix Macadam: Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC laying in uniform layers in base course on well prepared surface and compacting to achieve required density as per Drawing and Technical Specifications. (Spec Cl no 1208)	cum	141832.0			

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
4	Prime Coat, with MC 30 / 70 : Providing and applying prime coat with hot bitumen (including cutter) on prepared surface of granular base incuding cleaning of road surface and spraying as per Technical Specification. (Spec Cl no 1302)	lit	448136.0			
5	Tack coat with Bitumen : Providing and applying tack coat with hot bitumen at specified rate on the prepared surface including cleaning as per Technical Specification.(Spec Cl no 1302)	lit	570565.0			
6	Bituminous Concrete : Providing and laying Asphalt concrete using crushed aggregates of specified grading premixed with bituminous binder and filler as per Drawing and Technical Specifications (SS Clause 1309).	cum	26943.0			
7	Providing and laying Dense Bituminous Macadam using crushed aggregates of specified grading , premixed with bituminous binder and filler as per drawing and Technical Specifications. (Spec Cl no 1308)	cum	47135.0			
8	Dry Lean Cement Concrete Sub- base: Construction of dry lean cement concrete Sub- base over a prepared sub-grade with coarse and fine aggregate with optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days as per drawing and technical Specification(Spec Cl no 1318)	cum	606.0			
9	Cement Concrete Pavement: Construction of plain cement concrete pavement over a prepared sub base spread, compacted and finished in a continuous operation as approved, curing compound, finishing to lines and grades as per drawing and Technical Specification(Spec Cl no 1319)	cum	1213.0			
10	Construction of Median and Island with approved suitable Soil : Providing and laying Median and Island above road level with approved Material including compaction as per Drawing and Specifications. (Spec Cl no 1205)	cum	62177.0			

2.1.5 Structures (Retaining Wall Structure Side Drains Cross Drainage Structure including Protection Work

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
1	Providing and laying of PCC (Grade M 15) as per Drawing and Technical Specifications(Spec Cl no 2000)	cum	6887.0			

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
2	Earthwork in Excavation of foundation of structure in all type of soil including construction of shoring and bracing, removal of stumps and other deleterius matter and backfilling with approved material as per drawings and technical specifications including necessary dewatering(Spec Cl No 907)	cum	47183.0			
3	Providing and laying of plain/reinforced cement concrete in foundation complete as per drawing and technical specifications (including formwork). RCC M20 (Spec Cl no 2000)	cum	216.0			
4	Random Rubble Masonry: Providing and laying of Stone Masonry Work in Cement Mortar 1:3 as per Drawing and Technical Specifications.(Spec Cl no 2608)	cum	13251.0			
5	Providing and laying, weep holes in brick dry/plain/reinforced concrete abutment, wing wall/return wall with 110 mm dia HDPE pipe, extending througn the full width of the structure with slope 1V:20H towards outer face complete as per drawing and technical specificatios(Spec cl no 3109)	m	9375.0			
6	Providing and laying of Filter media with granular Material/stone crushed aggregates to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and Technical Specification.(Spec Cl no 3110)	cum	3866.0			
7	Providing and laying of plain/reinforced cement concrete in sub-structure complete as per drawing and Technical specifications (including formwork).(Grade RCC M 20) (Spec Cl no 2000)	cum	10524.0			
8	Laying and fixing of Geo-Textile Filter all complete as per Drawing and Technical Specifications.(Spec Cl no 2404)	sqm	136.0			
9	Providing and laying of plain/reinforced cement concrete in Foundation all complete as per drawing and technical specifications (including formwork) (Grade RCC M 25)(Spec Cl no 2000)	cum	45.0			
10	Providing and laying of plain/reinforced cement concrete in sub-structure complete as per drawing and Technical specifications (including formwork) (Grade RCC M 25 Upto 5m) (Spec Cl no 2000)	cum	16.0			

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
11	Providing and laying, fitting and placing un-coated HYSD reinforcement all complete as per drawing and technical specification (Spec Cl no 2014)	ton	2133.0			
12	Laying and fixing of Steel Drainer (100mm Dia) at Drainage Opening all complete as per Drawing and Technical Specifications.(Spec Cl no 3117)	nos	2324.0			
13	Providing and laying of hand pack stone soling with 150 to 200 mm thick stones and packing with smaller stone on prepared surface as per Drawing and Technical Specifications.(Spec Cl no 1402A)	cum	2800.0			
14	Providing and laying of sand to a thickness of not less than 300 mm compacted to a firm condition complete as per drawing and Technical Specification. (Spec Cl no 908A)	cum	2556.0			
15	Providing and laying of Plain/Reinforced Cement Concrete complete as per Drawing and Technical Specifications. RCC grade M35 (Including Formwork) (Spec Cl no 2000)	cum	17465.0			

2.1.6 Road Furniture and Traffic Safety Measures

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
1	Providing and fixing of retro-reflectorized warning, Regulatory and informatory sign as per specification clause 1501 made of high intensity grade sheeting, fixed over aluminum sheeting, 1.5mm thick supported on a 50 mm internal dia steel tube or steel angle iron post 75mm x 40mm x 6mm firmly fixed to the ground by means of properly designed foundation with M10/40 grade cement concrete 30 cm x 30 cm, 30 cm below ground level or as per Drawing and Technical Specifications. (Spec Cl no 1501):(i) 900 mm Equilateral Triangle	nos	195.0			
2	Providing and fixing of retro-reflectorized warning, Regulatory and informatory sign as per specification clause 1501 made of high intensity grade sheeting, fixed over aluminum sheeting, 1.5mm thick supported on a 50 mm internal dia steel tube or steel angle iron post 75mm x 40mm x 6mm firmly fixed to the ground by means of properly designed foundation with M10/40 grade cement concrete 30 cm x 30 cm, 30 cm below ground level or as per Drawing and Technical Specifications. (Spec Cl no 1501):(ii) 750 mm Circular	nos	63.0			

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
3	Providing and fixing of retro-reflectorized warning, Regulatory and informatory sign as per specification clause 1501 made of high intensity grade sheeting, fixed over aluminum sheeting, 1.5mm thick supported on a 50 mm internal dia steel tube or steel angle iron post 75mm x 40mm x 6mm firmly fixed to the ground by means of properly designed foundation with M10/40 grade cement concrete 30 cm x 30 cm, 30 cm below ground level or as per Drawing and Technical Specifications. (Spec Cl no 1501):(iii) Rectangular 500mm x 1000mm	nos	32.0			
4	Providing and fixing of retro-reflectorized warning, Regulatory and informatory sign as per specification clause 1501 made of high intensity grade sheeting, fixed over aluminum sheeting, 1.5mm thick supported on a 50 mm internal dia steel tube or steel angle iron post 75mm x 40mm x 6mm firmly fixed to the ground by means of properly designed foundation with M10/40 grade cement concrete 30 cm x 30 cm, 30 cm below ground level or as per Drawing and Technical Specifications. (Spec Cl no 1501):(iv) Rectangular 600mm x 1000mm	nos	8.0			
5	Providing and fixing of retro-reflectorized warning, Regulatory and informatory sign as per specification clause 1501 made of high intensity grade sheeting, fixed over aluminum sheeting, 1.5mm thick supported on a 50 mm internal dia steel tube or steel angle iron post 75mm x 40mm x 6mm firmly fixed to the ground by means of properly designed foundation with M10/40 grade cement concrete 30 cm x 30 cm, 30 cm below ground level or as per Drawing and Technical Specifications. (Spec Cl no 1501):(v) Rectangular 400mm x 400mm	nos	32.0			
6	Providing and fixing of retro-reflectorized warning, Regulatory and informatory sign as per specification clause 1501 made of high intensity grade sheeting, fixed over aluminum sheeting, 1.5mm thick supported on a 50 mm internal dia steel tube or steel angle iron post 75mm x 40mm x 6mm firmly fixed to the ground by means of properly designed foundation with M10/40 grade cement concrete 30 cm x 30 cm, 30 cm below ground level or as per Drawing and Technical Specifications. (Spec Cl no 1501):(vi) \Rectangular 500mm x 500mm	nos	3.0			

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
7	Providing and fixing of retro-reflectorized warning, Regulatory and informatory sign as per specification clause 1501 made of high intensity grade sheeting, fixed over aluminum sheeting, 1.5mm thick supported on a 50 mm internal dia steel tube or steel angle iron post 75mm x 40mm x 6mm firmly fixed to the ground by means of properly designed foundation with M10/40 grade cement concrete 30 cm x 30 cm, 30 cm below ground level or as per Drawing and Technical Specifications. (Spec Cl no 1501):(vii) Rectangular 450mm x 450mm	nos	28.0			
8	Providing and fixing of retro-reflectorized warning, Regulatory and informatory sign as per specification clause 1501 made of high intensity grade sheeting, fixed over aluminum sheeting, 1.5mm thick supported on a 50 mm internal dia steel tube or steel angle iron post 75mm x 40mm x 6mm firmly fixed to the ground by means of properly designed foundation with M10/40 grade cement concrete 30 cm x 30 cm, 30 cm below ground level or as per Drawing and Technical Specifications. (Spec Cl no 1501): (viii) Rectangular 900mm x 1200mm	nos	36.0			
9	Providing and fixing of retro-reflectorized warning, Regulatory and informatory sign as per specification clause 1501 made of high intensity grade sheeting, fixed over aluminum sheeting, 1.5mm thick supported on a 50 mm internal dia steel tube or steel angle iron post 75mm x 40mm x 6mm firmly fixed to the ground by means of properly designed foundation with M10/40 grade cement concrete 30 cm x 30 cm, 30 cm below ground level or as per Drawing and Technical Specifications. (Spec Cl no 1501):(ix) Rectangular 3000mm x 1700mm	nos	16.0			
10	Providing and fixing of retro-reflectorized warning, Regulatory and informatory sign as per specification clause 1501 made of high intensity grade sheeting, fixed over aluminum sheeting, 1.5mm thick supported on a 50 mm internal dia steel tube or steel angle iron post 75mm x 40mm x 6mm firmly fixed to the ground by means of properly designed foundation with M10/40 grade cement concrete 30 cm x 30 cm, 30 cm below ground level or as per Drawing and Technical Specifications. (Spec Cl no 1501):(x) Rectangular 2000mm x 1000mm	nos	30.0			

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
11	Providing and fixing of retro-reflectorized warning, Regulatory and informatory sign as per specification clause 1501 made of high intensity grade sheeting, fixed over aluminum sheeting, 1.5mm thick supported on a 50 mm internal dia steel tube or steel angle iron post 75mm x 40mm x 6mm firmly fixed to the ground by means of properly designed foundation with M10/40 grade cement concrete 30 cm x 30 cm, 30 cm below ground level or as per Drawing and Technical Specifications. (Spec Cl no 1501):(xi) Rectangular 1500mm x 1000mm	nos	6.0			
12	Providing and fixing of retro-reflectorized warning, Regulatory and informatory sign as per specification clause 1501 made of high intensity grade sheeting, fixed over aluminum sheeting, 1.5mm thick supported on a 50 mm internal dia steel tube or steel angle iron post 75mm x 40mm x 6mm firmly fixed to the ground by means of properly designed foundation with M10/40 grade cement concrete 30 cm x 30 cm, 30 cm below ground level or as per Drawing and Technical Specifications. (Spec Cl no 1501):(xii) Rectangular 2000mm x 1500mm	nos	28.0			
13	Yellow Metal Reflector on Concrete Crash Barrier as per Drawing and Technical Specifications (Spec Cl no 1512)	nos	2466.0			
14	Galvanised Metal Beam Crash Barrier Reflector as per Drawing and Technical Specifications (Spec Cl no 1513)	nos	3334.0			
15	Type - A, "W" : Metal Beam Crash Barrier: Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m center to center, 1.8 m high, 1.1 m below ground/road level metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete as per Drawing and Technical Specifications.(Spec Cl no 1511)	m	16670.0			
16	Providing and Fixing Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with M-40 grade concrete with HYSD reinforcement and dowel bars 25mm dia, 450mm long at expansion joints filled with pre-molded asphalt filler board, keyed to the structure on which it is built and installed as per design, Drawing and Technical Specifications. (Spec Cl no 1510)	m	12332.0			

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
17	Road marking with hot applied thermoplastic compound with reflectrizing glass beads on smooth pavement surface .Providing and laying of hot applied thermoplastic compound at least 2mm thick including reflectorizing glass beads as per DOR Traffic sign manual/ Specifications. The finished surface to be level, uniform and free from streaks and holes.(Spec Cl no 1504)	sqm	67282.0			
18	Providing and fixing reinforcement cement concrete M 15 grade kilometer post including painting and printing as per standard drawing -2070 and technical specification. (Spec Cl no 2014):(a) Ordinary 1 KM Stone	nos	18.0			
19	Providing and fixing reinforcement cement concrete M 15 grade kilometer post including painting and printing as per standard drawing -2070 and technical specification. (Spec Cl no 2014):(b) 5 KM Stone	nos	6.0			
20	Providing and fixing of road stud 100 x 100 mm, die-cast in aluminium, resistant to corrosive effect of salt and grit, fitted with lenses reflectors, installed in concrete or asphaltic surface by drilling hole 30 mm upto a depth of 60 mm and bedded in a suitable bituminous grout or epoxy mortar, all as per Drawing and Technical Specifications., Aluminium Studs 100 x 100 mm fitted with lense reflectors(Spec Cl no 1505)	nos	1083.0			
21	Providing and fixing Median Markers with fluorescent yellow colour retro reflective sheeting Type XI as per IRC:67(Spec Cl no 1514)	nos	9178.0			
22	Providing and Laying RCC 300mm dia NP3 Flush jointed pipe for culvert including fixing with cement mortar 1: 2 as per drawing and technical specifications (Spec Cl no 700)	m	3700.0			
23	Overhead Signs (Providing and erecting overhead signs with a corrosion resistant aluminium alloy sheet reflectorised with high intensity retro-reflective sheeting of encapsulated lense type with vertical and lateral clearance given in clause 802.2 and 802.3 and installed as per clause 802.7 over a designed support system of aluminium alloy or galvanised steel trestles and trusses of sections and type as per structural design requirements and approved plans) Truss and Vertical Support (Spec Cl no 1502):(A) Truss and Vertical Support	ton	15.0			

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
24	Overhead Signs (Providing and erecting overhead signs with a corrosion resistant aluminium alloy sheet reflectorised with high intensity retro-reflective sheeting of encapsulated lense type with vertical and lateral clearance given in clause 802.2 and 802.3 and installed as per clause 802.7 over a designed support system of aluminium alloy or galvanised steel trestles and trusses of sections and type as per structural design requirements and approved plans) Truss and Vertical Support (Spec Cl no 1502): (B) Aluminium alloy plate for over head sign	sqm	230.0			
25	Providing and Laying of M20 precast cement concrete Kerb 38cm x 20cm x 25cm (H*B*L) with 12mm thick 1:3 cement sand mortar bedding and joints including foundation excavation, levelling and foundation concrete , all complete as per Drawing and Technical Specifications.(Spec Cl no 1401)	m	83000.0			
26	Providing and painting two coats after filling the surface with synthetic enamel paint in all shades on Kerb stone as per drawing and technical specifications (Spec Cl no 1501)	sqm	31891.0			
27	Providing, fitting and fixing steel railing complete as per drawing and Technical Specification(Spec Cl no 3105)	m	12935.0			
28	Providing and laying of precast / cast in situ 50 mm thick cement concrete slab footpath on 12 mm thick 1: 3 cement sand mortar over the prepared base, all complete as per Drawing and Technical Specifications.(Spec cl no 1400)	sqm	46480.0			
29	Providing Sand Filling as per Drawing & Technical Specification(Spec Cl no 908)	cum	1394.0			
30	Providing and Laying 100mm HDPE Pipe below Foothpath @ 5m C/C distance as per Drawing & Technical Specification(Spec Cl no 3111)	m	4648.0			
31	Painting on steel surface: Providing and applying two coats of ready mix paint of approved quality on steel surface after through cleaning of surface to give an even shade as per drawing and technical specifications. (Spec Cl no 1501)	sqm	230.0			
2.1.7 Bridge-Repair and Rehabilitation						
Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
1	Removal of existing asphaltic wearing coat including disposal with all lift and lead complete as per Technical Specification and Direction of the Engineer. (Spec cl no 2712)	Sqm	530.0			
2	Providing and Filling Pot-holes and Patch Repairs with Bituminous concrete of 40 mm thick. Providing required material and repair the pot holes including removal of failed material, trimming and finishing the surface applying tack coat on the sides and base of excavation, backfilling with hot bituminous Material and compaction as per Technical Specification and instruction of the Engineer.(Spec Cl no 2903)	Sqm	530.0			
3	Removal of existing cement concrete wearing coat including its disposal without causing any detrimental effect to any part of the bridge structure and removal of dismantled material with all lifts and lead complete as per Technical Specifications (Spec Cl no 2712)	Cum	73.0			
4	Providing and replacement/Maintenance of Expansion Joints complete as per drawings, Technical specifications and direction of the Engineer.(Spec cl no 2900)	m	192.0			
5	Providing and applying polymer concrete (35 mm thick) and curing compounds on damaged concrete surface as per technical specification and approval of the Engineer. (Spec Cl no 2700)	Sqm	5.0			
6	Providing and Applying epoxy mortar over leached, honey combed and spalled concrete surface and exposed steel reinforcement complete as per Technical Specification (Spec Cl no 2707)	Sqm	88.0			
7	Providing and Sealing of cracks/porous concrete by application of epoxy resin complete as per Technical Specification (Low viscosity epoxy resin)(Spec cl no 2706)	Sqm	971.0			
8	Providing and replacement of Damaged Concrete Railing as per Drawing, Technical Specifications and direction of the Engineer,. (Spec Cl no 2700)	m	23.0			
9	Providing and replacement of Damaged steel railing as per Drawing, Technical Specifications and direction of the Engineer. (Spec Cl no 2700)	m	307.0			
10	Providing and painting steel bridge including removal of old paints by sand blasting, cleaning and repairing of metal surfaces for the application of new paints as per specification and direction of the Engineer. (Spec Cl no 2713)	Sqm	957.0			

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
11	Concrete Jacketing: Preparation, hacking and cleaning of existing surface for concrete jacketing as per direction of the Engineer.(Spec Cl no 2700)	Sqm	58.0			
12	Concrete Jacketing: Drilling Holes on existing concrete surface of 16 mm diameter and 300 mm depth. (Spec Cl no 2700)	nos.	112.0			
13	Concrete Jacketing: Providing and fixing Longitudinal bar & Confining bar (stirrups) (Spec Cl no 2700)	Kg.	954.0			
14	Concrete Jacketing: Providing and Filling drill hole with Epoxy Grout. (Spec Cl no 2700)	Lit	6.0			
15	Concrete Jacketing:Providing and applying Micro silica/ silica fume concreting for concrete jacketing works (slab /beam/ abutment section of the bridges) as per instructions of manufacturer and as approved by the Engineer. (Spec Cl no 2700)	Cum	5.0			
16	Providing and laying Gabion structure for retaining earth with diaphragm including rolling, cutting, weaving, placing laying sides and diaphragms with binding wire and filling boulders all complete as per Drawing and Technical Specification: Mesh wire-10Swg(0.0615 kg/m), Selvedge Wire 8 Swg (0.1057 kg/m), Binding Wire 12 Swg (0.0409 kg/m) Hexagonal mesh Type 100 mm x 120 mm (Spec Cl no 2401)	cum	130.0			

2.1.8 Perfomance Based Maintenance

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
1	Performance based maintenance and Regular Maintenance (length workers & Supervisors) works and services including all activities as per design drawings, technical specification and to the satisfaction of Engineer all complete. [SS/SP 2900]: (i) Year#1	km-month	275.0			
2	Performance based maintenance and Regular Maintenance (length workers & Supervisors) works and services including all activities as per design drawings, technical specification and to the satisfaction of Engineer all complete. [SS/SP 2900]: (ii) Year#2	km-month	275.0			
3	Performance based maintenance and Regular Maintenance (length workers & Supervisors) works and services including all activities as per design drawings, technical specification and to the satisfaction of Engineer all complete. [SS/SP 2900]: (iii) Year#3	km-month	275.0			

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
4	Performance based maintenance and Regular Maintenance (length workers & Supervisors) works and services including all activities as per design drawings, technical specification and to the satisfaction of Engineer all complete. [SS/SP 2900]: (iv) Year#4	km-month	275.0			
5	Performance based maintenance and Regular Maintenance (length workers & Supervisors) works and services including all activities as per design drawings, technical specification and to the satisfaction of Engineer all complete. [SS/SP 2900]: (v) Year#5	km-month	275.0			

2.1.9 Dayworks

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
1	Labour : (i) Skilled Labour	M-day	100.0			
2	Labour : (ii) Unskilled Labour	M-day	500.0			
3	Material : (i) Stone	Cum	100.0			
4	Material: (ii) Cement	Mt.	10.0			
5	Material: (iii) Reinforcement (8,10,12,16,20,25mm)	Mt.	10.0			
6	Material: (iv) Aggregate(10-40mm size)	Cum	500.0			
7	Material: (v) Sand	Cum	200.0			
8	Material: (vi) Supply of Heavy zinc coated Mechanically selvedged double twisted wire mesh 100mm x 120mm size with mesh wire 3.0mm ,selvedge wire 3.9, and lacing wire 2.4mm	Sqm	400.0			
9	Plant / Equipment :The rates shall include all cost of operating on site as fuel, lubricant, driver and associated labour wages, overhead and profit. only time actually employed open the work shall be paid.: (i)Tipper (4- 6 m3 capacity)	Hr.	100.0			
10	Plant / Equipment :The rates shall include all cost of operating on site as fuel, lubricant, driver and associated labour wages, overhead and profit. only time actually employed open the work shall be paid.:(ii)Truck (8-10 T capacity)	Hr.	100.0			

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
11	Plant / Equipment :The rates shall include all cost of operating on site as fuel, lubricant, driver and associated labour wages, overhead and profit. only time actually employed open the work shall be paid.:(iii) Loader (1-1.5 m3 capacity)	Hr.	50.0			
12	Plant / Equipment :The rates shall include all cost of operating on site as fuel, lubricant, driver and associated labour wages, overhead and profit. only time actually employed open the work shall be paid.:(iv) Excavator (greater than 0.75 Cum capacity)	Hr.	50.0			
13	Plant / Equipment :The rates shall include all cost of operating on site as fuel, lubricant, driver and associated labour wages, overhead and profit. only time actually employed open the work shall be paid.:(v) Motor Grader (greater than 135 HP capacity)	Hr.	50.0			
14	Plant / Equipment :The rates shall include all cost of operating on site as fuel, lubricant, driver and associated labour wages, overhead and profit. only time actually employed open the work shall be paid.:(vi)Vibratory Roller (greater than 10 ton Capacity)	Hr.	50.0			
15	Plant / Equipment :The rates shall include all cost of operating on site as fuel, lubricant, driver and associated labour wages, overhead and profit. only time actually employed open the work shall be paid.:(vii) Water Browser (5000 ltr capacity)	Hr.	50.0			
2.1.10 Miscellaneous Works for Nepal Telecom						
Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
1	Earthwork in Excavation of Foundation of Structure including construction of shoring and bracing removal of stumps and deleterious matter and Backfilling with approved material deposited with including compaction as per design drawing , technical specification and to the satisfaction of Engineers all Complete (Spec Cl no 2000/704)	Cum	13067.0			
2	Construction of RCC (M20 grade) joint chamber of OFC joint (inner size 1mx 1mx1m @ 1900m c/c) including Excavation and Backfilling , Compaction , Stone Soling , Cover Slab as per design drawings , technical specification and to the satisfaction of Engineers all Complete[Spec Cl No 2000/704]	Nos	47.0			

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
3	Supplying , Transporting , Placing and Fixing of 100mm dia Medium type GI pipe at Culverts , Bridge Causeway etc as per design drawings , technical specification and to the satisfaction of Engineers all Complete(Spec Cl no 2000/704)	m	1351.0			
4	Transporting from site yard, Laying, Fixing of 40/33 PL-HDPE duct pipe in line and level with necessary Fittings and laying of warning tape as per design drawings , technical specification and to the satisfaction of Engineers all Complete . [NTC shall provide 40/33 PL- HDPE Pipe and Fittings at Site](Spec Cl no 2000/704)	m	46260.0			
5	Supplying, Transporting ,Placing and fixing of 6 inch dia HDPE pipe pressure 6 kg/cm2 at road crossing in line and level with necessary Fittings as per design drawings , technical specification and to the satisfaction of Engineers all Complete . (Spec Cl no 2000/704)	m	600.0			

2.2 Bridge Construction Work including VUP/PUP

2.2.1 FOUNDATION

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
1	Earth work in excavation of foundation of structures for all types of soil including rock, including construction of shoring and bracing, removal of stumps and other deleterious matter and backfilling with approved Material as per Drawing and Technical Specifications.(Spec Cl no 907)	cum	27361.0			
2	Providing and laying of hand pack stone soling with 150 to 200 mm thick stones and packing with smaller stone on prepared surface as per Drawing and Technical Specifications. (Spec Cl no 1402A)	cum	677.0			
3	Providing and laying of Plain Cement Concrete M 15 in Foundation complete as per Drawing and Technical Specifications. (Including Formwork) (Spec Cl no 2000)	cum	995.0			
4	Providing and laying of Plain/Reinforced Cement Concrete in Foundation complete as per Drawing and Technical Specifications. RCC grade M35. (Including Formwork) (Spec Cl no 2000)	cum	27265.0			
5	Providing and laying , fitting and placing un-coated HYSD reinforcement complete in foundation complete as per drawing and technical specification (Spec Cl no 2014)	ton	2769.0			

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
6	Providing, Boring and installing bored cast-in-situ RCC Pile excluding Reinforcement and Concrete in all types of soil including Bentonite and other consumable and removal of excavated earth with necessary lifts and lead all complete as per Drawing and Technical Specifications. (Spec Cl no 1612)	m	14733.0			
7	Carryout Pile Load Test including all consumable and accessories as per test procedure mentioned in the Technical Specifications.(Spec Cl no 1614)	Nos	44.0			

2.2.2 SUBSTRUCTURE

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
1	Providing and laying of Plain/Reinforced Cement Concrete in Abutment and Piers complete as per Drawing and Technical Specifications. RCC grade M35(Including Formwork) (Spec Cl no 2000)	cum	7920.0			
2	Providing and laying , fitting and placing un-coated HYSD reinforcement complete in sub-structure complete as per drawing and technical specification (Spec Cl no 2014)	ton	1064.0			
3	Supplying and placing of 600mm thick filter material layer at rear of the abutment. (Spec Cl no 909, 910)	cum	2072.0			
4	Supply and placing 75mm Diameter HDP Pipe for Weep Holes @ 1.5m c/c both ways scattered(Spec Cl no 3109)	m	2224.0			
5	Providing, Laying and Erection of Reinforced soil structure using RCC Precast Panel made from M35 Grade Concrete as Facia of minimum 160 mm thickness and 50 mm / 70 mm wide Geosynthetic strap soil reinforcement made of polyester yarns and encapsulated LLDPE Sheathing all complete as per drawing and Technical Specifications. (Spec cl no 301)	sqm	23194.0			
6	Supply, laying and compaction of Reinforced Earth Backfill (Compacted volume) as per technical specification (Spec cl no 909,910)	cum	289933.0			

2.2.3 SUPER STRUCTURE

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
1	Providing and laying of Reinforced / Pre-stressed cement concrete in super-structure as per drawing and Technical Specification. RCC/PSC grade M50 (Including Formwork and Staging) (Spec Cl no 2000)	cum	1315.0			

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
2	Providing and laying of Reinforced / Pre-stressed cement concrete in super-structure as per drawing and Technical Specification. RCC/PSC grade M45 (Including Formwork and Staging) (Spec Cl no 2000)	cum	834.0			
3	Providing and laying of Reinforced / Pre-stressed cement concrete in super-structure as per drawing and Technical Specification. RCC/PSC grade M40 (Including Formwork and Staging) (Spec Cl no 2000,2100)	cum	331.0			
4	Providing and laying of Reinforced / Pre-stressed cement concrete in super-structure as per drawing and Technical Specification. RCC/PSC grade M30 (Including Formwork and Staging) (Spec Cl no 2000,2100)	cum	278.0			
5	Providing and laying of Reinforced cement concrete in super-structure as per drawing and Technical Specification. RCC grade M35(Including Formwork and Staging) (Spec Cl no 2000)	cum	10520.0			
6	Providing and laying of Reinforced cement concrete in super-structure as per drawing and Technical Specification. RCC grade M25(Including Formwork and Staging) (Spec Cl no 2000)	cum	586.0			
7	Providing and laying , fitting and placing un-coated HYSD reinforcement complete in super-structure complete as per drawing and technical specification (Spec Cl no 2014)	ton	2112.0			
8	High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications (Spec Cl no 2100)	ton	81.0			
9	Providing and laying of an elastomeric slab seal expansion joint complete as per Drawings and Technical specifications (Spec Cl no 1901)	m	702.0			
10	Supplying, fitting and fixing in position true to line and level POT PTFEE bearing including all accessories as per Drawing and Technical Specifications. (Spec Cl no 1902)	nos	64.0			
11	Supplying, fitting and fixing in position true to line and level elastomeric bearing including all accessories as per Drawing and Technical Specifications. (Spec Cl no 1902)	nos	236.0			
12	Providing and fixing Drainage Spouts complete as per Drawing and Technical specifications. (Spec Cl no 3107))	nos	204.0			

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
13	Bituminous Concrete : Providing and laying Asphalt concrete using crushed aggregates of specified grading premixed with bituminous binder and filler as per Drawing and Technical Specifications (SS Clause 1309).	cum	583.0			
14	Providing and Painting two coats after filling the surface with synthetic enamel paint in all shades on concrete / plaster surfaces as per Drawing and Technical Specifications. (Spec Cl no 1506)	sqm	9858.0			
15	Providing, fencing and erecting 75 mm dia painted steel pipe railing in 3 rows on precast M 20 grade RCC vertical posts 1.8 metres high (1.2 m above GL) with 3 holes 75 mm dia for pipe, fixed 2 metres center to, complete as per Drawing and Technical Specifications. (Spec Cl no 3105)	m	95.0			

2.2.4 APPROACH ROAD AND PROTECTION WORKS

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
1	Earth work in excavation of foundation of structures for all types of soil including rock, including construction of shoring and bracing, removal of stumps and other deleterious matter and backfilling with approved Material as per Drawing and Technical Specifications.(Spec Cl no 907)	cum	4490.0			
2	Providing and laying of Plain Cement Concrete M 15 in Foundation complete as per Drawing and Technical Specifications. (Including Formwork) (Spec Cl no 2000)	cum	169.0			
3	Backfilling behind Structure with Locally available material including compaction by Tampering rod (Without watering)(Spec Cl no 909,910)	cum	7900.0			
4	Providing, Laying and Assembling Gabion boxes mattresses, placing in position including stretching, forming compartments; tying with bracing wires and tie wires; tying down the lid complete; and providing and filling stone / boulder in gabion boxes / mattresses etc. including dressing, bedding, bonding and all transportation as per specification. (Machine Made Gabions including stone / boulder filling) (Spec cl no 2401)	cum	3752.0			
5	Providing and laying of a geotextile filter between pitching and embankment slopes as per Drawing and Technical Specifications. (Spec cl no 2404)	sqm	6233.0			

Procument Item Details						
SL. No	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
6	Providing and laying Stone Masonry work in cement mortar 1:4 in structure complete as per Drawing and Technical Specifications.(Spec cl no 2602, 2603, 2608)	cum	3539.0			
7	Supplying and placing of 300mm thick filter material layer at rear of the abutment.(Spec cl no 3110)	cum	803.0			
8	Supply and placing 75mm Diameter HDP Pipe for Weep Holes @ 1.5m c/c both ways scattered(Spec Cl no 3109)	m	1573.0			
9	Turfing: Grass sodding works including sod cutting , transporting , placing in position and water sprinkling (Spec cl no 2807)	sqm	420.0			
10	Providing and fixing two HDPE pipe of dia. 200 mm with MS-Rod, nuts, and bolts at the interval of 3m as per drawing and specifications for Utility (2000/704)	m	1610.0			
Total of Procument Items						
Total Item Price						
VAT						
Grand Total						