GOVERNMENT OF ASSAM.

ASSAM INTEGRATED RIVER BASIN MANAGEMENT PROJECT

REQUEST FOR BIDS NO: **WRD/WB/Beki Pkg 1**

NATIONAL OPEN COMPETITIVE PROCUREMENT

(Two-Envelope Bidding Process with e-Procurement)

(*FOR ITEM RATE/ADMEASUREMENT CONTRACTS IN CIVIL WORKS)*

NAME OF WORK	**CONSTRUCTION& UPGRADING OF RIVER WORKS ALONG THE BEKI RIVER FOR REDUCING FLOOD AND RIVER EROSION RISKS.**
PERIOD OF AVAILABILITY OF BIDDING DOCUMENT	FROM 15-02-2022 to 29-03-2022
TIME AND DATE OF PRE-BID MEETING	DATE 01-03-2022 TIME 12.30 HOURS
LAST DATE AND TIME FOR RECEIPT OF BIDS	DATE 29-03-2022 TIME 15.00 HOURS
TIME AND DATE OF OPENING OF BIDS – Technical Part	DATE 29-03-2022 TIME 15.30 HOURS
PLACE OF OPENING OF BIDS	**Office of the Chief Engineer,** **5th Floor, Assam Water Center** **Street Address: Kundil Nagar, Basistha** **City: Guwahati** **PIN/Postal Code: 781029** **Country: INDIA**
OFFICER INVITING BIDS	**Chief Engineer, Water Resources Department**

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REQUEST FOR BIDS

(RFB)

GOVERNMENT OF ASSAM
ASSAM INTEGRATED RIVER BASIN MANAGEMENT PROJECT

REQUEST FOR BIDS (RFB)
E-Procurement Notice
(Two-Envelope Bidding Process with e-Procurement)

NATIONAL OPEN COMPETITIVE PROCUREMENT

Name of Project: Integrated Water Resources Management of Buridehing Basin

Contract Title: ***Construction& upgrading of river works along the Beki River for reducing flood and river erosion risks.***

RFB Reference No.: WRD/WB/Beki Pkg 1 **Date**: 15/02/2022

1. The Government of India has applied for financing from the World Bank toward the cost of the Assam Integrated River Basin Management Project (AIRBMP) and intends to apply part of the proceeds toward eligible payments under the contract for construction of works as detailed below.

2. Bidding will be conducted through national open competitive procurement using a Request for Bids (RFB) as specified in the World Bank's "Procurement Regulations for IPF Borrowers, November 2020" ("Procurement Regulations"), and is open to all Bidders as defined in the Procurement Regulations.

3. Bidders from India should, however, be registered with the Government of India or other State Governments/ Government of India, or State/ Central Government Undertakings. Bidders from India, who are not registered as above, on the date of bidding, can also participate provided they get themselves registered by the time of contract signing, if they become successful bidders.

4. The WATER RESOURCES DEPARTMENT (WRD), ASSAM now invites online Bids from eligible Bidders for lots/contracts for the construction of works detailed below in the table. Two more Requests for Bids have also been issued by WRD for construction of Works along the rivers Buridehing and Beki.The bidders may submit bids for any or all of the lots/contracts in these three Requests for Bids. If a Bidder chooses to quote for more than one lot/contract, it should submit separate Bid (complete with all documents including Bid Security) for each lot/contract. A Bidder wishing to offer discounts in case it is awarded more than one contract, will be allowed to do so provided those discounts are included in the Letter of Bid – Financial Part.Interested bidders may obtain further information and inspect

the bidding document at the address given below during office hours. Bidders are advised to note the clauses on eligibility (Section I Clause 4) and minimum qualification criteria (Section III – Evaluation and Qualification Criteria), to qualify for the award of the contract. In addition, please refer to paragraphs 3.14 and 3.15 of the "Procurement Regulations" setting forth the World Bank's policy on conflict of interest.

5. The bidding document is available online on www.assamtenders.gov.in and also on the Project websites of FREMAA,Assam i.e. http://fremaa.assam.gov.in and website of WRD, Assam i.e. http://waterresources.assam.gov.infrom 15-02-2022 to 29-03-2022 which can be downloaded free of cost. However, bidders will be required to register themselves in the Assam tender portal before downloading the bidding document and the registration is free.The bidders would be responsible for ensuring that any addenda available on the e tender portal is also downloaded and incorporated. **No print media publication would be given for any addendum/corrigendum.**

6. For submission of the bid, the bidder is required to have Digital Signature Certificate (DSC) from one of the Certifying Authorities authorised by Government of India for issuing DSC. Aspiring bidders who have not obtained the user ID and password for participating in e-procurement in this Project, may follow the instructions mentioned in the Assam Tenders e procurement portal ww.assamtenders.gov.in.

7. Bids comprise two Parts, namely the Technical Part and the Financial Part, and both parts must be submitted simultaneously online on www.assamtenders.gov.in on or before 15:00 hours on 29-03-2022 (date) and the 'Technical Part' of the bids will be publicly opened online on the same day at 1530 hours, in the presence of the bidders'designated representatives who wish to attend. The Technical Part opening meeting will also be connected virtually through live video conference, for which the electronic connection link will be sent by the Employer through email to the bidders who may choose to attend through video conference at least five (5) calendar days before the Technical Part opening. For obtaining the electronic connection link, the participating bidders must submit a request through e-mail to the Employer at mail ID: worldbank.wrd@gmail.com.
   The "Financial Part" shall remain unopened in the e-procurement system until the second public Bid opening for the financial part.

   Any bid or modifications to bid (including discount) received outside e-procurement system will not be considered. If the Employer's office happens to be closed on the date of opening of the bids as specified, the bids will be opened on the next working day at the same time and venue. The electronic bidding system would not allow any late submission of bids.

8. All Bids must be accompanied by a Bid Security separately for each lot (contract) for the amount(s) specified in the table below. Bid security will have to be in any one of the forms as specified in the bidding document and shall have to be valid for 45 days beyond the validity of the bid. Procedure for submission of bid security is described in Para 9.

9. The bidders are required to submit (a) original bid security and (b) original affidavit, regarding correctness of information furnished with the bid, **either by registered post/speed post/courier or by hand, so as to reach** the Office of the Chief Engineer, 5th Floor, Assam Water Center, Street Address: Kundil Nagar, Basistha, City: Guwahati, PIN/Postal Code: 781029, before the bid submission deadline, failing which the bids will be declared non-responsive and will not be opened.

10. A pre-bid meeting will be held on 01-03-2022 at 12.30 hours at the office of the Chief Engineer, Water Resources Department, Assam to clarify the issues and to answer questions on any matter that may be raised at that stage as stated in ITB Clause 7.4 of 'Instructions to Bidders' of the bidding document. Bidders are advised to download the bidding document prior to the pre-bid meeting in order for bidders to have a good understanding of the scope of works under the contracts for discussion and clarification at the pre-bid meeting.

11. Other details can be seen in the bidding document. The Employer shall not be held liable for any delays due to system failure beyond its control. Even though the system will attempt to notify the bidders of any bid updates, the Employer shall not be liable for any information not received by the bidder. It is the bidders' responsibility to verify the website for the latest information related to this bid.

12. The address for communication is as under:

    Office of the Chief Engineer,
    5th Floor, Assam Water Center
    Street Address: Kundil Nagar, Basistha
    City: Guwahati
    PIN/Postal Code: 781029
    Country: INDIA

    e-mail ID: worldbank.wrd@gmail.com

TABLE

Lot/Contract no.	Brief description of Works	Completion Period	Bid Security Amount
1	River bank protection work At Elengbari, at Safakamar and Katajar and Chunbari area including upgradation of Embankment at Ch. 2780 to 6780m.(L/B), located along the left bank of Beki River with provision of construction of apron with silt filled geobags in crates	24 months	Rs. 55 Lakhs

	and bank revetment with geobags over geo filter media and toe key with PVC coated crates filled with geobags including porcupine worksas per the specifications.		
2	River bank protection work at Dumunighat and Nisuka, Salsalia, Bordonga and Guileza-Mowamari, Sawpur and Choudhury Bazar area located along the both bank of Beki River with provision of construction of apron with silt filled geobags in crates and bank revetment with geobags over geo filter media and toe key with PVC coated crates filled with geobags including porcupine works as per the specifications	24 months	Rs. 62 Lakhs

Sd-
Chief Engineer,
Water Resources Department,
Assam

Table of Contents

PART 1 – Bidding Procedures

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 thisRFB are **specified in the BDS.**
	1.2 Throughout this bidding document: (a) the term "in writing" means communicated in written form (e.g. by mail, e-mail, and fax, including if**specified in the BDS**, distributed or received through the electronic-procurement system used by the Employer) with proof of receipt; (b) if the context so requires, "singular" means "plural" and vice versa; (c) "Day" means calendar day, unless otherwise specified as "Business Day". A Business Day is any day that is a working day of the Borrower. It excludes the Borrower's official public holidays; (d) the term "**ES**" means Environmental and Social (including Sexual Exploitation, and Abuse (SEA), and Sexual Harassment (SH)); (e) "**Sexual Exploitation and Abuse" "(SEA**)" means the following: (i) "**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. (ii) "**Sexual Abuse"** is defined as the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions; (f) **"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; (g) "Contractor's Personnel" is as defined in Sub-Clause 1 (ii) of the General Conditions of Contract; and (h) **"Employer's personnel"** is as defined in GCC Sub-Clause 1 (nn) of the General Conditions of Contract. 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 thisbidding documentis 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 (whether 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 anyinitial selection process, prequalification process,

	bid submission, proposal submission,andcontract 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, or a state-owned enterprise or institution subject to ITB 4.6, or any combination of them 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, unless otherwise **specified in the BDS**. 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. This authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all members. Unless **specified in the BDS**, there is no limit on the number of members in a JV. The joint venture agreement shall be registered in the place **specified in BDS** so as to be legally valid and binding on members.
	4.2 A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to 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) 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) any of its affiliates has been hired (or is proposed to be hired) by the Employer or Borrower as Project Manager (Engineer) for the Contract implementation; (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; (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 unlessthe conflict stemming from such relationship has been resolved in a manner acceptable to the Bank throughout the procurement 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,in accordance with its prevailing sanctions policies and procedures as set forth in the WBG'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.
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, and3, which include 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 of Contract (GCC) • Section IX - Particular Conditions of Contract (PCC) • Section X - Contract Forms • Annexure ESMP
	6.2 The Specific Procurement Notice - Request for Bids (RFB) issued by the Employer is not part of thisbidding document.
	6.3 Unless directly downloaded from the official website specified in the 'E-Procurement Notice', 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 or downloaded from the official website specified in the 'E-Procurement Notice' shall prevail.
	6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the bidding documentand 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 The electronic bidding system **specified in the BDS**provides for online clarifications. A Bidder requiring any clarification on the bidding documentmay notify the Employeronline or raise its inquiries during the pre-Bid meeting if provided for in accordance with ITB 7.4. Clarifications requested through any other mode shall not be considered by the Employer.The Employer will respond to any request for clarification, providedthat such request is receivedprior to the deadline for submission of Bids within a period **specified in the BDS**. Description of clarification sought and the response of the Employer shall be uploadedfor information of all Bidders without identifying the source of request for clarification. Should the clarification result in changes to the essential elements of the bidding document, the Employer shall amend the bidding documentfollowing the procedure under ITB 8 and ITB 22.2.It is the bidder's responsibility to check on the e-procurement system, for any addendum/ amendment/ corrigendum to the bidding document.
	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 Siteof 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 only through the e-procurement portal, not later than one week before the meeting.Clarifications requested through any other mode shall not be considered by the Employer.
	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 uploaded online on e-procurement system. 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.It is the bidder's responsibility to check on the e-procurement system, for any addendum/ amendment/ corrigendum to the bidding document. 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 deemed to have been communicated to all the bidders.The addenda will appear on the e-procurement system under "Latest Corrigendum", and Email notification is also automatically sent to those bidders who have started working on the tender, unless otherwise **specified in the BDS**. The Employer shall not be liable for any information not received by the bidder. It is the bidders' responsibility to verify the website for the latest information related to this bid.
	8.3	To give prospective Bidders reasonable time in which to take an addendum into account in preparing their Bids, the Employer may, at its discretion, extend the deadline for 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 in no case 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 English. 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 English, 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 two Parts, namely the Technical Part and the Financial Part. These two Parts shall be submitted simultaneously. 11.2 The Technical Part shall contain the following: (a) **Letter of Bid– Technical Part**prepared in accordance with ITB 12 and ITB 14; (b) **Bid Security or Bid-Securing Declaration** in accordance with ITB 19.1; (c) **Alternative Bid – Technical Part**, if permissible, in accordance with ITB 13, the Technical Part of any Alternative Bid; (d) **Authorization:**written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 20.3, and in accordance with ITB 20.4 in case of a JV; (e) **Bidder's Eligibility:**documentary evidence in accordance with ITB 17 establishing the Bidder's eligibility to Bid; (f) **Qualifications**: documentary evidence in accordance with ITB 17 establishing the Bidder's qualifications to perform the contractif its Bid is accepted; (g) **Conformity**: a technical proposal in accordance with ITB 16; (h) **Construction methodology** as detailed in Para 1.1 of Section III Evaluation Criteria; (i) Contractor Registration certificate (as per RFB); and (j) any other document**required in the BDS**. 11.3 The **Financial Part** shall contain the following: (a) **Letter of Bid – Financial Part:** prepared in accordance with ITB 12 and ITB 14; (b) **Completed Schedules** including priced Bill of Quantitiesin accordance with ITB 12 and ITB 14, as **specified in BDS;** (c) **Alternative Bid - Financial Part:** if permissible in accordance with ITB 13; and

	(d) any other documentrequired **in the BDS.** 11.4 The Technical Part shall not include any information related to the Bid price. Where material financial information related to the Bid price is contained in the Technical Part the Bid shall be declared non-responsive. 11.5 In addition to the requirements under ITB 11.2, Bids submitted by a JV (where permitted) 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. 11.6 The Bidder shall furnish in the Letter of Bid – Financial Part information on commissions and gratuities, if any, paid or to be paid to agents or any other party relating to this Bid.
12. Process of Bid Submission	12.1 The Letter of Bid – Technical Part, Letter of Bid – Financial Part, Schedules includingBill of Quantities, and all documents listed under Clause 11, 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. 12.2 Entire Bid including the Letters of Bid, Schedules and filled-up Bill of Quantitiesshall be submitted online on e-procurement system specified in ITB 7.1. Details and process of online submission of the tender and relevant documents are given in the website mentioned above. Scanned copies of documents listed in ITB Clauses 11 and 12.3 should also be uploaded on this website. 12.3 **Submission of Original Documents**: The bidders are required to separately submit (i) original payment documents towards the cost of bid document; and registration on e-procurement website (if applicable); (ii) original bid securityor Bid-Securing Declaration in approved form; and (iii) original affidavit regarding correctness of information furnished with bid document, with the office **specified in the BDS**, before the Bid submission deadline, either by registered/speed post/courier or by hand, failing which the bids will be declared non-responsive and will not be opened. Hard copy of rest of the bid or any other document are not to be submitted.

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.Such parts will be identified **in the BDS** and described in Section VII,Works'Requirements. The method for their evaluation will be stipulated in Section III,Evaluation and Qualification Criteria.
14. Bid Prices and Discounts	14.1 The prices and discounts quoted by the Bidder in the Letter of Bid –Financial Part and in the Schedules including Bill of Quantities shall conform to the requirements specified below.
	14.2 The Bidder shall submit a Bid for the whole of the Works described in ITB 1.1 by filling in prices for all items of the Works, as identified in Section IV - Bidding Formsalongwith the total bid price (both in figures and words). 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 will not be paid for by the Employer when executed and shall be deemed covered by the rates for other items and prices in the Bill of Quantities.Corrections if any, in the bid can be carried out by editing the information before electronic submission on e-procurement portal.

	14.3 The price to be quoted in the Letter of Bid – Financial Part,in accordance with ITB 12.1, shall be the total price of the Bid, excluding any discounts offered.
	14.4 The Bidder shall quote anydiscounts and indicate the methodology for their application in the Letter of Bid – Financial Partin accordance with ITB 12.1.
	14.5 Unless otherwise **specified in the BDS**and the Conditions of Contract, theprices quoted by the Bidder shall be fixed. 14.6 If so specified in ITB 1.1, Bids are 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.
	14.7 All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the deadline for submission of Bids, shall be included in the rates and prices and the total Bid price submitted by the Bidder. 14.8 Bidders may like to ascertain availability of tax/duty exemption benefits available in India. They are solely responsible for obtaining such benefits which they have considered in their bid and in case of failure to receive such benefits for reasons whatsoever, the Employer will not compensate the bidder (Contractor). The bidder shall furnish alongwith his bid a declaration to this effect in the Declaration Format provided in Section IV of the bidding document. Where the bidder has quoted taking into account such benefits, it must give all information required for issue of certificates in terms of the Government of India's relevant Notifications as per the declaration format. In case the bidder has not provided the required information or has indicated to be furnished later on in the Declaration Format, the same shall be construed that the goods/construction equipment for which certificate is required is Nil. To the extent the Employer determines the quantities indicated therein are reasonable keeping in view the quantities in bill of quantities, construction program and methodology, the

	certificates will be issued within 60 days of signing of the contract and no subsequent changes will be permitted. In case of materials pertaining to Variation items and quantities, the certificate shall be issued only on request from the Contractor when in need and duly certified by the Project Manager. No certificate will be issued for items where no quantity/capacity of equipment is indicated in the statement. If the bidder has considered the tax/duty exemption for materials/construction equipment to be bought for the work, the bidder shall confirm and certify that the Employer will not be required to undertake any responsibilities of the Government of India Scheme or the said exemptions being available during the contract execution, except issuing the required certificate. The bids which do not conform to the above provisions or any condition by the bidder which makes the bid subject to availability of tax/duty exemption for materials/construction equipment or compensation on withdrawal of any variations to the said exemptions will be treated as non-responsive and rejected. Any delay in procurement of the construction equipment/machinery/goods as a result of the above shall not be a cause for granting any extension of time.
15. Currencies of Bid and Payment	15.1 The unit rates and prices shall be quoted by the Bidder and shall be paid for, entirely in Indian Rupees.
16. Documents Comprising the Technical Proposal	16.1 The Bidder shall furnish a technical proposal in the Technical Part of the Bid, 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 Bidders' 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 – Technical Part, 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.

18. Period of Validity of Bids	18.1	Bids shall remain valid for 90 days or for the Bid Validity period **specified in the BDS**. The Bid Validity period starts from the date fixed for the Bid submission deadline (as prescribed by the Employer in accordance with ITB 22.1). A Bid valid for a shorter period shall be rejected by the Employer as nonresponsive.
	18.2	In exceptional circumstances, prior to the expiration of the Bid validity period, 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 forty five (45) days beyond the deadline of the extended validity period. 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 expiry of the initial Bid validity period,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 theBDS;** (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 the Technical Part of itsBid, 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, for the amount **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 bank guarantee issued by a Nationalized or Scheduled bank located in India;

	(b) an irrevocable letter of credit issued by a Nationalized or Scheduled bank located in India; (c) a cashier's or certified checkor demand draft issued by a Nationalized or Scheduled bank located in India; (d) another security **specified in the BDS**, In the case of a bank guarantee, the Bid Security shall be submitted using the Bid Security Form included in Section IV, Bidding Forms. The form must include the complete name of the Bidder. The Bid Security shall be valid for forty-five (45) days beyond the original validity period of the Bid, or beyond any period of extension 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 responsiveBid 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 (ES) Performance Securitypursuant to ITB 50.
	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 (ES) Performance Security.
	19.7 The Bid Security may be forfeited or the Bid-Securing Declaration executed: (a) if a Bidder withdraws/modifies/substitutes its Bid during the period of Bid validity specified by the Bidder on the Letter of Bid- Technical Part and repeated in Letter of Bid - Financial Part, or any extension thereto provided by the Bidder; or (b) if the Bidder does not accept the correction of its Bid Price pursuant to ITB 36; or (c) if the successful Bidder fails to:

	(i) sign the Contract in accordance with ITB 49; or (ii) furnish a Performance Securityand if required in the BDS, the Environmental and Social (ES) Performance Security in accordance with ITB 50.
	19.8 The Bid Security or the Bid-Securing Declaration of a JVshall be in the name of the JVthat submits the Bid. If the JVhas not been constituted into a legallyenforceable 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 mentioned 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 during the period of Bid validity specified by the Bidder in the Letters of Bidor any extended date provided by the Bidder; or (b) if the successful Bidder fails to: sign the Contract in accordance with ITB 49; or furnish a Performance Security and if required in the BDS, the Environmental and Social (ES) Performance Security in accordance with ITB 50; 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 as **stated in the BDS**.
20. Format and Signing of Bid	20.1 The Bidder shall prepare the Bid as per details given in ITB 21.
	20.2 Bidders shall mark as "CONFIDENTIAL" information in their Bids which is confidential to their business.
	20.3 The Bid 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 uploaded alongwith the Bid. The name and position held by each person signing the authorization must be typed or printed below the signature.
	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. Documents

	establishing authority to sign the bid on behalf of the JV shall be uploaded alongwith the bid. 20.5 Any interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Bid.
D. Online Submission and Opening of Bids	
21. Preparation of Bids	21.1 Bids, both Technical and Financial Parts, shall be submitted online on the e-procurement system specified in BDS 7.1. Detailed guidelines for viewing bids and submission of online bids are given on the website. The Request for Bids under this Project is published on this website. Any citizen or prospective bidder can logon to this website and view the Request for Bids and can view the details of works for which bids are invited. A prospective bidder can submit its bid online; however, the bidder is required to have enrolment/registration in the website, and should have valid Digital Signature Certificate (DSC) in the form of smart card/e-tokenobtained from any certifying agencyauthorised by the Government of India (for class of DSC **specified in BDS**). The bidder should register in the website using the relevant option available. Then the Digital Signature registration has to be done with the e-token, after logging into the website. The bidder can then login the website through the secured login by entering the password of the e-token & the user id/ password chosen during registration. After getting the bid schedules, the Bidder should go through them carefully and submit the specified documents, alongwith the bid, otherwise the bid will be rejected.
	21.2 The completed bid comprising of documents indicated in ITB 12, should be uploaded on the e-procurementportal alongwith scanned copies of requisite certificates as are mentioned in different sections in the bidding document and scanned copy of the bid security.
	21.3 All the documents are required to be signed digitally by the bidder. After electronic online bid submission, the system generates a unique bid identification number which is time stamped as per server time. This shall be treated as acknowledgement of bid submission.
	21.4 Physical, e-mail, Telex, Cable or Facsimile bids will be rejected as non-responsive.

22. Deadline for Submission of Bids	22.1 Bids, both Technical and Financial Parts,must be uploaded online no later than the date and time **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 electronic bidding system would not allow any late submission of bids after due date & time as per server time.
24. Withdrawal, Substitution, and Modification of Bids	24.1 Bidders may modify their bids by using the appropriate option for bid modification on e-procurement portal, before the deadline for submission of bids. For this the bidder need not make any additional payment towards the cost of bid document. For bid modification and consequential re-submission, the bidder is not required to withdraw his bid submitted earlier. The last modified bid submitted by the bidder within the bid submission time shall be considered as the bid. For this purpose, modification/withdrawal by other means will not be accepted. In online system of bid submission, the modification and consequential re-submission of bids is allowed any number of times. A bidder may withdraw his bid by using the appropriate option for bid withdrawal, before the deadline for submission of bids, however, if the bid is withdrawn, re-submission of the bid is not allowed (or allowed **if specified in BDS).**
	24.2 Bids requested to be withdrawn in accordance with ITB 24.1 shall not be opened.
	24.3 No Bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of Bids and the expiration of the period of Bid validity specified by the Bidder on the Letter of Bid or any extension thereof. This will result in the forfeiture of the Bid Security pursuant to ITB 19.7.
E. Public Opening of Technical Parts of Bids	
25. PublicOpening of Technical Parts of Bids	25.1 The Employer shall publicly open Technical Parts of 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, and this could also be viewed by the bidders online. The Financial Parts of the bids shall remain unopened in the e-procurement system, until the subsequent public

	opening, following the evaluation of the Technical Parts of the Bids. In all cases, original documents submitted as specified in ITB 12.3 shall be first scrutinized, and Bids that do not comply with the provisions of ITB 12.3 will be declared non-responsive and will not be opened. Thereafter, bidders' names,the presence or absence of a Bid Securityor Bid Securing Declaration, if one was required, alternative bids – technical parts, if any, and such other details as the Employer may consider appropriate will be notified,online by the Employer at the time of bid opening. In the event of the specified date of bid opening being declared a holiday for the Employer, the bids will be opened at the appointed time and location on the next working day. 25.2 The electronic summary of the bid opening will be generated and uploaded online. The Employer will also prepare minutes of the Bid opening, including the information disclosed and upload the same for viewing online. Only Technical Parts of Bids, and technical parts of Alternative Bids if any, that areopened at technical Bid opening shall be considered further for evaluation.
F. Evaluation of Bids – General Provisions	
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 45. In cases where ITB 45 is not applicable, such information shall not be disclosed until Notification of Award is transmitted in accordance with ITB 47.
	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 giving 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 36.
	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. Nonmaterial Nonconformities	29.1 Provided that a Bid is substantially responsive, the Employer may waive any nonconformities in the Bid which do not constitute a material deviation, reservation or omission.
	29.2 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 or substance of the Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.
	29.3 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 nonconforming item or component in the manner **specified in the BDS**.
G. Evaluation of Technical Parts of Bids	

30. Evaluation of Technical Parts	30.1 In evaluating the Technical Parts of each Bid, the Employer shall use the criteria and methodologies listed in this ITB and Section III, Evaluation and Qualification Criteria. No other evaluation criteria or methodologies shall be permitted.
31. Determination of Responsiveness	31.1 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. 31.2 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.
	31.3 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 havebeen met without any material deviation, reservation or omission.
	31.4 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.
32. Qualification of the Bidder	32.1 The Employer shall determine to its satisfaction whether the eligible Bidders that have submitted substantially responsive Bid - Technical Parts meet the qualifying criteria specified in Section III, Evaluation and Qualification Criteria.
	32.2 The determination shall be based upon an examination of the documentary evidence of the 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 different from the Bidder.
	32.3 If a Bidder does not meet the qualifying criteria specified in Section III, Evaluation and Qualification Criteria, its Bid shall be rejected by the Employer and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.
	32.4 Only Bids that are both substantially responsive to the bidding document, and meet all Qualification Criteria shall have the Financial Parts of their Bids opened at the second public opening.
33. Subcontractors	33.1 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. 33.2 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. 33.3 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.
H. Public Opening of Financial Parts of Bids	
34. Public Opening of Financial Parts	34.1 Following the completion of the evaluation of the Technical Parts of the Bids, and the Bank has issued its no objection (if applicable), the Employer shall notify in writing those Bidders whose Bids were considered non-responsive to the bidding document or failed to meet the Qualification Criteria, advising them of the following information:
	(a) the grounds on which their Technical Part of Bid failed to meet the requirements of the bidding document; (b) their Financial Part of Bid shall not be opened; and

	(c) notify them of the date, time, and locationfor public opening of Financial Parts of the Bids.
	34.2 The Employer shall, simultaneously, notify in writing those Bidders whose Technical Part have been evaluated as substantially responsive to the bidding document and met all Qualifying Criteria, advising them of the following information: (a) their Bid has been evaluated as substantially responsive to the bidding document and met the Qualification Criteria; (b) their Financial Part of Bid will be opened at the public opening of the Financial Parts; and (c) notify them of the date,time and location for public opening of the Financial Parts of the Bids, **as specified in the BDS.**
	34.3 The opening date should allow Bidders sufficient time to make arrangements for attending the opening. The Financial Part of the Bids shall be opened publicly in the presence of Bidders' designated representatives and anyone who chooses to attend, and this could also be viewed by the bidders online. The bidder's names, the Bid prices, per lot (contract) if applicable, including any discounts and Alternative Bid - Financial Part if any, and such other details as the Employer may consider appropriate, will be notified online by the Employer at the time of bid opening. In the event of the specified date of bid opening being declared a holiday for the Employer, the bids will be opened at the appointed time and location on the next working day.
	34.4 The electronic summary of the bid opening will be generated and uploaded online. The Employer will also prepare minutes of the Bid opening, including the information disclosed and upload the same for viewing online. Only Financial Parts of Bids, Financial Parts of Alternative Bids,and discounts that are opened at Bid opening shall be considered further for evaluation.
I. Evaluation of Financial Parts of Bids	
35. Evaluation of Financial Parts	35.1 To evaluate the Financial Part, 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 for

	admeasurement contracts, but including Dayworkitems, where priced competitively;
	(b) price adjustment for correction of arithmetic errors in accordance with ITB 36.1;
	(c) price adjustment due to discounts offered in accordance with ITB 14.4;
	(d) Not used; (e) price adjustment due to quantifiable nonmaterial nonconformities in accordance with ITB 29.3;and
	(f) the additional evaluation factors are specified in Section III, Evaluation and Qualification Criteria.
	35.2 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in Bid evaluation.
	35.3 If this bidding document allows Bidders to quote separate prices for different lots (contracts), the methodology to determine the lowest evaluated cost of the contract combinations, including any discounts offered in the Letter of Bid – Financial Part, is specified in Section III, Evaluation and Qualification Criteria
36. Correction of Arithmetical Errors	36.1 In evaluating the Financial Part of each Bid, the Employer shall correct arithmetical errors on the following basis: (a) only for admeasurement contracts, 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; (b) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and (c) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.
	36.2 Bidders shall be requested to accept correction of arithmetical errors. Failure to accept the correction in accordance with ITB

	36.1, shall result in the rejection of the Bid and the Bid Security may be forfeited in accordance with ITB Sub-Clause 19.7.
37. Conversion to Single Currency	37.1 Not used.
38. Margin of Preference	38.1 Not applicable.
39. Comparison of Financial Parts	39.1 The Employer shall compare the evaluated costs of all responsive and qualified Bids to determine the Bid that has the lowest evaluated cost.
40. Abnormally Low Bids	40.1 An Abnormally Low Bid is one where the Bid price, in combination with other constituent elements of the Bid, appears unreasonably low to the extent that the Bid price raises material concerns as to the capability of the Bidder to perform the Contract for the offered Bid price. 40.2 In the event of identification of a potentially Abnormally Low Bid, the Employer, unless otherwise **specified in the BDS**, 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. 40.3 After evaluation of the price analyses, in the event that the Employerdetermines that the Bidder has failed to demonstrate its capability to perform the Contract for the offered Bid Price, the Employershall reject the Bid.
41. Unbalanced or Front-Loaded Bids	41.1 If the Bid for an admeasurement contract, which results in the lowest evaluated costis, 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 (with breakdown of unit rates) to demonstrate the consistency of the Bid prices with the scope of works, proposed methodology, schedule and any other requirements of the bidding document. 41.2 After the evaluation of the information and detailed price analysis presented by the Bidder, the Employer may as appropriate: (a) accept the Bid without any additional Performance Security; or

	(b) require that the amount of the Performance Security be increased at the expense of the Bidder to a level not exceeding twenty percent (20%) of the Contract Price to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract; or (c) reject the Bid if the risk cannot be mitigated through additional performance security.
42. Most Advantageous Bid	42.1 Having compared the evaluated costs of Bids, 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: (a) substantially responsive to the bidding document; and (b) the lowest evaluated cost.
43. Employer'sRight to Accept Any Bid, and to Reject Any or All Bids	43.1 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 documents submitted and specifically, Bid securities, shall be promptly returned to the Bidders.
44. Standstill Period	44.1 Standstill Period shall not apply.
45. Notice of Intention to Award	45.1 Not used.
J. Award of Contract	
46. Award Criteria	46.1 Subject to ITB 43, 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 as specified in ITB 42.
47. Notification of Award	47.1 Prior to the expiration of the Bid Validity Period, the Employer shall transmit the Letter of Acceptance to the successful Bidder. The Letter of Acceptance shall specify the sum that the Employer will pay the Contractor in consideration of the execution of the contract (hereinafter and in the Conditions of Contract and Contract Forms called "the Contract Price").

	47.2 Within ten (10) Business Days after the date of transmission of the Letter of Acceptance, the Employer shall publish the Contract Award Notice which shall contain, at a minimum, the following information: (a) name and address of the Employer; (b) name and reference number of the contract being awarded, and the 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; and (e) the name of the successful Bidder, the final total contract price, the contract duration and a summary of its scope.
	47.3 The Contract Award Notice shall be published on a National website (GoI website http://tenders.gov.in or GoI Central Public Procurement Portal https://eprocure.gov.in/cppp/) or on the Employer's website, and on the e-procurement system.
	47.4 Until a formal contract is prepared and executed, the notification of award shall constitute a binding Contract.
48. Debriefing by the Employer	48.1 Not used.
49. Signing of Contract	49.1 Promptly upon Notification of Award, the Employer shall prepare the Contract Agreement, and keep it ready in the office of the Employer for the signature of the Employer and the successful Bidder, within 21 days following the date of Letter of Acceptance.The Contract Agreement shall incorporate all agreements between the Employer and the successful Bidder.
	49.2 Within twenty-one (21) days of receipt of the Letter of Acceptance, the successful Bidder shall (a) furnish the performance security and if required in the BDS, the Environmental and Social (ES) Performance Security in accordance with ITB Clause 50 and revised construction methodology; (b) if the successful bidder is a JV, it shall also furnish the JV agreement duly signed by all the members, if it had submitted only a letter of intent to execute the JV agreement alongwith the bid; and (c) shall sign, date and return the

		Agreement to the Employeralongwith the documents stated at (a) and (b) above.
50. Performance Security	50.1	Within twenty-one (21) 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 (ES) Performance Securityin accordance with the General Conditions of Contract, subject to ITB 41.2 (b), using for that purpose the Performance Security and ES Performance Security Forms included in Section X, Contract Forms. The performance security and if required in the BDS, the Environmental and Social (ES) Performance Security of a Joint Venture shall be in the name of the Joint Venture specifying the names of all members.
	50.2	Failure of the successful Bidder to submit the above-mentioned Performance Security and if required in the BDS, the Environmental and Social (ES) Performance Securityor to sign the Contract Agreement 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.
	50.3	Upon the successful Bidder's signing the Agreement and furnishing of the Performance Security and if required in the BDS, the Environmental and Social (ES) Performance Security pursuant to ITB Clause 50.1, the Employer shall promptly notify the name of the winning bidder to each unsuccessful bidder and shall discharge the Bid Securities of the bidders pursuant to ITB Clause 19.5 and 19.6.
51. Adjudicator	51.1	The Employer proposes the person **named in the BDS** to be appointed as Adjudicator under the Contract, at the daily fee **specified in the BDS**, plus reimbursable expenses (actual boarding, lodging, travel and other incidental expenses). If the Bidder disagrees with this proposal, the Bidder should so state in his Bid. If, in the Letter of Acceptance, the Employer does not agree on the appointment of the Adjudicator, the Employer will

	request the Appointing Authority designated in the Particular Conditions of Contract (PCC) pursuant to Clause 23.1 of the General Conditions of Contract (GCC), to appoint the Adjudicator.

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.

<table>
<tr><th>ITB Reference</th><th>A. General</th></tr>
<tr><td>ITB 1.1</td><td>The Employeris: The Chief Engineer,
Water Resources Department, Assam
The reference number of the Request for Bids (RFB) is:
WRD/WB/Beki Pkg 1

The name of the RFB is: Construction & upgrading of river works along the Beki River for reducing flood and river erosion risks.

<table>
<tr><th>Lot/Contract no.</th><th>Brief description of Works</th></tr>
<tr><td>1</td><td>River bank protection work At Elengbari, at Safakamar and Katajar and Chunbari area including upgradation of embankment at Ch. 2780 to 6780m.(L/B), located along the left bank of Beki River with provision of construction of apron with silt filled geobags in crates and geobags over geo filter media and toe key with PVC coated crates filled with geobags including porcupine works.as per the specifications.</td></tr>
<tr><td>2</td><td>River bank protection work at Dumunighat and Nisuka, Salsalia, Bordonga and Guileza-Mowamari, Sawpur and Choudhury Bazar area located along the both bank of Beki River with provision of construction of apron with silt filled geobags in crates and geobags over geo filter media and toe key with PVC coated crates filled with geobags including porcupine works.as per the specifications</td></tr>
</table>
</td></tr>
<tr><td>ITB 1.2</td><td>The Employer shall use the e-procurement system specified in BDS 7.1.</td></tr>
<tr><td>ITB 2.1</td><td>The Borrower is: Government of India. The sub-Borrower is State of Assam

Loan or Financing Agreement amount: US$ 100million</td></tr>
</table>

	The name of the Project is: **ASSAM INTEGRATED RIVER BASIN MANAGEMENT PROJECT (AIRBMP)**
ITB 4.1	Bids from Joint ventures are acceptable. Following shall apply in case a bidder participates as a Joint Venture: (a) Maximum number of members in the Joint Venture (JV) shall be: **2 (TWO)** (b) Place where the agreement to form JV is to be registered: Guwahati (c) A statement to the effect that all members of the joint venture shall be jointly and severally liable for the execution of the entire Contract in accordance with the Contract terms, shall be included in the authorization nominating a Representative or member in charge, as well as in the Bid and in the Agreement [*in case of a successful bid*]. (d) The joint venture agreement should define precisely the division of assignments to each member of JV. All members of JV should have active participation in the execution during the currency of the contract. The JV Agreement should not be varied/ modified subsequently without prior approval of the Employer.
ITB 4.5	A list of debarred firms and individuals is available on the Bank's external website: http://www.worldbank.org/debarr.
B. Contents of Bidding Document	
ITB 7.1	**Electronic – Procurement System** ***https://assamtenders.gov.in/*** Requests for clarifications should be received by the Employer via the e-tendering portal no later than 14 days prior to the deadline for submission of bids.
ITB 7.4	A Pre-Bid meeting shall take place on: 01-03-2022 at 12.30 Hours The Pre-Bid meeting will also be connected virtually through live video conference, for which the electronic connection link will be sent through email by the Employer - two (2) calendar days before the meeting. **For obtaining the electronic connection link, the participating bidders must submit a request through e-mail** at least 2(two) calendar days before the scheduled date of pre-bid meetingto the Employer at the mail ID given below: worldbank.wrd@gmail.com A site visit conducted by the Employer "**shall not be**" organized.
ITB 8.2	Any addendum/corrigendum issued shall be part of the bidding document and shall be communicated to all the bidders via the e tender portal. The

	Employer shall not be liable for any information not received by the bidder. It is the bidders' responsibility to verify the e tender portal for the latest information related to this bid.
C. Preparation of Bids	
ITB 11.2 (b)	Scanned copy of the original Bid Security shall be submitted/uploaded with the Technical Part of Bid for each lot/contract for which the Bidder submits its bid. Original Bid Security shall be submitted in the manner specified in ITB 12.3.
ITB 11.2 (c)	Not permissible
ITB 11.3 (c)	Not permissible
ITB 11.2 (j)	The Bidder shall submit the following additional documents in its Bid: (i) Contractor Registration certificate as per RFB. (ii) **Code of Conduct for Contractor's Personnel (ES)** The Bidder shall submit its Code of Conduct that will apply to Contractor's Personnel (as defined in Sub-Clause 1 (ii) of the General Conditions of Contract), to ensure compliance with the Contractor's Environmental and Social (ES) 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 (ES) risks** The Bidder shall submit Management Strategies and Implementation Plans (MSIPs) to manage the following key Environmental and Social (ES) risks: • Licensing Requirement • Workforce management plan under COVID 19 considerations • Labour Camp Management Plan • Resource Planning (water, raw materials, electrical wiring, temporary storage, transportation etc.) • Pollution Prevention Plan • Occupation Health & Safety and Emergency Management Plan • GBV Plan • Code of Conduct • Training Plan
ITB 11.3 (d)	The Bidder shall submit the following additional documents in its Bid: Nil

<table>
<tr><td>ITB 12</td><td>Note for Bidders: Bidders have to submit the bids only on the e-procurement portal viz www.assamtenders.gov.inalong with the relevant required documents. For this purpose, the bidders shall fill up online, the forms that are available for online filling on the e-portal. The rest of the forms shall be downloaded by the bidders and filled up. The filled up pages shall then be scanned and uploaded on the e-procurement portal along with the scanned copies of the supporting documents.
Note: No Hard Copies shall be entertained</td></tr>
<tr><td>ITB 12.3</td><td>The bidders are required to separately submit (a) original bid security and (b) original affidavit regarding correctness of information furnished with bideither by registered/speed post/courier or by handso as to reachthe office of the Employer given below before the bid submission deadline, failing which the bids will be declared non-responsive and will not be opened.
For submission of original documents, the Employer’s address is:

Attention: Office of the Chief Engineer,
5th Floor, Assam Water Center
Street Address: Kundil Nagar, Basistha
City: Guwahati
PIN/Postal Code: 781029
Country: INDIA</td></tr>
<tr><td>ITB 13.1</td><td>Alternative Bids shall not be permitted.</td></tr>
<tr><td>ITB 13.2</td><td>Alternative times for completion shall not bepermitted.</td></tr>
<tr><td>ITB 13.3</td><td>Not Applicable</td></tr>
<tr><td>ITB 13.4</td><td>Alternative technical solutions shall be permitted for the following parts of the Works: Not Applicable</td></tr>
<tr><td>ITB 14.2</td><td>The bidder shall include a fixed amount of Provisional Sum for additional Environmental and Social (ES) outcomes for different lots as under:
<table>
<tr><th>Lot No.</th><th>Provisional Sum for additional ES outcome</th></tr>
<tr><td>1.</td><td>Rs. 1.1 Cr</td></tr>
<tr><td>2.</td><td>Rs. 1.24 Cr</td></tr>
</table></td></tr>
<tr><td>ITB 14.4</td><td>Not applicable</td></tr>
</table>

<table>
<tr><td>ITB 14.5</td><td>The prices quoted by the Bidder shall be subject to adjustment during the performance of the Contract, and for this purpose the Base Date shall be the deadline for submission/uploading of Bid.
The adjustment of contract price will be done in accordance with GCC Clause 49 and corresponding provisions under PCC.</td></tr>
<tr><td>ITB 14.6</td><td>Not applicable</td></tr>
<tr><td>ITB 18.1</td><td>The Bid validity period shall be 120 days.</td></tr>
<tr><td>ITB 19.1</td><td>A bid security shall be required.
The bidder shall submit a Bid security(ies) of the amount(s) specified below for each lot for which bid is submitted as part of the Technical Bid.
<table>
<tr><th colspan="2">Name of Lots</th><th>Location Ref ID (As on Index Map)</th><th>Bid security Amount</th></tr>
<tr><td>Lot-1</td><td>Upgradation of Beki embankment along left bank of Beki River including river bank protection works at Elengbari, Chunbari, Safakamar and Katajar including porcupine interventions.</td><td>(AE-2, AE-3, PR-2, AE-9, AE-10 &RS-1)</td><td>₹ 55.00 Lakhs</td></tr>
<tr><td>Lot-2</td><td>River bank protection works at Dumunighat, Bordonga and Guilenza- Mowamari, Sawpur and Choudhuri Bazar area along the river Beki including porcupine interventions.</td><td>(AE-11, AE-12, AE-17, AE-18, AE-19, AE-20, AE-24 & PR-12)</td><td>₹ 62.00 Lkhs</td></tr>
<tr><td colspan="3">Total</td><td>₹ 117.00 Lakhs</td></tr>
</table>
Note: Bid Security of the amount indicated above is required for each lot. Bidders have the option of submitting one Bid Security for all lots (for the combined total amount for all lots) for which Bids have been submitted, However, if the amount of Bid Security is less than the total required amount, the Employer will determine (based on the lowest cost combination of bids) for which lot or lots the Bid Security amount shall be applied.</td></tr>
<tr><td>ITB 19.3 (d)</td><td>Other types of acceptable securities are:
Fixed Deposit/Time Deposit certificate issued by a Nationalized or Scheduled Bank located in India for equivalent or higher value is acceptable provided it is pledged in favour of the Employer, and such pledging has been noted and suitably endorsed by the bank issuing the certificate.</td></tr>
<tr><td>ITB 19.9</td><td>Deleted</td></tr>
</table>

ITB 20.3	The written confirmation of authorization to sign on behalf of the Bidder shall consist of: (a) Legally valid Power of Attorney is required to demonstrate the authority of the signatory to sign the Bid; and (b) In the case of Bids submitted by an existing or intended JV, the authorization shall be evidenced by a Power of Attorney signed by legally authorized signatories of all the members.
D. Online Submission and Opening of Bids	
ITB 21.1	The Class of DSC required is: Class III of DSC. For details of registration and uploading of bids, bidders are requested to visit the website www.assamtenders.gov.in
ITB 22.1	The deadline for uploading the Bids is: Date: 29-03-2022 Time: 15.00 Hours
ITB 22.2	No print media advertisement will be given for extension of the deadline for the submission of Bids. The bidders are advised to check the e tender portal for any such addendum/corrigendumto the bidding document**.**
ITB 24.1	If the bid submitted on the e portal is withdrawn, re-submission of the bid is allowedthrough e portal (www.assamtenders.gov.in) onlybefore the closing date and time of bid submission.
E. Public Opening of Technical Parts of Bids	
ITB 25.1	The online Bid opening of Technical Parts of Bids shall take place at: Office of the Chief Engineer, 5th Floor, Assam Water Center Street Address: Kundil Nagar, Basistha City: Guwahati PIN/Postal Code: 781029 Country: INDIA Date: 29-03-2022 Time: 15.30 Hours The Technical Part opening meeting will also be connected virtually through live video conference, for which the electronic connection link will be sent through email by the Employer at least five (5) calendar days before the Technical Part opening. **For obtaining the electronic connection link, the**

	participating bidders must submit a request through e-mail to the Employer at the mail ID:worldbank.wrd@gmail.com. Please also refer to BDS under ITB 12.3 regarding submission of original documents.
F. Evaluation of Bids – General Provisions	
ITB 29.3	The adjustment shall be based on the highest price of the item or component as quoted in other substantially responsive Bids, subject to a maximum of the estimated price of the item. 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.
G. Evaluation of Bids - Technical Parts	
ITB 33.1	At this time the Employer ***does not intend*** to execute certain specific parts of the Works by subcontractors selected in advance.
ITB 33.2	***N/A***
ITB 33.3	Subcontracting is allowed up to 25% of the contract value. Please also refer to Para 1.1.(ii) of Section III - Evaluation and Qualification Criteriaand submit details of experience and qualifications of the proposed subcontractors.
H. Public Opening of Financial Parts	
ITB 34.2 (c)	Following the completion of the evaluation of the Technical Parts of the Bids, the Employer will notify all Bidders of the date, time, and location of the public opening of Financial Parts via the Assam tenders Portal (www.assamtenders.gov.in) and also through e-mail. The online bid opening of Financial Parts of Bids shall take place at: Office of the Chief Engineer, 5th Floor, Assam Water Center Street Address: Kundil Nagar, Basistha City: Guwahati PIN/Postal Code: 781029 Country: INDIA The Financial Part opening meeting will also be connected virtually through live video conference, for which the electronic connection link will be sent through email by the Employer well before the Opening Meeting to all the Bidders - while notifying the date, time, and location of the public opening as mentioned above.

J. Award of Contract	
ITB 47.3	The contract award notice, containing information/details specified in ITB 47.2, shall be published on the ASSAM Tenders portal (www.assamtenders.gov.in) and also on the Project websites of FREMAA, Assam i.e., http://fremaa.assam.gov.in and website of WRD, Assam i.e., http://waterresources.assam.gov.in.
ITB 50.1 and 50.2	The successful Bidder shall also be required to submit an Environmental and Social (ES) Performance Security. Throughout this bidding document the term 'performance security', unless the context clearly indicates otherwise, means and includes both 'the performance security and the ES performance security' to be submitted by the successful bidder in the amounts specified in GCC/ PCC 54.
ITB 51	The Adjudicator proposed by the Employer is: Er Haren Kakati. The daily fee for this proposed Adjudicator shall be: Rs 20,000.00 per day of effective hearing plus reimbursable expenses (actual boarding, lodging, travel and other incidental expenses). The biographical data (CV) of the proposed Adjudicator is attached below as Appendix to the BDS.

Appendix to BDS

CV of the Adjudicator proposed by Employer

PERSONAL DETAILS

Name: Mr Haren Kakati

Address

LNB Road, Ward number 6,
PO Mangaldai
District Darrang Assam - PIN 784125
Phone number: 9435088467

Email address: harenkakati@yahoo.com

SPECIALIZATION

Water Management Works:

Specialized in Planning, design, construction of water management structures like sluices, embankment, drainage system etc.

WORK EXPERIENCES

Lecturer in AEC: 1976- 1977 (February)

After joining as Assistant Engineer in Water resources Department (WRD) in 1977, worked as field engineer at different capacities within WRD and retired as Secretary to Govt of Assam, Water Resources Department in February 2015

EDUCATIONAL QUALIFICATIONS

Bachelor of Engineering (BE): Assam Engineering College (AEC) 1976

Master of Engineering (ME): IIT – Roorkee, 1988, Master's degree in Water Resources Development

Section III - Evaluation and Qualification Criteria

1. Technical Part

1.1 Adequacy of Technical Proposal

Evaluation of the Bidder's Technical Proposal will include

(i) an assessment of the Bidder's technical capacity to mobilize key equipment and personnel for the contract consistent with its proposal regarding work methods, scheduling, material sourcing, and quality control/ assurance in sufficient detail and fully in accordance with the requirements stipulated in Section VII, Works' Requirements.

For this purpose, the Bidder should also submit:

A detailed note outlining its proposed methodology and program of construction including Contractor's Environmental and Social, HealthManagement Strategies and Implementation Plans (ES-MSIP), backed with equipment, materials and manpower planning and deployment, duly supported with broad calculations and quality control system/assurance procedures proposed to be adopted, justifying their capability of execution and completion of the work as per technical specifications within the stipulated period of completion as per milestones.

(ii) an assessment of the details of subcontracting elements of works amounting to more than 10% of the bid price; for each element proposed to be sub-contracted furnish details whether the identified Sub-contractor possesses the required qualifications and experiences to execute that element satisfactorily. Bidder shall submit for **each proposed/identified sub-contractor**, details of its experience and qualifications using the forms (i) 'Form EXP – 4.2(a)' and (ii) 'Appendix to Financial Part: Schedules Sub-contracting'included in Section IV.
Bidder may also refer to the requirements specified in ITB 33.3.

(iii) Bidders shall submit an undertaking from each proposed subcontractor to confirm that they have read, understand and will comply with the ES obligations and code of conduct for Contractor's Personnel.

1.2 Multiple Contracts

Pursuant to ITB 35.3 of the Instructions to Bidders, Works for which bids are being invited are grouped in Multiple Lots/Contracts as described in BDS 1.1.

Evaluation for multiple contracts will be as follows:

(a) Award Criteria for Multiple Contracts [ITB 35.3]:

Bidders have the option to Bid for any one or more packages which are being bid (that is – Buridehing packages 1 & 2, and Beki package 1) and for any one or more lots within a package. Bids will be evaluated package-wise, taking into account discounts offered, if any, for combined packages and/or lots within a package. 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 combination of packages and or lots as the case may be.

(b) Qualification Criteria for Multiple Contracts:

Para 2.1 of this Section III describes criteria for qualification for each lot (contract). For multiple lots (contracts), the criterion for qualification is **aggregate minimum requirement for respective lots as specified under items 3.1, 3.2, 4.2(a) of the Table below Para 2.1.** However, with respect to the specific experience under item 4.2 (a), the Employer will select any one or more of the options as identified below:

N is the minimum number of contracts

V is the minimum value of a single contract

(a) For one Contract:

Option 1:

(i) N contracts, each of minimum value V;

Or

Option 2:

(i) N contracts, each of minimum value V; or

(ii) Less than or equal to N contracts, each of minimum value V, but with total value of all contracts equal or more than N x V.

(b) For multiple Contracts

Option 1:

(i) Minimum requirements for combined contract(s) shall be the aggregate requirements for each contract for which the Bidder has submitted Bids as follows, and ***N1, N2, N3, etc. shall be different contracts***:

Lot 1: N1 contracts, each of minimum value V1;

Lot 2: N2 contracts, each of minimum value V2;

Lot 3: N3 contracts, each of minimum value V3;

----etc.

or

Option 2:

(i) Minimum requirements for combined contract(s) shall be the aggregate requirements for each contract for which the Bidder has submitted Bids as follows, and ***N1, N2, N3, etc. shall be different contracts***:

Lot 1: N1 contracts, each of minimum value V1;

Lot 2: N2 contracts, each of minimum value V2;

Lot 3: N3 contracts, each of minimum value V3;

----etc., **or**

(ii) Lot 1: N1 contracts, each of minimum value V1; or number of contracts less than or equal to N1, each of minimum value V1, but with total value of all contracts equal or more than N1 x V1.

Lot 2: N2 contracts, each of minimum value V2; or number of contracts less than or equal to N2, each of minimum value V2, but with total value of all contracts equal or more than N2 x V2.

Lot 3: N3 contracts, each of minimum value V3; or number of contracts less than or equal to N3, each of minimum value V3, but with total value of all contracts equal or more than N3 x V3.

----etc.

Or

Option 3:

(i) Minimum requirements for combined contract(s) shall be the aggregate requirements for each contract for which the Bidder has bid for as follows, and ***N1, N2, N3, etc. shall be different contracts***:

Lot 1: N1 contracts, each of minimum value V1;

Lot 2: N2 contracts, each of minimum value V2;

Lot 3: N3 contracts, each of minimum value V3;

----etc., **or**

(ii) Lot 1: N1 contracts, each of minimum value V1; or number of contracts less than or equal to N1, each of minimum value V1, but with total value of all contracts equal or more than N1 x V1.

Lot 2: N2 contracts, each of minimum value V2; or number of contracts less than or equal to N2, each of minimum value V2, but with total value of all contracts equal or more than N2 x V2.

Lot 3: N3 contracts, each of minimum value V3; or number of contracts less than or equal to N3, each of minimum value V3, but with total value of all contracts equal or more than N3 x V3.

----etc., or

(iii) Subject to compliance as per (ii) above with respect to minimum value of single contract for each lot, total number of contracts is equal or less than N1 + N2 + N3 +--but the total value of all such contracts is equal or more than N1 x V1 + N2 x V2 + N3 x V3 +---.

1.3 Alternative Technical Solutions for specified parts of Works(ITB 13.4)– Not Applicable

1.4 Specialized Subcontractors

If permitted under ITB 33, only the specific experience of Subcontractors for specialized works permitted by the Employer will be considered. 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.

2.1 Qualification Criteria

Pursuant to ITB 32.1, the Employer shall assess each Bid against the Qualification Criteria tabulated below. Requirements not included in the text below shall not be used in the evaluation of the Bidder's qualifications.

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended) where permitted			Submission Requirements
				All members Combined	Each Member	At least one 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
2. Historical Contract Non-Performance							
2.1	**History of Non-Performing Contracts**	Non-performance of a contract did not occur as a result of contractor default since 1st January 2006.	Must meet requirement[7&8]	Must meet requirements	Must meet requirement[1]	N/A	Form CON-2

[1] 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) where permitted			Submission Requirements
				All members Combined	Each Member	At least one Member	
2.2	**Suspension Based on Execution of Bid/ Proposal Securing Declaration by the Employer or withdrawal of the Bid within Bid validity period**	Not under suspension based on execution of a Bid/ Proposal Securing Declaration pursuant to ITB 4.7 or withdrawal of the Bid pursuant 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 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 decisions against the Bidder[2] since 1st January *2016*	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Form CON – 2
2.5	**Declaration: Environmental and Social (ES) 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	Must make the declaration. Where there are Specialized Sub-contractor/s, the Specialized	N/A	Each must make the declaration. Where there are Specialized Sub-contractor/s, the Specialized Sub-contractor/s must also make the declaration.	N/A	Form CON-3 ES Performance Declaration

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

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended) where permitted			Submission Requirements
				All members Combined	Each Member	At least one Member	
		obligations in the past five years[3].	Sub-contractor/s must also make the declaration.				
3. Financial Situation and Performance							
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 of amounts specified below for the respective lots/contracts. Lot-1 ₹ 14.00 Cr Lot-2 ₹ 16.00 Cr Total **₹ 30.00 Cr**	Must meet requirement	Must meet Requirement	Must meet at least 25% of the requirement as a minimum	Must meet at least 60% of the requirement as a minimum	Form FIN – 3.1, with attachments and Form FIN – 3.3
		(ii) The Bidders shall also demonstrate, to the satisfaction of the Employer, that it has adequate sources of finance to meet the cash flow requirements on works	Must meet requirement	Must meetrequirement	N/A	N/A	Form FIN – 3.1, with attachments and Form FIN – 3.3

[3]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) where permitted			Submission Requirements
				All members Combined	Each Member	At least one Member	
		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.	Must meet requirement	N/A	Must meet requirement	N/A	
3.2	**Average Annual Construction Turnover**	Minimum average annual construction turnover of amount specified below for the respective lot/contract, calculated as total certified payments received for contracts in progress and/or completed within the last five financial years, divided by five years. Lot-1 ₹ 55.00 Cr Lot-2 ₹ 62.00 Cr Total **₹117.00 Cr**	Must meet requirement	Must meet requirement	Must meet at least 25% (twenty five percent)of the requirement	Must meet at least 60% (sixty percent)ofthe requirement	Form FIN – 3.2
4. Experience							
4.1 (a)	**General Construction Experience**	Experience under construction contracts (indicate details of acceptable similar works) in the role of prime contractor, JV member, sub-contractor, or management	Must meet requirement	N.A.	Must meet the requirement	N.A.	Form EXP – 4.1

<table>
<tr><th colspan="3">Eligibility and Qualification Criteria</th><th colspan="4">Compliance Requirements</th><th>Documentation</th></tr>
<tr><th rowspan="2">No.</th><th rowspan="2">Subject</th><th rowspan="2">Requirement</th><th rowspan="2">Single Entity</th><th colspan="3">Joint Venture (existing or intended) where permitted</th><th rowspan="2">Submission Requirements</th></tr>
<tr><th>All members Combined</th><th>Each Member</th><th>At least one Member</th></tr>
<tr><td></td><td></td><td>contractor for at least the last 5 years, starting 1st January 2016.</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>4.2 (a)</td><td>Specific Construction & Contract Management Experience</td><td>Contract(s) of a similar nature (see below), for each of the respective lots/contracts for which Bid is submitted of minimum value specified below that has/have been satisfactorily and substantially completed as a prime contractor, joint venture member, management contractor or sub-contractor between 1st January 2016 and bid submission deadline.

<table><tr><td>Lot no.</td><td>Minimum value of one similar contract</td></tr><tr><td>Lot-1</td><td>Rs 44 Crores</td></tr><tr><td>Lot-2</td><td>Rs 50 Crores</td></tr><tr><td>Total</td><td>Rs 94 Crores</td></tr></table>
Contracts of a similar nature include river works, coastal works, bridges, ports and harbors, etc, that involve working in a wet and dynamic environment, and involve:

1. Installation of geobags, including</td><td>Must meet requirement</td><td>Must meet requirement[4]</td><td>Must meet the requirement for one contract of minimum 25% value</td><td>Must meet the requirement for one contract of minimum 100% value</td><td>Form EXP 4.2(a)</td></tr>
</table>

[4]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) where permitted			Submission Requirements
				All members Combined	Each Member	At least one Member	
		geo-textiles, for water erosion purposes; and/or installation of concrete blocks or structures, including geotextiles as appropriate, for water erosion or water control purposes or for road construction or for railways (rail roads) constrtuction; **and** 2. Construction of earthen embankments for water control purposes or for road construction or for railways (rail roads) constrtuction.					
4.2 (b)	**Bid Capacity:** Bidders who meet the minimum qualification criteria will be qualified only if their available bid capacity for construction work is equal to or more than the total bid value of the lots/contracts for which the Bidder is determined to have submitted the Most Advantageous Bid(s). The available bid capacity will be calculated as under: Assessed Available bid capacity = (A*N*1.15-B) Where, A = Maximum value of civil engineering works executed in any one year during the last five years (updated to the price level of the financial year 2021 at the rate of 5% per year), taking into account the completed as well as works in progress). N = Number of years prescribed for completion of the works for which bids are invited (period up to 6 months to be taken as half-year and more than 6 months as one year). B = Value, at the current price level, of existing commitments on on-going works to be completed during the period of completion of the works for						

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended) where permitted			Submission Requirements
				All members Combined	Each Member	At least one Member	
	which bids are invited. Note: the statements in Section IV showing the value of existing commitments of on-going works as well as the stipulated period of completion remaining for each of the works listed should be countersigned by the Engineer in charge, not below the rank of an Executive Engineer or equivalent.						

3. Key Personnel

The Bidder must demonstrate that it will have suitably qualified (and in adequate numbers) minimum Key Personnel, as described in the Table below, that are required to perform the Contract.

The Bidder shall provide details of the Key Personnel and such other Key Personnel that the Bidder considers appropriate, together with their academic qualifications and work experience. The Bidder shall complete the relevant Forms in Section IV, Bidding Forms.**If a Bidder submits bids for more than one lot/contract, it should propose different Key Personnel for each Lot/Contract.**

The Contractor shall require the Employer's consent to substitute or replace the Key Personnel (reference the Particular Conditions of Contract 9.1).

Key Personnel

Item No.	Position/ specialization	Relevant academic qualifications	Minimum years of work experience	Work experiences in the River management works
1	Contractor's Representative	Any Post Graduation	15 years	10 years in river project implementation
2	Project Manager	B.E Civil	15 years	10 years in river protection work
3	Asst. Project Manager	B.E Civil	10 years	5 years in river protection work
4	Site Engineer	B.E Civil	5 years	5 years in project work
5	Store In-Charge	Any Graduate	5 years	5 years in project works
Suitable experts in the following specializations				
1	Environmental Specialist	Should have Engineering B.Tech/M. Tech/ BE/ ME/ MSc. degree in Environmental Engineering/ Environmental Science or relevant subjects.	More than 5 years' experience in the relevant field and must have experience of working in minimum 1 externally aided project (funded by	

			World Bank, ADB etc.)	
2	Social Specialist	Should have at least MA degree in Sociology/ Social Work or equivalent subjects	More than 5 years' experience in the relevant field and must have experience of working in minimum 1 externally aided project (funded by World Bank, ADB etc.)	
3	Health and Safety Supervisor	Should have a Diploma in Construction Safety from reputed institute	More than 5 years in construction industry	

The Bidder must not have in his employment:

[i] the near relations (defined as first blood relations, and their spouses, of the bidder or the bidder's spouse) of persons of the following Departments of the Assam Government.
(a) Water Resources Department
(b) FREMAA
(c) PWD

[ii] without Government permission, any person who retired as a gazetted officer within the last two years.

4. Equipment

The Bidder must demonstrate that it will have access to the (owned/leased/rented) key Contractor's equipment listed hereafter for each Lot/Contract for which it submits the bid:

No.	Equipment Type and Characteristics	Minimum Number required
1	Weighing Machine	10
2	Dumpers	10
3	Excavators	5
4	Auto Level	5
5	Total Station	2
6	In-House Laboratory Equipment	1
7	Power Driven Double Needle Sewing Machine (for Geobags)	20
8	Country Boat (20 Ton Capacity)	5

9	Diving Equipment	1
10	Concrete Mixer	2
11	Vibrator	4
12	Digital Camera	1
13	Water Sprinkler	5
14	Water Tank	2

The Bidder shall provide further details of proposed items of equipment using the relevant Form in Section IV.

Section IV - Bidding Forms

Table of Forms

Letter of Bid – Technical Part

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*]
RFB No.: [*insert number of RFB process*]

To: **[*insert complete name of Employer*]**

We, the undersigned, hereby submit our Bid, in two parts, namely:

(a) the Technical Part, and

(b) the Financial Part

In submitting our Bid, we make the following declarations:

(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 havenot been suspended nor declared ineligible by the Employer based on execution of a Bid-Securing Declaration or Proposal-Securing Declaration in the Employer's Country in accordance with ITB 4.7

(d) **Conformity:**We offer to execute in conformity with the bidding document the following Works: **[***insert a brief description of the Works]*

(e) **Bid Validity Period:**Our Bid shall be valid for a period specified in BDS ITB 18.1 (or as amended if applicable) from the date fixed for the Bid submission deadline specified in BDS 22.1 (or as amended if applicable), and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(f) **Performance Security:** If our Bid is accepted, we commit to obtain a performance security [*and an Environmental and Social (ES) Performance Security,* in accordance with the bidding document;

(g) **One Bid Per Bidder:**We are not submitting any other Bid(s) as an individual Bidder or as a subcontractor, and weare not participating in any other Bid(s) as a Joint Venture

member, and meet the requirements of ITB 4.3, other than alternative Bids submitted in accordance with ITB 13;

(h) **Suspension and Debarment**: We, along with any of our subcontractors, suppliers, consultants, manufacturers, or service providers for any part of the contract, are not subject to, and not controlled by any entity or individual that is subject to, a temporary suspension or a debarment 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;

(i) **State-owned enterprise or institution:**We are not a state-owned enterprise or institution/ We are a state-owned enterpriseor institution but meet the requirements of ITB 4.6[1];

(j) **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;

(k) **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; and

(l) **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; and

(m) **Adjudicator**: We accept the appointment of *[insert name proposed in Bid Data Sheet]* as the Adjudicator.

[or]

We do not accept the appointment of *[insert name proposed in Bid Data Sheet]* as the Adjudicator, and propose instead that *[insert name]* be appointed[2] as Adjudicator, whose daily fees and biographical data are attached.

Name of the Bidder: *[*insert complete name of person signing the Bid*]

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*]

[1]Use one of the two options as appropriate

[2] In case appointment of Adjudicator was proposed from the list provided by an Institution in ITB 51, the replacement should also be proposed from the list of same institution.

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

*****: 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

Technical Proposal

Technical Proposal Forms

- **Key Personnel Schedule**
- **Equipment**
- **Site Organization**
- **Method Statement**
- **Mobilization Schedule**
- **Construction Schedule**
- **Construction Methodology**
- **ES Management Strategies and Implementation Plans**
- **Code of Conductfor Contractor's Personnel (ES)**
- **Sub-contracting elements or works which in aggregate add to more than 10% of Bid price (*for each the qualifications and experiences on the identified subcontractor in the relevant field should be given)***

Note: *Work should not be split into small parts and sub-contracted; but sub-contracting specialized elements of works is acceptable*.

- **Others**
- **Bidder's Qualification**
- **Form of Bid Security - Bank Guarantee**

Appendix to Technical Part: Personnel

Forms for Personnel

Form PER – 1: Key Personnel Schedule

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

Key Personnel

1.	**Title of position:**	
	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: Sexual Exploitation, Abuse and Harassment Expert** *[Where a Project SEA risks are assessed to be substantial or high, Key Personnel shall include an expert with relevant experience in addressing sexual exploitation, sexual abuse and sexual harassment cases]*	
	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:**	
	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*]

Appendix to Technical Part

Form PER-2:

Resume and Declaration

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 [From - To]**	**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 Key Personnel, 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 Key Personnel is available to work on this contract]*
Time commitment:	*[insert the number of days/week/months/ that this Key Personnel will be engaged]*

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

(a) be taken into consideration during Bid evaluation;

(b) result in my disqualification from participating in the Bid;

(c) result in my dismissal from the contract.

Name of Key Personnel: [*insert name*]

Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Bidder:

Signature: _____

Date: (day month year): _____

Appendix to Technical Part: Equipment

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

Type 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**	

The following information shall be provided only for equipment not 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**	

Appendix to Technical Part

Site Organization

[insert Site Organization information]

Appendix to Technical Part

Method Statement

The Environment and Social Management Plan (ESMP) is at Annexure-ESMP of the Bid Documents for the responsibility of the contractor as per the provision of Environmental & Social Management Plan along with other related plans as per the World Bank's Environmental & Social Standards (ESSs). The ESMP cover the relevant findings from the environmental & social assessment along with mitigation measures with implementation responsibilities, environmental monitoring plan, indicative budget, proposed environmental & social training to be conducted by the Contractors &WRD, Assam, Code of conduct, draft for Contractors Environmental & Social Management Plan (C-ESMP) & Environmental Code of Practices (ECoPs) for the contractor.

Hence, the contractor shall strictly abide by the ESMP enclosed as Annexure -ESMP with this bid document to address all the environmental & social safeguard aspect of these sub-projects.

Appendix to Technical Part

Mobilization Schedule

In accordance with the Particular Conditions, Sub-Clause 16.2, the Contractor shall not carry out mobilization to Site unless the Project manager 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.

Appendix to Technical Part

Construction Schedule

[insert Construction Schedule]

The construction schedule shall include the following key milestone - No-objection to the Code of Conduct for Contractor's Personnel andContractor's MSIPs, which collectively form the C-ESMP, in accordance with the Particular Conditions of Contract Sub-Clause 16.2.

Appendix to Technical Part

Environmental and Social, Health 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 11.2 (j) 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 ES provisions of the contract including those as may be more fully described in the Works Requirements in Section VII.

Appendix to Technical Part

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

CODE OF CONDUCT FOR CONTRACTOR'S PERSONNEL

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.

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, laborers and other employees at the Works Site or other places where the Works are being carried out. It also applies to the personnel of each subcontractor and any other personnel assisting us in the execution of the Works. All such persons are referred to as "**Contractor's Personnel"** and are subject to this Code of Conduct.

This Code of Conduct identifies the 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 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 women, children (persons under the age of 18), and men with respect regardless of race; colour; language; religion; political or other opinion; national, ethnic or social origin; sexual orientation or gender identity; disability; birth or other status.
6. Not use language or behaviour towards women, children or men that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
7. not engagein 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;
8. 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;
9. 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;
10. Understand that unless there is the full consent by all parties involved, sexual interactions between the company's employees (at any level) and members of the surrounding communities are prohibited. This includes relationships involving the withholding or promise of monetary or non-monetary reward.
11. complete relevant training courses that will be provided related to the environmental and social aspects of the Contract, including on health and safety matters, and Sexual Exploitation, and Abuse (SEA) and Sexual Harassment (SH);
12. report violations of this Code of Conduct; and
13. 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.

RAISING CONCERNS

If any person observes behaviour 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 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): _____

COMPANY CODE OF CONDUCT - This Code of Conduct is part of our measures to deal with environmental and social risks related to the Works. *This company-level code of conduct should be* ***signed by the Project Manager****, and shared throughout the company.*

[Company] is committed to creating and maintaining an environment in which gender-based violence (GBV) has no place, and in which it will not be tolerated by any employee, associate, or representative of the company. Therefore, in order to ensure that all employees, associates, and representatives of [Company] are aware of this commitment, and in order to prevent, identify, and respond to any allegations of GBV, the following core principles and minimum standards of behaviour will apply to all company employees, associates, and representatives without exception:

1. [Company] will 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 Personnel and any other person.
2. [Company]—and therefore all employees, associates, and representatives—commit to treating women, children (persons under the age of 18), and men with respect, regardless of race; color; language; religion; political or other opinion; national, ethnic or social origin; sexual orientation or gender identity; disability; birth or other status. GBV is in violation of this commitment.
3. In the eyes of [Company], GBV constitutes acts of gross misconduct and is therefore grounds for sanction, which may include penalties and/or termination of employment. All forms of GBV are unacceptable, regardless of whether they take place on the worksite, the worksite surroundings, at workers' camps, or off-site (i.e. involving individuals not employed by the company). In addition to the potential sanctions listed above, legal prosecution will be pursued, if appropriate, for any employees, associates, and representatives alleged to have committed GBV.
4. Demeaning, threatening, harassing, abusive, or sexually provocative language and behaviour are prohibited among all company employees, associates, and representatives.
5. Sexual favours—for instance, making promises or favourable treatment dependent on sexual acts—are prohibited.
6. Unless there is the full consent by all parties involved, sexual interactions between the company's employees (at any level) and members of the surrounding communities are prohibited. This includes relationships involving the withholding or promise of monetary or non-monetary reward.
7. All employees, including volunteers and sub-contractors are expected to report suspected or actual GBV by a fellow worker, whether in the same company or not. Reports must be made in accordance with GBV allegation procedures.
8. All employees are required to be trained on joining work to ensure they are familiar with the GBV Code of Conduct.
9. All employees will be required to sign a code of conduct for Contractor's Personnel confirming their agreement to comply to the same.

I do hereby acknowledge that I have read the foregoing Code of Conduct, and on behalf of the company agree to comply with the standards contained therein. I understand my role and responsibilities to prevent and respond to my employees'' grievances. I understand that any action inconsistent with this Code of Conduct or failure to take action mandated by this Code of Conduct may result in disciplinary action.

Signature: _____

Name of Project Manager: _____

Company Name: _____

Date: _____

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:

(1) **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.

(2) **Examples of sexual harassmentin 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.

Appendix to Technical Part

Others

Appendix to Technical Part

Bidder's Qualification

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

Appendix to Technical Part

Form ELI -1.1: Bidder Information Form

Date: _____
RFB No. and title: _____
Page_____of _____pages

Bidder's legal name
In case of Joint Venture (JV), legal 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. ☐ Authorization to represent the firm or JV named in above, in accordance with ITB 20. ☐ 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.

Appendix to Technical Part
Form ELI -1.2: Information Form for JV Bidders

(Where permitted as per BDS ITB 4.1)
(to be completed for each member of Joint Venture)

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

JV Information
Bidder's Joint Venturelegal name:
JVmember'slegal 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. ☐ Authorization to represent the firm or JV named in above, in accordance with ITB 20. ☐ In case of a state-owned enterprise or institution, documents establishing legal and financial autonomy, operation in accordance with commercial law, and is 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.

Appendix to Technical Part

Form ELI -1.2 A

Specialized Subcontractor's Information Form

(to be completed for each Specialized Subcontractor)

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

Bidder's legal name:

Specialized Subcontractor's legal name:
Specialized Subcontractor's country of registration:
Specialized Subcontractor's year of constitution:
Specialized Subcontractor's legal address in country of constitution:
Specialized Subcontractor's authorized representative information Name: _____ Address: _____ Telephone/Fax numbers: _____ E-mail address: _____
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. ☐ Authorization to represent the Specialized Subcontractor.

Appendix to Technical Part

DETAILS OF PARTICIPATION IN THE JOINT VENTURE

PARTICIPATION DETAILS	FIRM 'A' (Lead Member)	FIRM 'B'	FIRM 'C'
Financial			
Name of the Banker(s)			
Planning			
Construction Equipment			
Key Personnel			
Execution of Work (Give details on proposed contribution of each)			

The Joint Venture should indicate the details of participation as above.

Appendix to Technical Part

Form CON – 2: Historical Contract Non-Performance, Pending Litigation and Litigation History

[to be completed for the Bidder and for each member of a Joint Venture]

Bidder's Name: _____
Date: _____
Joint Venture Member's Name_____
RFB No. and title: _____
Page _____of _____pages

Non-Performed Contracts in accordance with Section III, Evaluation and Qualification Criteria			
☐ Contract non-performance did not occur since 1st January *[insert year]*specified in Section III, Evaluation and Qualification Criteria, Sub-Factor 2.1. ☐ Contract(s) not performed since 1st January *[insert year]* specified in Section III, Evaluation and Qualification Criteria, requirement 2.1			
Year	**Non-performed portion of contract**	**Contract Identification**	**Total Contract Amount (Rs.)**
[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 non-performance: *[indicate main reason(s)]*	*[insert amount]*
Pending Litigation, in accordance with Section III, Evaluation and Qualification Criteria			
☐ No pending litigation in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.3. ☐ Pending litigation in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.3 as indicated below.			

Year of dispute	Amount in dispute (Rs.)	Contract Identification	Total Contract Amount (Rs.)
[insert year]	*[insert amount]*	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"]* Status of dispute: *[Indicate if it is being treated by the Adjudicator, under Arbitration or being dealt with by the Judiciary]*	*[insert amount]*
[insert year]	*[insert amount]*	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"]* Status of dispute: *[Indicate if it is being treated by the Adjudicator, under Arbitration or being dealt with by the Judiciary]*	*[insert amount]*
Litigation History in accordance with Section III, Evaluation and Qualification Criteria			
☐ No Litigation History in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4. ☐ Litigation Historyin accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4 as indicated below.			

Year of award	Outcome as percentage of Net Worth	Contract Identification	Total Contract Amount (Rs.)
[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]*

Appendix to Technical Part

Form CON – 3: Environmental and Social(ES) Performance Declaration

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

Bidder's Name: _____*[insert full name]*
Date: _____*[insert day, month, year]*
Joint Venture Member's or Specialized Subcontractor's Name: _____*[insertfull name]*
RFB No. and title: _____*[insert RFB number and title]*
Page _____*[insert page number]* of _____*[insert page number]* 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 or Social (ES) 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 or Social (ES) 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 (Rs.)**
[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. forgender-based violence; sexual exploitation or sexual abusebreaches]*	*[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]*	*[insert amount]*

		Reason(s) for suspension or termination: *[indicate main reason(s)]*	
…	…	*[list all applicable contracts]*	…
Performance Security called by an employer(s) for reasons related to ES performance			
Year	Contract Identification		Total Contract Amount (Rs.)
[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. for gender-based violence; sexual exploitation or sexual abuse breaches]*		*[insert amount]*

Appendix to Technical Part

Form CCC: Current Contract Commitments / Works in Progress

Bidders and each member of 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.

(A) Existing commitments and on-going works:

Description of Work	Place & State	Contract No. & Date	Name and Address of Employer	Value of Contract (Rs. equivalent in million)	Stipulated period of completion	Value of works[1] remaining to be completed (Rs. equivalent in million)	Anticipated date of completion	Average Monthly Invoicing Over Last Six Months (Rs./month) Equivalent in millions)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

(B) Works for which bids already submitted and likely to be awarded – expected additional commitment.

[1] *Attach certificate(s) from the Engineer(s)-in-Charge*.

Description of Work	Place & State	Name and Address of Employer	Estimated value of Works (Rs. equivalent in million)	Stipulated period of completion	Date when decision is expected	Remarks, if any
(1)	(2)	(3)	(4)	(5)	(6)	(7)

Appendix to Technical Part

Form FIN – 3.1: Financial Situation and Performance

[To be completed by the Bidder and by each member of a Joint Venture]

Bidder's Legal Name: _____
Date: _____
Joint Venture Member's Legal Name_____
RFB No. and title: _____
Page _____of _____pages

1. Financial data

Type of Financial information in (Rs.)	**Historic information for previous _____*years*, _____ (amount in Rs.)**				
	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					
This information should be extracted from the Annual Financial Statements/ Balance sheets, which should be enclosed. Year 1 will be the latest year for which audited financial statements are available. Year 2 shall be the year immediately preceding year 1 and year 3 shall be the year immediately preceding Year 2.					

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 (Rs.)
1		
2		
3		

3. Financial documents

The Bidder and its parties shall provide copies of financial statements for five (5)_years pursuant to Section III, Evaluation and Qualifications Criteria, Sub-factor 3.2. 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.In case of Indian bidders, the financial statements shall be audited by a certified chartered accountant.

(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[8](balance sheets, including all related notes, and income statements) for the 5(five) years required above; and complying with the requirements

[8] 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.

Appendix to Technical Part

Form FIN - 3.2: Average Annual Construction Turnover

[To be completed by the Bidder and by each member of a Joint Venture]

Bidder's Legal Name: _____
Date: _____
Joint Venture Member's Legal Name_____
RFB No. and title: _____
Page _____of _____pages

Annual turnover data (construction only)	
Year	**Amount in Rs.**
[indicate year]	*[insert amount]*
Average Annual Construction Turnover *	

* See Section III, Evaluation and Qualification Criteria, Sub-Factor 3.2. Annual construction turnover calculated as total certified payments received for work in progress or completed, for 5 years. This should be certified by a Chartered Accountant.

Appendix to Technical Part
JOINT VENTURE

Names of all members of a joint venture
1. Member in charge
2. Member

Total value of annual construction turnover, in terms of work billed to clients, in Rupees

Annual Turnover Data (construction only; in Rs. *)							
Member	**Form 3.2 page no.**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Average**
1. Member in charge							
2. Member							
3. Member							
TOTALS							

*** To be certified by a chartered accountant**

Name and address of Bankers to the Joint Venture

Provide details regarding financial responsibility and participation (percentage share in the total) of each firm in the Joint Venture. Attach a Memorandum of Understanding for the Proposed Agreement of joint Venture which should lay down responsibility regarding work and financial arrangements in respect of each of the firm in the Joint Venture (Refer also ITB Clause 4.1).

Appendix to Technical Part

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 and also additional credit facilities to meet the cash flow requirements for works currently in progress.

Source of financing	Amount (Rs.)
1.	
2.	
3.	
4.	

FORMAT FOR EVIDENCE OF ACCESS TO OR AVAILABILITY OF CASH FLOW
[To be given from a Nationalized or Scheduled Bank in India]

Clause 3.1(i) & 3.1(ii) of Section III – Qualification Criteria

(1) AVAILABILITY OF CASH FLOW (WORKING CAPITAL)

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

If the contract for the works, namely _____ [funded by the World Bank] is awarded to the above firm, we shall be able to provide overdraft/credit facilities to the extent of Rs. equivalent _____ to meet their capital requirements for executing the above contractand also additional credit facilities to the extent of ……...to meet the cash flow requirements on works currently in progress.

-- Sd. --

Name of Bank Manager

Senior Bank Manager

Address of the Bank

*** Change the text as follows for Joint venture:**

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

*If the contract for the work, namely ……. [funded by the World Bank] is awarded to the above Joint Venture, we shall be able to provide overdraft/credit facilities to the extent of Rs. ……. to meet the working capital requirements for executing the above contract*and also additional credit facilities to the extent of ……to meet the cash flow requirements for works currently in progress.

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

Appendix to Technical Part

Form EXP - 4.1: General Construction Experience

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

Bidder's Legal Name: _____
Date: _____
Joint Venture Member's Legal Name_____
RFB No. and title: _____
Page _____of _____pages

[Identify contracts that demonstrate continuous construction work over the past [5] years pursuant to Section III, Qualification Criteria and Requirements, Sub-Factor 4.1. List contracts chronologically, according to their commencement (starting) dates.]

Starting Month/ Year	Ending Month/ Year	Contract Identification	Role of Bidder *["Contractor" or "JV Member" or "Subcontractor" or "Contract*
		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: _____	

Appendix to Technical Part
Form EXP - 4.2(a): Specific Construction and Contract Management Experience

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

Bidder's Legal Name: _____
Date: _____
Joint Venture Member's Legal Name_____
RFB No. and title: _____
Page _____of _____pages

Work performed as prime Contractor or JV Member or Sub-Contractor or Management Contractor (in the same name and style) on construction works of a similar nature and volume over the last five years[9]. [*Attach certificate from the Engineer-in-charge.*]

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

[9]Immediately preceding the financial year in which bids are received.

Appendix to Technical Part
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. Value of similar contract	
2. Indicative Quantities	
3. Physical size of required works items	
4. Complexity	
5. Methods/Technology	
6. Construction rate for key activities	
7. Quantities of key activities namely Geobags, Geotextile, Concrete blocks, Earthen embankment etc.	
8. Other Characteristics	

Appendix to Technical Part

Form…..

(Name of the Project)

(*Declaration regarding tax/duty exemption for materials/construction equipment bought for the work)*

(*Bidder's Name and Address*)

To: ……..
(*Name of the Employer& address*)

Dear Sir:

Re: [*Name of Work*]…….
Certificate for Import/Procurement of Goods/Construction Equipment
Government Order/Circular Number under which tax/duty Exemption is being sought: …

1. We confirm that we are solely responsible for obtaining tax/duty waivers which we have considered in our bid and in case of failure to receive such waivers for reasons whatsoever, the employer will not compensate us.

2. We are furnishing below the information required by the Employer for issue of the necessary certificates in terms of the Government of India's relevant Notifications.

3. The goods/construction equipment for which certificates are required are as under:

Items *(modify the list suitably for each specific work)**	Make/ Brand Name	Capacity [*where applicable*]	Quantity	Value	State whether it will be procured locally or imported [*if so from which country*]	Remarks regarding justification for the quantity and their usage in works.
Goods						
[a] Bitumen						
[b] Cement						
[c] Steel						
Construction Equipment						

4. We agree that no modification to the above list is permitted after bids are opened.

5. We agree that the certificate will be issued only to the extent considered reasonable by the Employer for the work, based on the Bill of Quantities and the construction program and methodology as furnished by us alongwith the bid.

6. We confirm that the above goods and construction equipment will be exclusively used for the construction of the above work and the construction equipment will not be sold or otherwise disposed of in any manner for a period of five years from the date of acquisition.

Date: _____ (*Signature*)_____
Place:_____ (*Printed Name*)_____
(*Designation*)_____
(*Common Seal*) _____

[***This certificate will be issued within 60 days of signing of contract and no subsequent changes will be permitted.***]

**** Modify the above to suit the requirements given in Government of India's Notifications as current of date of bidding.***

Appendix to Technical Part: Bid Security

Form of Bid Security - Bank Guarantee

[Guarantor letterhead or SWIFT identifier code]

Bank Guarantee No…….[insert guarantee reference number]
Date…….[insert date of issue of the guarantee]

WHEREAS, _____ [name of Bidder][10] (hereinafter called "the Applicant") has submitted his Bid dated _____ [date] or will submit his Bid for the construction of _____ [name of Contract] (hereinafter called "the Bid") under Request for Bids No…….[insert number] (hereinafter called "the RFB")

KNOW ALL PEOPLE by these presents that We _____ [name of bank] of _____ [name of country] having our registered office at _____ (hereinafter called "the Bank") are bound unto _____[name of Employer] (hereinafter called "the Employer") in the sum of _____ [11]for which payment well and truly to be made to the said Employer the Bank binds itself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this _____ day of _____ 20____.

THE CONDITIONS of this obligation are:

(1) If after Bid opening the Applicant (a) withdraws his bid during the period of Bid validity specified in the Letter of Bid, or any extended dateprovided by the Applicant("the Bid Validity Period"); or (b) does not accept the correction of the Bid Price pursuant to ITB 36;

Or

(2) If the Applicant having been notified of the acceptance of his bid by the Employer during the period of Bid validity:

(a) fails or refuses to execute the Contract Agreement in accordance with the Instructions to Bidders, if required; or

(b) fails or refuses to furnish the Performance Securityand if required, the Environmental and Social (ES) Performance Security, in accordance with the Instruction to Bidders.

[10]*Insert name of the Bidder, which in the case of a joint venture shall be (a) the name of the joint venture that submits the bid if the JV has been constituted into a legally enforceable JV, or (b) the names of all future members of the JV as named in the letter of intent to execute the JV Agreement submitted by the bidder alongwith its bid.*

[11]*The Applicant should insert the amount of the guarantee in words and figures denominated in Indian Rupees. This figure should be the same as shown in Clause 19.1 of the Instructions to Bidders.*

we undertake to pay to the Employer up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by him is due to him owing to the occurrence of one or any of the four conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date _____ [12]days after the deadline for submission of Bids as such deadline is stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this guarantee should reach the Bank not later than the above date.

DATE _____ SIGNATURE OF THE BANK _____

WITNESS _____ SEAL _____

_____
[signature, name, and address]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

[12]*45 days after the end of the validity period of the Bid.*

Letter of Bid - Financial Part
(Letter of Bid shall be submitted to the financial folder of e procurement portal)

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*]

To: **[*insert complete name of Employer*]**

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

In submitting our Bid, we make the following additional declarations:

(a) **Bid Validity Period**: Our Bid shall be valid for a period specified in BDS 18.1 (or as amended if applicable) from the date fixed for the Bid submission deadline specified in BDS 22.1 (or as amended if applicable), and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

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

[Option 1, in case of one lot:] Total price is: [*insert the total price of the Bid in Rs. in words and figures*];

Or

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

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

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

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

(d) **Commissions,** gratuities **and 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 complete name of each Recipient, its full address, the reason for which each commission or gratuity was paid and the amount and currency of each such commission or gratuity*].

Name of Recipient	Address	Reason	Amount

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

Name of the Bidder: *[*insert complete name of person signing the Bid*]

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.

**: 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

Appendix to Financial Part: Schedules
Sub-contracting

SCHEDULE OF SUBCONTRACTORS

[Note: Entries in this Schedule shall be the same as included in the same Schedule in the technical part of the bid, except for the column on 'Approximate value of subcontract' added in the table below]

Item	Element of work	Approximate value of subcontract	% of bid price	Name and address of sub-contractor	Qualification and experience of sub-contractor on similar works of the elements executed

The Bidder shall enter in this schedule a list of the major sections and appropriate value of the work for which he proposed to use subcontractors *[for those costing more than 10% of the bid price for each element], together with the names, addresses and experiences of the proposed subcontractors.*

The capability of the subcontractor will also be assessed (on the same lines as for the main Contractor) before according approval to him.

(Work should not be split into small parts and subcontracted; but subcontracting specialized elements of works is acceptable).

Appendix to Financial Part: Schedules

Locations of works under this package "**construction& upgrading of river works along the beki river for reducing flood and river erosion risks**" are as given below:

Pkg. No.	Lot No	Provisions	Location	Reference of location &project ID as per drawing
1	1	Upgradation of Embankment with Bank protection work including porcupine interventions	At Elengbari and Chunbari	**(AE-2, AE-3, PR-2, AE-9, AE-10 &RS-1**
			At Ch. 2780 to 6780m.(L/B)	
			At Safakamar and Katajar	
	2	Bank protection work including porcupine interventions	At Dumunighat and Nisuka	**AE-11, AE-12, AE-17, AE-18, AE-19, AE-20, AE-24 & PR-12**
			At Salsalia, Bordonga and Guileza-Mowamari	
			At Sawpur and Choudhury Bazar	

Bill of Quantities
(Lot-wise)

Bidder's attention is invited to ITB 14.7 which requires that all duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the deadline for submission of Bids, shall be included in the rates and prices and the total Bid price submitted by the Bidder.

BOQ (LOT-1)					
Sl No	**ITEM OF WORKS**	**UNIT**	**QUANTITY**	**RATE**	**AMOUNT (in Rs.)**
1	Clearing medium jungles and trees up to 50cm. girth including cutting, uprooting roots and stumps, removing them from the site of the work, etc. complete as directed. (when 30% to 60% of the area is covered by shrubs trees etc.)	sqm	18966.45		
2	Cutting bamboo, uprooting roots & stumps including removing them from the site of work, etc. complete as directed.	Sqm	4225.00		
3	Felling trees including uprooting roots and stumps upto 50 cm. below ground, cutting into pieces and removing the same from the site of work as directed. Trees above 0.50m and up to 1m girth:	Each	399		
4	Earthwork in grabbing the seat of the embankment. upto 0.3 m depth and depositing the soils outside the country side toe of the proposed structures, etc. complete as directed.	Cum	24671.71		

5	Earth work in embankment by truck carriage in ordinary/normal soil excluding sandy and rocky soil free from roots & vegetation and filling in uniform layers not exceeding 25cm. Thick including ploughing or roughening or benching the seats, removing all debris, breaking clods up to 4cm. cube, dressing as per design section including payment of forest royalty if any, etc. complete as directed. (10% deduction will be made from the section measured quantities of the completed and compacted on account of shrinkage) For initial lead beyond ½ Km and up to 4.00 Km and for all lifts.	Cum	279319.09		
6	Item: Turfing with grass sods of largest possible rectangles of 12cm. Minimum thickness placed closely including dressing earth, pegging with Jati bamboo split, watering till the grass grows for a lead up to 90m and all lifts. (Quantity as per Statement No.9)	Sqm	95512.50		
7	Earthwork in bank trimming to the designed section/ slope including removing the soils at a minimum distance of 30m completed as directed.	Cum	108816.50		

8	Supply of Geo-textile bags of type-A (size 1.03X0.70M), inner dimension made of Geo-textile non-woven fabric sheets of 400 GSM manufactured from 100% virgin Polypropylene (PP) fibre having thickness not less than 3.00 mm with minimum properties as (i) Tensile strength (CD) ≥ 24 KN/m (ii) Tensile strength (MD) ≥ 22 KN/m (iii) Mass ≥ 400.00 Gm/m ^{2} (iv) CBR Puncture strength ≥ 4100 N/m2 (v) Elongation @ break (Warp) ≥ 54% (vi) Elongation @ break (Weft)≥ 52% (vii) Abrasion ≥ 70 % (viii) UV Resistance @ 500 hours ≥ 70% (ix) AOS ≤ 75 micron (x) Permittivity ≥ 1.25, (xi) Trapezoidal Tear Strength ≤ 520 N (xii) Permeability = 45Lt/m2/sec (xiii) Seam strength = 80 % of geotextiles strength . Stitching of Bags should be Ring Spun Yarn stitches with 2500-3000 denier double line chain stitch with overlap with stitches along the edge @ minimum 15 stitches per 100 mm.	Nos.	970207		
	(Bags are to be supplied of 100 numbers or part in a bundle, properly packed with name of Manufacturer and Batch Number is to be marked on each bag with "WRD Govt of ASSAM" to be printed on each bag and mentioning properly the GSM and type of Geo bag polymer. Test Certificate from approved NABL accredited and ISO Certified Laboratory should invariably be submitted				

	against each batch of material). FOR GUWAHATI(Quantity as per Statement No.5)				
9	Supply of Wire -netting box of size 1.50mx 1.50mx 0.45m made with mechanically woven, double twisted , hexagonal shaped wire mesh with wire made of low carbon, high ductile MS wire with heavy class of galvanization with an additional layer of PVC coating with mesh type of 10x12 as per EN 10223 & ASTM A975 , mesh wire of 2.70mm (I.D)/3.70mm(OD)tensile strength of 450-500/mm^2,edge wire/selvedge around it at least 2.5 times, lacing wire (zinc P.V.C. coated) of 2.20mm (I.D.) /3.20mm (O.D) P.V.C. coating thickness of 0.50mm nominal, 0.38mm minimum and with average weight per unit being 12 kg with additional 3% of the weight of box for lacing wire supplied separately, supporting the facing of the box with Zinc coated steel wire of required length as directed, compling with A.S.TM and Europian norms, including payment of all duties,sale tax, any other taxes as applicable	Each	53387		

	loading, unloading and staking them at the site of work in measurable stacks, complete as directed .				

10	Supply of non-woven Geo-textile fabric sheets of 300 GSM manufactured from 100% virgin Polypropylene (PP) fibre with minimum properties as (i) Tensile strength ≥ 12 KN/m (ii) Mass ≥ 300.00 Gm/m ^{2} (iii) CBR Puncture strength ≥ 3.5 KN (iv) Elongation at break ≥ 60% (v) Abrasion ≥ 70 % (vi) UV Resistance @ 500 hours ≥ 70% (vii) AOS ≤ 75 micron (ix) Permittivity ≥ 1.25, (x) Trapezoidal Tear Strength ≤ 340 N (xi) Permeability = 2.00 x 10^{-3} m/sec (xii) Seam strength = 80 % of geotextiles strength . Stitching of Bags should be Ring Spun Yarn stitches with 2500-3000 denier double line chain stitch with overlap with stitches along the edge @ minimum 15 stitches per 100 mm. (Each Roll of Geo Fabric Sheet should be supplied in properly packed Bundles and should be marked with the Name of Manufacturer & Batch Number clearly on each bundle with "WRD Govt of ASSAM" to be printed on it and mentioning properly the GSM and type of polymer and Test Certificate from approved NABL accredited and ISO Certified Laboratory should invariably be submitted against each batch of material)FOR GUWAHATI (Quantity as per Statement No.7)	Sqm	92086.00		

11	Supply of Sewing Thread/Yarn PPMF Stitching Thread (2000 Den. Kaplon) i/c payment of taxes. (Quantity as per Statement No.10)	RM	10672277		
12	Carriage of Geo bags of size 1.03 x 0.70 m including loading & unloading, stacking etc . complete and including hire charge of truck with driver and handyman cost of P.O.L. etc complete as directed. (Distance from Guwahati to Sorbhog = 135Km.)	Bag/Km	970207		
13	Carriage of 300gsm Geo-Sheet including loading & unloading, stacking cost of P.O.L. etc. complete and including hire charge of truck with driver and handyman complete as directed. (Distance from Guwahati to Sorbhog = 135Km.)	Sqm/Km	92086.00		
14	Filling and laying in cage with silt filled Geo bags of size 1.03m X 0.70m excluding excavation of specified silt from flood plain or adjacent chars within a distance of 90m of the work site, filling geo bags with silt having minimum weighing 126.00 Kg and minimum volume 0.084 cum after filling ,double locking chain stitching the mouth of the filled bags with polypropylene thread by power driven double needle machine, stacking the same in batches of 100, carrying the same to the dumping site including all handling charges and local carriage within a distance of 150m and laying	Bag	91524		

	properly. in cages made of wire netting sheets of size 2.57x1.66m of 8G galvanized wire making the cage from 2 nos. of wire netting sheet by tying the projected wires complete as directed. (Silt, Geo Bag, Wire Netting Sheets and Polypropylene thread will be supplied by the department free of cost). a) Without Boat				
	b) With boat (Quantity as per Statement No.5)	Bag	549120		
15	Filling and laying of Geo bags of size 1.03m X 0.70m excluding excavation of specified silt from flood plain or adjacent chars within a distance of 90m of the work site, filling geo bags with silt having minimum weighing 126.00 Kg and minimum volume 0.084 cum after filling ,double locking chain stitching the mouth of the filled bags with polypropylene thread by power driven double needle double stitched machine, stacking the same in batches of 100, carrying the same to the dumping site including all handling charges and local carriage within a distance of 150m and laying properly as directed. (Silt, Geo Bag and Polypropylene thread will be supplied by the department free of cost) a) without boat	Bag	329563		
16	Labour charge for laying Geo fabric sheet as filter belowpitching including anchoring and complete as directed.	Sqm	92086.00		

17	Collection and supply of River silt by truck carriage free from debris and other foreign material payment of forest royalty if any, etc.(For initial Lead beyond 1/2 Km and upto 4.00 km for all lifts.)	Cum	81497.39		
18	Earth work in excavation of drainage channel to the proper grade and slopes as required including deposing the excavated debris/soil to a safe distance of minimum 50 m distance as directed. Normal Soil.	m^3	5720.00		
19	Item : Supply of Pre stressed Cement Concrete (PSC) Porcupine members of size 0.10m X 0.10mX 3.00m with M-30 grade of cement concrete conforming to IS 1343:2012 using super - plasticizer @ 1.2lit /bag of cement with graded broken course aggregate upto 20mm size down conforming to IS 10262:2009 & IS 456:2000 and reinforced with 4 Nos. of 4 mm dia high tensile steel wire cable with necessary cover and 4mm high tensile stirrups at 250mm C/C, in conformity with IS-6403:R2002 and stressed to required strength not exceeding 9.18 N/mm, holes of 16 mm dia at 50 cm inside from both ends in the same face and in either face of post another 2 Nos. of holes of size 16 mm dia at 65mm inside from both ends including properly curing for 21 (twenty one) days and carriage of porcupine members from factory to the stack yard within a distance up to 20 Km	Each	6000		

	including loading, unloading& stacking complete as directed. (Including forest royalty and all taxes as admissible).				
20	Labour charge for launching of PSC Porcupine including carriage of PSC porcupine members of size 0.10 m × 0.10m × 3.00m from the stack yard to the place of launching ,erection of the Porcupine with 6 (six) members properly, supply & fitting/fixing with 12 mm dia 25 Cm long M.S. Nuts and bolts and launching the porcupine properly as directed. (Lead up to 150 m)				
	Launching without boat.	Each	120		
	Launching by boat:	Each	880		
21	**Provisional sum for additional ES outcomes** *(Bidders shall insert the rate/sum as mentioned in BDS 14.2)*	Job	1		
			Total = Rs.		
(Rupees_____)					

BOQ (LOT-2)					
Sl No	**ITEM OF WORKS**	**UNIT**	**QUANTITY**	**RATE**	**AMOUNT (in Rs.)**
1	Earthwork in bank trimming to the designed section/ slope including removing the soils at a minimum distance of 30m completed as directed.	Cum	173498.00		
2	Supply of Geo-textile bags of type-A (size 1.03X0.70M), inner dimension made of Geo-textile non-woven fabric sheets of 400 GSM manufactured from 100% virgin Polypropylene (PP) fibre having thickness not less than 3.00 mm with minimum properties as (i) Tensile strength (CD) ≥ 24 KN/m (ii) Tensile strength (MD) ≥ 22 KN/m (iii) Mass ≥ 400.00 Gm/m ^{2} (iv) CBR Puncture strength ≥ 4100 N/m2 (v) Elongation @ break (Warp) ≥ 54% (vi) Elongation @ break (Weft)≥ 52% (vii) Abrasion ≥ 70 % (viii) UV Resistance @ 500 hours ≥ 70% (ix) AOS ≤ 75 micron (x) Permittivity ≥ 1.25, (xi) Trapezoidal Tear Strength ≤ 520 N (xii) Permeability = 45Lt/m2/sec (xiii) Seam strength = 80 % of geotextiles strength . Stitching of Bags should be Ring Spun Yarn stitches with 2500-3000 denier double line chain stitch with overlap with stitches along the edge @ minimum 15 stitches per 100 mm.	Nos.	1343600		

	(Bags are to be supplied of 100 numbers or part in a bundle, properly packed with name of Manufacturer and Batch Number is to be marked on each bag with "WRD Govt of ASSAM" to be printed on each bag and mentioning properly the GSM and type of Geo bag polymer. Test Certificate from approved NABL accredited and ISO Certified Laboratory should invariably be submitted against each batch of material). FOR GUWAHATI					
3	Supply of Wire -netting box of size 1.50mx 1.50mx 0.45m made with mechanically woven, double twisted , hexagonal shaped wire mesh with wire made of low carbon, high ductile MS wire with heavy class of galvanization with an additional layer of PVC coating with mesh type of 10x12 as per EN 10223 & ASTM A975 , mesh wire of 2.70mm (I.D)/3.70mm(OD)tensile strength of 450-500/mm^2,edge wire/selvedge around it at least 2.5 times, lacing wire (zink P.V.C. coated) of 2.20mm (I.D.) /3.20mm (O.D) P.V.C. coating thickness of 0.50mm nominal, 0.38mm minimum and with average weight per unit being 12 kg with additional 3% of the weight of box for lacing wire supplied separately, supporting the facing of the box with Zink coated steel wire of required length as directed, complying with A.S.TM and European norms, including payment of all duties, sale tax, any other taxes as applicable loading, unloading and staking them at the site of work in measurable stacks, complete as directed .	Each	74200		

4	Supply of non-woven Geo-textile fabric sheets of 300 GSM manufactured from 100% virgin Polypropylene (PP) fibre with minimum properties as (i) Tensile strength ≥ 12 KN/m (ii) Mass ≥ 300.00 Gm/m ^{2} (iii) CBR Puncture strength ≥ 3.5 KN (iv) Elongation at break ≥ 60% (v) Abrasion ≥ 70 % (vi) UV Resistance @ 500 hours ≥ 70% (vii) AOS ≤ 75 micron (ix) Permittivity ≥ 1.25, (x) Trapezoidal Tear Strength ≤ 340 N (xi) Permeability = 2.00 x 10^{-3} m/sec (xii) Seam strength = 80 % of geotextiles strength . Stitching of Bags should be Ring Spun Yarn stitches with 2500-3000 denier double line chain stitch with overlap with stitches along the edge @ minimum 15 stitches per 100 mm. (Each Roll of Geo Fabric Sheet should be supplied in properly packed Bundles and should be marked with the Name of Manufacturer & Batch Number clearly on each bundle with "WRD Govt of ASSAM" to be printed on it and mentioning properly the GSM and type of polymer and Test Certificate from approved NABL accredited and ISO Certified Laboratory should invariably be submitted against each batch of material) FOR GUWAHATI	Sqm	126630.00			
5	Supply of Sewing Thread/Yarn PPMF Stitching Thread (2000 Den. Kaplon) i/c payment of taxes.	RM	14779600			

6	Carriage of Geo bags of size 1.03 x 0.70 m including loading & unloading, stacking etc . complete and including hire charge of truck with driver and handyman cost of P.O.L. etc complete as directed. (Distance from Guwahati to Sorbhog = 135Km.)	Bag/Km	1343600		
7	Carriage of 300gsm Geo-Sheet including loading & unloading, stacking cost of P.O.L. etc. complete and including hire charge of truck with driver and handyman complete as directed. (Distance from Guwahati to Sorbhog = 135Km.)	Sqm/Km	126630.00		
8	Filling and laying in cage with silt filled Geo bags of size 1.03m X 0.70m excluding excavation of specified silt from flood plain or adjacent chars within a distance of 90m of the work site, filling geo bags with silt having minimum weighing 126.00 Kg and minimum volume 0.084 cum after filling ,double locking chain stitching the mouth of the filled bags with polypropylene thread by power driven double needle machine, stacking the same in batches of 100, carrying the same to the dumping site including all handling charges and local carriage within a distance of 150m and laying properly. in cages made of wire netting sheets of size 2.57x1.66m of 8G galvanized wire making the cage from 2 nos. of wire netting sheet by tying the projected wires complete as directed. (Silt, Geo Bag, Wire Netting Sheets and Polypropylene thread will be supplied by the department free of cost).				
	a) Without Boat	Bag	127200		
	b) With boat	Bag	763200		

9	Filling and laying of Geo bags of size 1.03m X 0.70m excluding excavation of specified silt from flood plain or adjacent chars within a distance of 90m of the work site, filling geo bags with silt having minimum weighing 126.00 Kg and minimum volume 0.084 cum after filling ,double locking chain stitching the mouth of the filled bags with polypropylene thread by power driven double needle double stitched machine, stacking the same in batches of 100, carrying the same to the dumping site including all handling charges and local carriage within a distance of 150m and laying properly as directed. (Silt, Geo Bag and Polypropylene thread will be supplied by the department free of cost) a) without boat	Bag	453200			
10	Labour charge for laying Geo fabric sheet as filter below pitching including anchoring and complete as directed	Sqm	126630.00			
11	Collection and supply of River silt by truck carriage free from debris and other foreign material payment of forest royalty if any, etc. (For initial Lead beyond 1/2 Km and upto 4.00 km for all lifts.)	Cum	112862.40			
12	Earth work in excavation of drainage channel to the proper grade and slopes as required including disposing the excavated debris/soil to a safe distance of minimum 50 m distance as directed. Normal Soil.	m^3	7950.00			
13	Supply of Pre stressed Cement Concrete (PSC) Porcupine members of size 0.10m X 0.10mX 3.00m with M-30 grade of cement concrete conforming to IS 1343:2012 using super -plasticizer @ 1.2lit /bag of cement with graded broken course aggregate upto 20mm size down conforming to IS 10262:2009 & IS	Each	7920			

	456:2000 and reinforced with 4 Nos. of 4 mm dia high tensile steel wire cable with necessary cover and 4mm high tensile stirrups at 250mm C/C, in conformity with IS-6403:R2002 and stressed to required strength not exceeding 9.18 N/mm, holes of 16 mm dia at 50 cm inside from both ends in the same face and in either face of post another 2 Nos. of holes of size 16 mm dia at 65mm inside from both ends including properly curing for 21 (twenty one) days and carriage of porcupine members from factory to the stack yard within a distance up to 20 Km including loading, unloading& stacking complete as directed. (Including forest royalty and all taxes as admissible).				
14	Labour charge for launching of PSC Porcupine including carriage of PSC porcupine members of size 0.10m × 0.10m × 3.00m from the stack yard to the place of launching, erection of the Porcupine with 6 (six) members properly, supply & fitting/fixing with 12 mm dia 25 Cm long M.S. Nuts and bolts and launching the porcupine properly as directed. (Lead up to 150 m)				
	Launching without boat.	Each	360		
	Launching by boat:	Each	960		
15	**Provisional sum for additional ES outcomes** *(Bidders shall insert the rate/sum as mentioned in BDS 14.2)*	Job	1		
			Total = Rs.		
(Rupees_____)					

Note:

1. Item for which no rate or price has been entered, will not be paid for by the Employer when executed and shall be deemed covered by the rates for other items and prices in the Bill of Quantities. (Refer: ITB Clause 14.2 and GCC Clause 45.4).
2. Unit rates and prices shall be quoted by the bidder in Indian Rupees (refer: ITB Clause 14.1 and ITB Clause 15.1).
3. Provisional sum for each lot shall be filled-in online in the BOQ format using the values indicated in the BDS 14.2

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*

[Note: as and when some country/ countries become ineligible insert the list of such countries following approval by the Bank to apply the restriction]

Section VI - Fraud and Corruption

(Section VI 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, (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 mis procurement, 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;[13] (ii) to be a nominated14 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[15] 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.

[13] 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.

[14] 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.

[15] 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 2 – Works'Requirements & Drawings, Maps

Section VII-Works'Requirements& Drawings

1. General Project Information

This chapter provides a general description of the scope of work and technical specifications for the construction of anti-erosion works, construction of porcupine screens and embankment upgrading for 12 (twelve) locations along the Beki River in Assam under Component 2 of the Assam Integrated River Basin Management Project (AIRBMP).

The Civil Works considered under the AIRBMP aim at reducing flood and river erosion risks in the Assam parts of the Beki and Buridehing sub-basins by means of implementation of no-regret, priority river works. This Bid Document for Civil Works provides a description of the type and location of river work – with Technical Specifications - to be implemented for riverbank protection (anti-erosion works) and embankment upgrading of an existing embankment for locations along both banks of the Beki River. The works provisions have been given in details in the BoQ which are given in Chapter IV- Bidding forms.

1.1 Definitions

- "Riverbank Protection" is a layered system placed on a sloping or horizontal surface to guard against hydraulic forces and scouring.
- "Geo-textile" is a synthetic fabric (woven, non-woven, needle punched) applied as a filter or used in tailored geo-textile systems (bags, containers, mattresses, etc.)
- "Flood season" is defined in this Bid Documents as period between May to September, characterized by high water levels and strong currents, accompanied by fast morphological changes.
- "Top Soil" is the top layer of soil containing a higher proportion of organic material.
- "Suitable material" comprises all material obtained from excavation within the site or from borrow pits which is approved by Engineer accepted for use in the work.
- "Unsuitable material" is any material other than suitable material and will comprise high organic content; peat, stamp, clay of liquid limit exceeding 90%, or plasticity index exceeding 65%, twigs, worn out porcupines, etc. and or any other material the Engineer considers "unsuitable material" for execution of works under the package.
- "Soft" material will mean all material, whether suitable or unsuitable, other than that defined as rock.
- "Subsoil" is naturally deposited or filled and compacted soil material on which an embankment or a riverbank protection is constructed.

- "Porcupine" is a prismatic type permeable structure, comprises of six members of made of Reinforced Cement Concrete (RCC)/ Pre- Stressed Concrete (PSC), which are joined with the help of iron nuts and bolts. These structures are used as permeable screens which are used to dampening of the velocity to induce siltation from silt laden flow and to deposit the silt along the affected area so as to shift the flow away from the protected reach.

- "Controlled Dumping" is defined as the accurate under-water placing of Geo-bags or loose quarried stones below working low water levels. Controlled Dumping involves a dumping barge/ pontoon held in place by anchors in the river and "dead-man" on the shore by the help of double drum mooring winches and positioned during the dumping operation using a Total Station or RTK-GPS.

- "Lowest Low Water" is the lowest recorded water level for the period of record. This level is used for design purposes and to delineate land and underwater construction activities. Below this level, wave erosion is not a design consideration, and Geo-bags are not prone to ultra-violet degeneration.

- "Launching apron" is a concentrated mass of material placed on a sloping or horizontal surface under water the elements of which are designed to launch down to greater depth once the riverbank/bed beyond the apron starts scouring and deepening.

- "Dumping barge/pontoon" is a floating equipment temporarily placed for the purpose of dumping Geo- bags from known locations controlled through Total Station or RTK-GPS positioning, held in place by the help of anchors and positioned by the help of double-drum mooring winches.

- "Power driven flat top country boat" is floating equipment with the capacity to carry a weight e.g., number of Geo-bags or crates as per Contractor's work methodology, to the dumping barge/ pontoon and subsequent dumping.

- "Engineer" is the competent person appointed by the Employer (Water Resources Department) and notified to the Contractor, who is responsible for supervising the execution of the Works and administering the Contract.

- "Embankment" is defined as a thick wall of earth or gravel that is built to prevent water from a river from flooding the area. It might also carry a road on the crest or the top of the wall.

1.2 Background

Assam with its vast network of rivers is prone to natural disasters like flood and erosion which has a negative impact on overall development of the state. The flood prone area of the country as a whole stand at about 10.2 % of the total area of the country, whereas flood prone area of Assam is 39.58 % of the area of the state. It signifies that the flood prone area of Assam is four times the national benchmark of the flood prone area of the country.

Another major problem being faced by the state of Assam is bank erosion by the river Brahmaputra, Barak and its tributaries. Damages caused due to erosion runs into several hundred crores every year. The loss of

life and livelihood that results from flood and erosion is also very large. As assessed, the annual average loss of land is nearly 8000 Ha. The Government of Assam has been trying hard to mitigate flood and erosion problem by putting in place a number of flood control, drainage and anti-erosion measures.

Given the scale of devastation which the rivers bring upon the region and the people, it is important to design a program which is transformative in character and provides a broad framework for flood and erosion management in Assam. Various initiatives are underway through internally funded government programs as well as with international partners to address these issues.

The State Govt. of Assam (SGoA) represented by the Flood and River Erosion Management Authority for Assam (FREMAA), the Water Resources Department (WRD) and Assam State Disaster Management Authority (ASDMA) had formulated a comprehensive, integrated project called "Assam Integrated River Basin Management Project (AIRBMP) focusing on the tributaries of Brahmaputra and Barak river within Assam. The project is aimed at developing a holistic approach for mitigating flood and erosion problem in Assam with financial and technical support from the World Bank.

The Assam Integrated River Basin Management Program (AIRBMP) is designed as a twelve-year set of activities with an overall World Bank financing envelope of US$500 million. The overall program development objective is to reduce water-related disaster risks in Assam and sustainably develop its water resources. The program aims to squarely address the "Water-DRM Nexus" through a set of synergistic activities including the use of nature-based solutions and non-structural approaches.

The development objectives of Phase 1 are to: i) reduce flood and river erosion risks in the Assam parts of the Beki and Buridehing sub-basins; ii) enhance the resilience of local communities to flood and river erosion in selected locations; and iii) prepare integrated water resource management plans in the Beki, Buridehing, and Jiadhal sub-basins to support future investments in subsequent program phases

The 1st phase of AIRBMP focusses on three tributaries of the Brahmaputra River, namely the Beki, Buridehing and Jiadhal Rivers. Other tributaries of the Brahmaputra and Barak rivers will be dealt with in subsequent Phases of AIRBMP and concern the Gai, Jiabharali & Bhogdoi sub-basins of the Brahmaputra River, and Jatinga & Singla tributaries of the Barak River.The AIRBMP have 4(four) main project components namely:

- Component 1: Institutional Strengthening and Strategic Studies ($15 M). Subcomponents include: i) activities to help WRD make the transition from a department focused primarily on structural flood control solutions, to an integrated water resources management department that helps Assam sustainably manage its abundant water resources including transboundary collaboration with Bhutan and Bangladesh; ii) strategic studies to help ASDMA address knowledge gaps and guides its policies and programs related to flood and river erosion risk management; and iii) overall project support and technical assistance, including FREMAA's incremental operating costs.

- Component 2: Integrated Water and Flood/River Erosion Risk Management-WRD ($83 M): This component will finance the structural and non-structural activities to reduce flood and river erosion risks and establish a foundation of integrated water resources management in selected sub-basins. Subcomponents include: i) no-regret investments in Beki and Buridehing sub-basins; ii) integrated water resource management plans in the Beki, Buridehing, and Jiadhal basins; iii) flood forecasting

in the Beki, Buridehing, and Jiadhal sub-basins; iv) collection of hydrological information and Embankment asset management and safety; and v) WRD incremental operating costs.

- Component 3: Integrated Flood/River Erosion Risk Management-ASDMA ($22 M). Sub-components include: i) investments in approximately 100 climate resilient villages; ii) flood shelters in approximately 40 locations; iii) strengthening decentralized disaster management capacities through circle level quick response teams; iv) improving early warning and dissemination systems; and v) ASDMA's incremental operating costs.

- Component 4: Contingent Emergency Response ($ 0). This allows an immediate response to an Eligible Crisis or Emergency, as needed, from other project components to partially cover emergency response and recovery costs. This component could also be used to channel additional funds should they become available because of the Emergency.

The Civil Works for 12 (Twelve) locations for Beki River under Phase 1 of AIRBMP are distributed over 2 (two) individual contracts (also known as "Lots") (see Table 1 below). Qualified Contractors may bid to one or both lots. To provide more specific information to the bidder, the lot/contract wise details regarding scope of works under the Lot/Contract and objectives of these river works and embankment upgrading with technical drawings, maps etc. are being provided below.

1.3 Beki River & river works

The Beki River is one of the right bank tributaries of the Brahmaputra River which originates in Bhutan. The River Beki originates from the Mountain Reserve Forest at Mathanguri and joins the Beki River (or Manas when referring to the west branch of the Beki River). The Beki River drains an area of about 26,243 Sq.km in Barpeta district. Manas National Park, Barpeta Road &Howly are the important sites/villages/transportation corridors situated in the influence zone of the river.

Figure 1 & Figure 2 below show the Beki River catchment covering parts of Bhutan and Assam, and a detailed map of the Beki River in Assam.

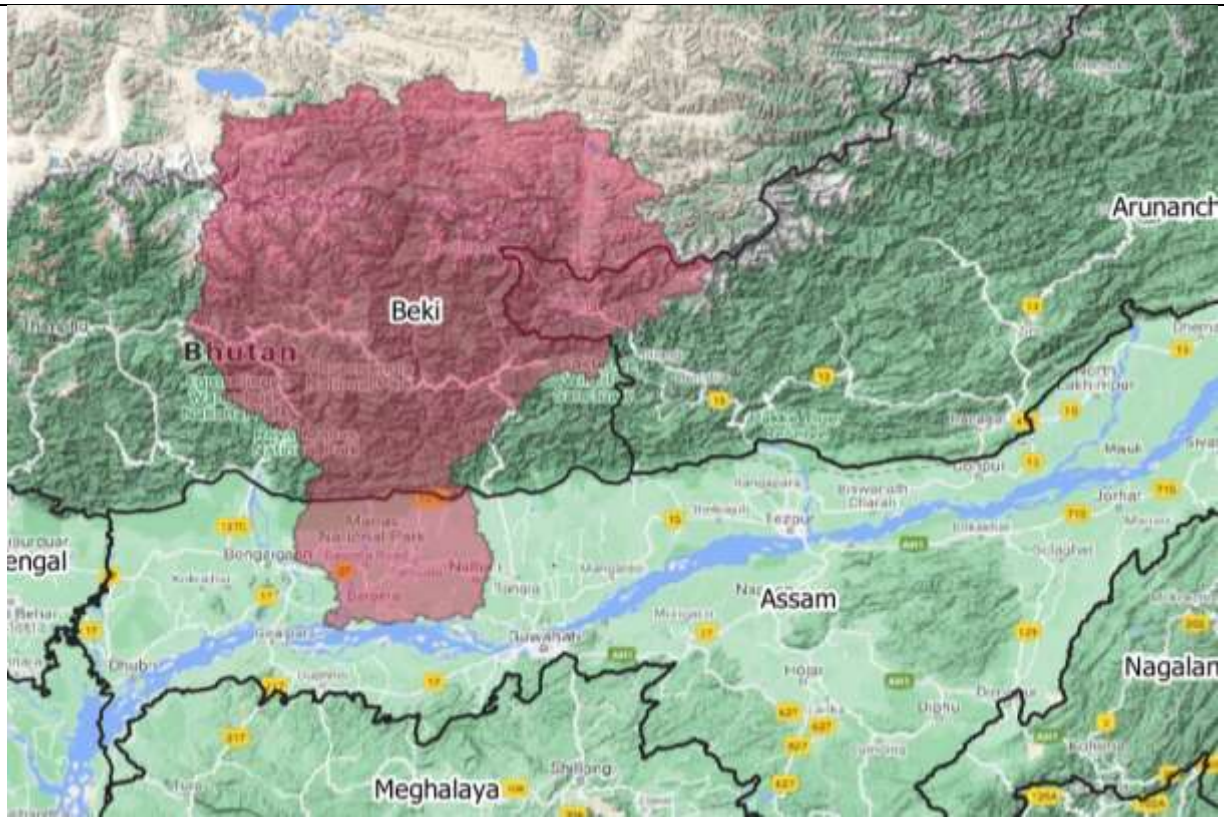

Figure 1: Beki River catchment

Figure 2 River Beki from the border with Bhutan till its confluence with the Brahmaputra River in Assam State

1.4 Flood Protection and riverbank erosion

Due to the dynamic behavior of the Beki River, active river erosion causes annual continuous shifting of the river towards the left bank and thereby eroding a greater area year by year. River erosion threatens villages along the banks of the Beki River, putting schools, religious buildings and the existing embankment at risk of being eroded by the river if no further improvements to protect the riverbanks from river erosion are undertaken very soon. After completion of the civil works, adjoining villages like Elengbari, Chubari, Khagrabari, Safakamar, Katajar etc will be benefitting and schools, institutions, cultivable land etc. will be safe from the erosion problem.

Considering the present situations, WRD is in the opinion that there is an urgent need for protecting the most vulnerable riverbanks, especially those that directly protect adjacent embankments and other critical infrastructure (bridges, quay walls in cities, river ports, pipelines, important buildings etc).

The AIRMP provides WRD the opportunity to strengthen the riverbanks for most critical stretches along the Beki River. This chapter provides the technical specifications of the Civil Works for selected locations.

1.5 Project location and works description

The locations of works sites under the AIRBMP Phase 1, which are included in this bid document comprises of flood and erosion affected areas situated on both bank of the river.

For the Beki River, the locations of the work sites are located in the District of Barpeta and Baksa District. The details of the location are given in Table 1. The locations are provided in the maps which are appended in the chapter Drawings and provided as high-resolution file to interested Bidders.

The scope of work under this Bidding Document "Construction and upgrading of river works along the Beki River to reduce river erosion risks" are as given below:
Note the letters in the Location ID correspond to:

- AE- *Anti Erosion & Porcupine Works,*
- PR- *Porcupine Works* and
- *RS- Embankment Upgrading*

Table 1: description of river works for Beki River specified by location, with information on the type of works, location and reach length

Lots/Contracts	Location (ID)	GPS locations of the starting points of the river works		Reach Length (m)
		Latitude	Longitude	
1	Elengbari (AE-2)	26°38`26.59"N	90º59'13.23"E	1600
	Chunbari (AE-3)	26°37`13.88"N	90º59'9.53"E	1500
	Chunbari (PR-2)	26°38`46.27"N	90º59'20.05"E	450
	Safakamar (AE-9)	26°32`59.88"N	90º58'29.13"E	750

	Katajhar (AE-10)	26°32'43.56"N	90º58'14.22"E	1870
	CH.-2780m to 6780m L/B (R/S-1)	26º20'7.80"N	90º55'2.46"E	4000
2	Dumunighat (AE-11)	26º32'18.77"N	90º57'22.93"E	1300
	Nichuka (AE-12)	26º31'11.40"N	90º55'51.70"E	1450
	Salsalia (AE-17)	26º26'8.00"N	90º54'5.57"E	900
	Bordenga (AE-18)	26º25'3.12"N	90º53'46.09"E	1300
	Guileza (AE-19)	26º24'16.75"N	90º54'37.44"E	1000
	Mowamari (AE-20)	26º23'48.61"N	90º54'21.56"E	500
	Sawpur (AE-24)	26º20'12.54"N	90º52'47.45"E	1500
	Choudhury Bazar (PR-12)	26º20'7.80"N	90º55'2.46"E	730

However, to have more specific information to the bidder, the lot/contract wise details regarding scope of works under the Lot/Contract and objectives of these river works with technical drawings, maps etc. are being provided below. The Civil Works for 12 (Twelve) locations along the Beki River under Phase 1 of AIRMP are distributed over 2 (two) individual contracts (also known as "Lots") (see Table 1 above). Qualified Contractors may bid to one or multiple lots.

1.6 Description of Civil Works

Anti-Erosion works (AE) To protect the riverbank from further erosion, so-called anti-erosion works will be installed as riverbank protection. The riverbank protection work will be comprised of the controlled placing of crates filled with geobags and dumping of Geo-bags below Lowest Low Water as apron and placement of CC Blocks above Lowest Low Water on the trimmed slope, placed over the geotextile filter media as revetment. In the transition zone between the revetement and the falling apron, at LWL, a toe key will be constructed with wire-netting boxes filled with geobags as per specification and drawings. This protection extends below Lowest Low Water and forms a transitional berm towards the underwater slope protection. Concrete porcupine screens/bars will be placed at the upstream and downstream of the site.

Porcupine bar field (PR): have been a proven measure to increase siltation and reduce erosion at targeted locations along the river. These pro-siltation structure made with 5(five) porcupine bar field are constructed in form of screens at suitable locations and are used to induce situation by reducing the flow velocity of the channel. They are provided as supplementary structure to minimize the erosion affected location by diverting the main channel from the affected areas by stabilizing condition along the bank with induced siltation provision of PSC porcupine bar for pro-siltation work at Chunbari.

Embankment Upgrading (R/S):
The current Embankment between boundary of Manas National Park and Chunbari has been constructed in the year 1973 and has not maintained ever since. Due to soil compaction, the current crest level does no longer meet the original design standard of the Embankment and hence heightening is needed to fulfill the

safety standards for this Embankment. The Embankment will be further strengthened as per modern design standards, often requiring widening of the Embankment to enable changing from a 1:2 slope to a 1:3 slope. The design of the embankment is approved by CWC and the cross-section drawing are prepared accordingly. For Earth work the cross sectional drawing s are provided at 100M interval and for anti-erosion work typical cross section are provided. The details of the cross-sectional drawings, free board required against Design Highest Flood Level (DHFL), design parameter and design specifications are available in the DPR of Beki project which has been uploaded in the websites of FREMAA, Assam i.e., http://fremaa.assam.gov.in and the website of WRD, Assam i.e., http://waterresources.assam.gov.in.

Error! Reference source not found. Figure 3 (Typical cross-section for the anti-erosion works), Figure 4 (*Typical cross-section of a PSC Porcupine Screens*) and Figure 5 (Typical Cross-Section for embankment upgrading) show a typical cross-section of the proposed river works. The Detailed Project Report (DPR) with maps and drawings will be available at the Project websites of FREMAA, Assam i.e., http://fremaa.assam.gov.in and the website of WRD, Assam i.e., http://waterresources.assam.gov.in

The DPR provides supporting information for the design of all river works for the Beki sub-basin of the Brahmaputra River, of which only a selection of river works is described under this Bidding Document for Civil Works. Other locations may be implemented under Phase 2 of AIRBMP or picked up by WRD at a later stage.

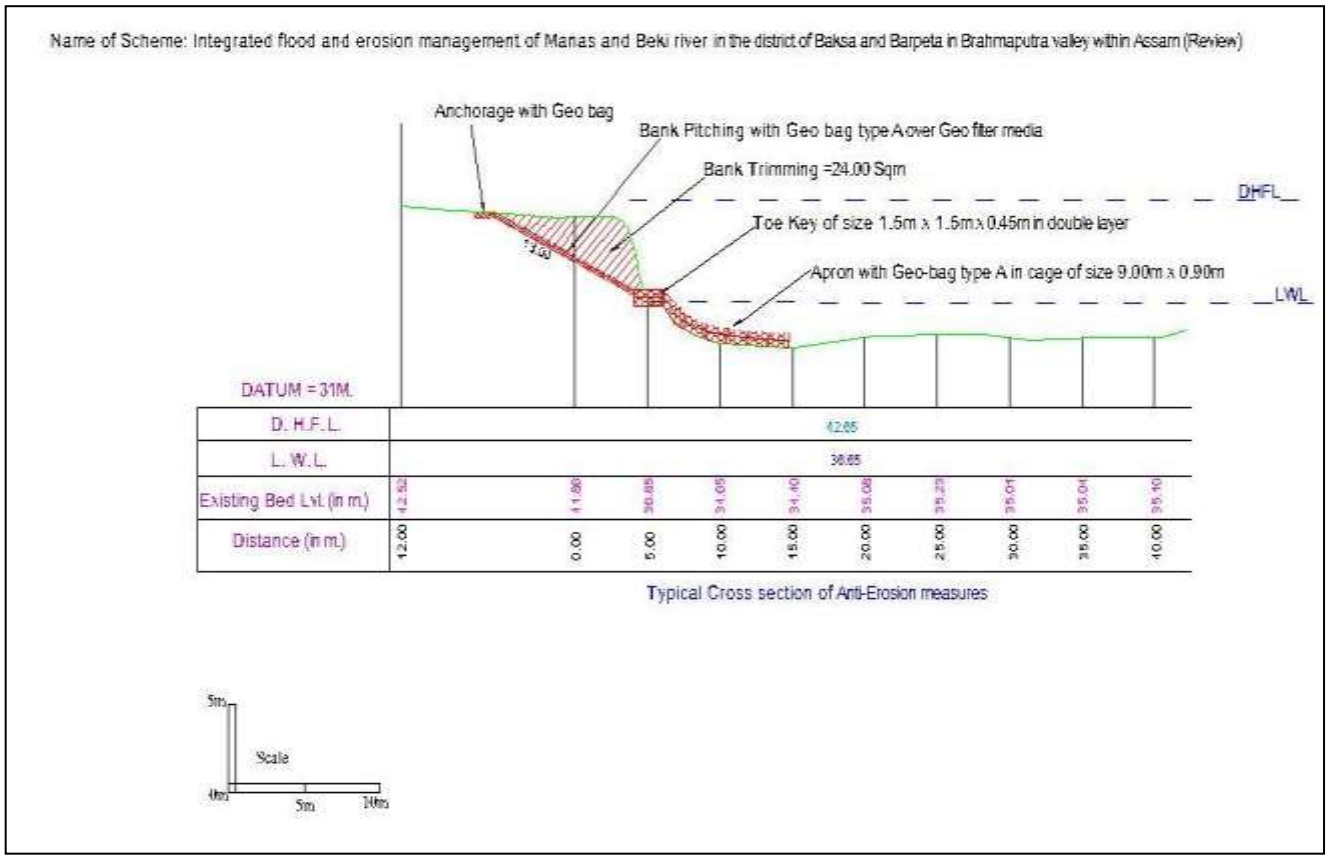

Figure 3 Typical cross-section for the anti-erosion works under this Bidding Document

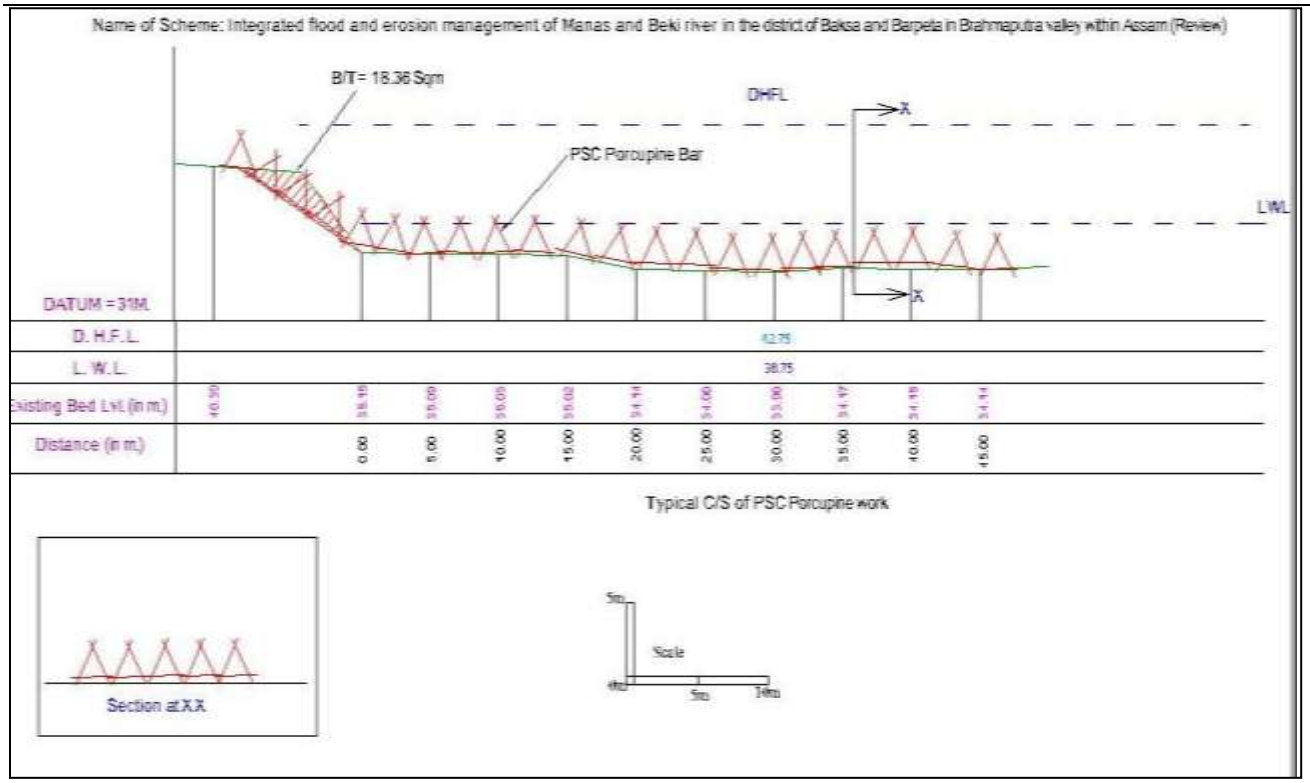

Figure 4: Typical cross-section of a PSC Porcupine Screens under this Bidding Document

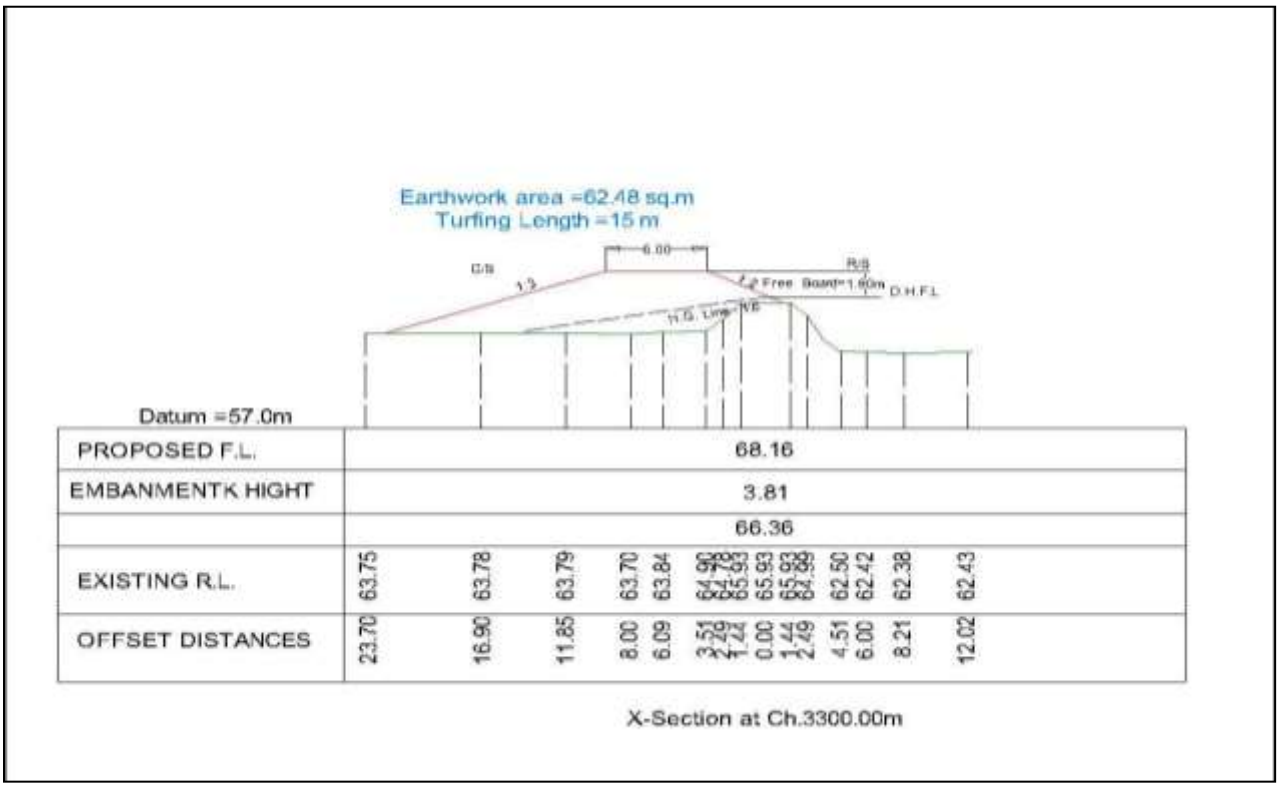

Figure 5 Typical Cross-Section for embankment upgrading

The Civil Works will have to be implemented as per schedule and methodology submitted by Contractor and approval of same by the Site Engineer of WRD.

1.7 Lot -1 of civil works for Beki River under Phase-I of AIRBMP

Brief description of the locations:

Locations included in this Lot-1 comprises of:

- Anti-erosion works for stretches of the river at Elengbari (AE-2), Chunbari (AE-3), Safakamar (AE-9) and Katajar (AE-10) which are located along the left bank of Beki River. The proposed civil works aim at protecting the nearby located major PWD road, connecting Barpeta Road to Manas National Park as well as riparian villages located along the river (protecting schools, religious buildings, houses and cultivable land).
- Porcupine bar field at Chunbari (PR-2), pro-siltation measures will be installed, through construction of porcupine bars.
- Upgrading (raising and strengthening) of 4 km of the existing embankment between Chunbari and Manas National Park (between chainage 2780m to 6780m) (RS-1). Figure 9 shows the current condition of the embankment at Chunbari

All the above locations fall under Barpeta District of Sorbhog LAC. Table 1 provide the coordinates of the locations where the works will have to be executed. Figure 6 shows a map with works locations, adjoining areas, roads etc. of Lot 1 river works and Figure 7& Figure 8 show photographs of bank erosion at selected locations under Lot-1.

Figure 3 (anti-erosion), Figure 4 (porcupines) and Figure 5 (embankment upgrading) show the cross-section drawing for typical cross-section of the proposed river works for this lot.

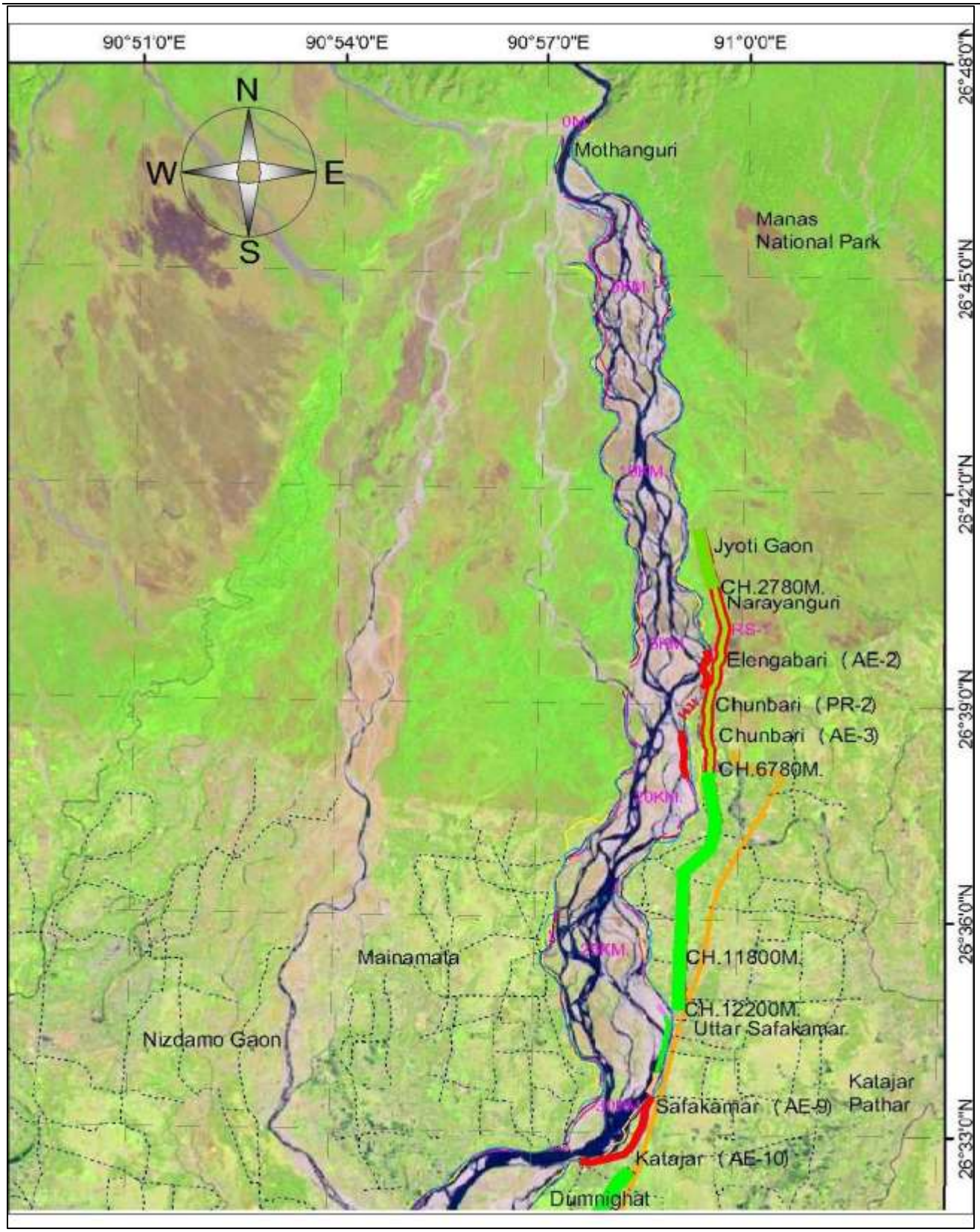

Figure 6 locations of Lot-1 river works

Figure 7 Erosion at Elengbari

Figure 8 Erosion at Katajar

Figure 9 Existing condition of the Embankment at Chunbari (Lot-1)

1.8 Lot -2 of civil works for Beki River under Phase-I of AIRMP

Brief description of the locations:

Locations included in this Lot-1 comprises of:

- Anti-erosion works (AE) for stretches of the river at Dumunighat (AE-11) and Nisuka (AE-12) which are located along the left bank of Beki River and Salsalia (AE-17), Bordonga (AE-18), Guileza (AE-19), Muwamari (AE-20) and Sawpur (AE-24), located along the right bank of the Beki River. The proposed locations for Dumunighat and Nisuka are to protect critical infrastructure such as the major Assam Public Works Department (APWD) road from Barpeta Road to Manas National Park and the railway bridge. All the above locations fall under Barpeta District of Sorbhog and Jania Legislative Assembly Constituency.
- Porcupine field (PR): At Choudhury Bazar (PR-12), pro-siltation porcupine bars will be constructed.

At Salsalia, Bordonga, Guileza, Muwamari and Sawpur the river shifted towards right bank eroding huge cultivable and homestead land. Anti-erosion measures are expected to provide great benefits to these villages as well as critical infrastructure connecting Kalgachia and Sorbhog towns with main roads.

A location map enclosed below for reference of project location, adjoining areas, roads etc.

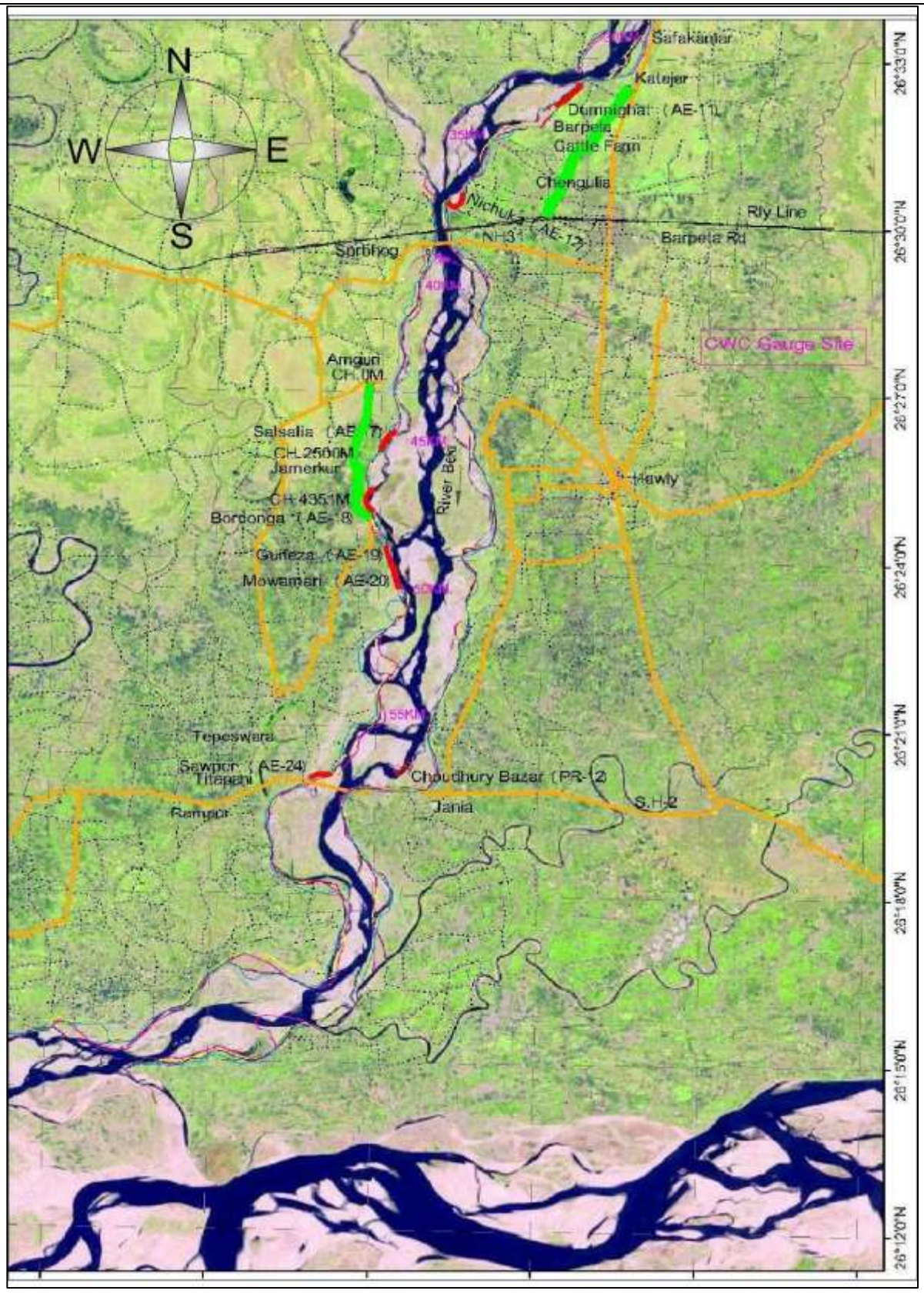

Figure 10 Map with locations of Lot-2 river works

The photographs presented below show the present status of the erosion at selected reaches which are proposed for implementation of river works

Figure 11 Erosion at Salsalia

Figure 12 Erosion at Guileza

Technical Specifications

Table of Contents

2. General Description

2.1 General

2.1.1 Description

Specification for works to executed under this package will follow the general specification of Water Resources Department (WRD) and Assam Public Work Department (APWD) in general. For upgrading of the embankment with earthwork, the relevant specification of MORTH- "SPECIFICATION FOR ROADS AND BRIDGE" (14th Edition, Ministry of Road Transport and Highways), India are applicable as well as the specifications adopted by the APWD. The MoRTH specification are available on line and the specifications related to works of APWD and WRD can be procure from the respective Chief engineers' office. However, the river work with bank protection works will be implemented as per general specification and design of Water Resources Department, Assam. Any details related to specifications, cross sectional drawings, maps related to Beki project are uploaded in the websites of FREMAA, Assam i.e., http://fremaa.assam.gov.in and the website of WRD, Assam i.e., http://waterresources.assam.gov.in. for ready reference of the contractor.

Morphological instability of the rivers does not allow for a final detailed design many months ahead of the work. The design presented in the package is a generic averaged design based on latest surveys at the time of design(2021). It shows the work to be implemented and helps the Contractor establishing his work methodology. A more detailed and accurate design will be prepared by the Contractor based on a baseline survey conducted by the contractor and checked by the Engineer in charge (WRD) at the beginning of the execution of the construction contract. The pre-work survey is to be conducted by the contractor after receipt of the work order and shall be completed maximum three days prior to dumping of geobags. The pre-work survey will identify design river conditions to be used when preparing the implementation design, section by section, just prior to construction. The updated implementation design form part of the contract between Employer (WRD) and Contractor

All works will be paid based on the counted number of placed cc block crates and dumped geo-bags. These counted numbers will be cross-verified using various other processes including consecutive river surveys immediately prior to and after placing/dumping and reflected in the as-built drawings, systematic diving investigations (Figure 16), and video recordings during all dumping operations. The as-built drawings will be based on a pre-work survey conducted two or three days before the actual construction activity, and a post-work survey conducted two or three days after the actual construction activity plus the recording of dumping lines in the plan by the contractor (Figure 13 & Figure 14).

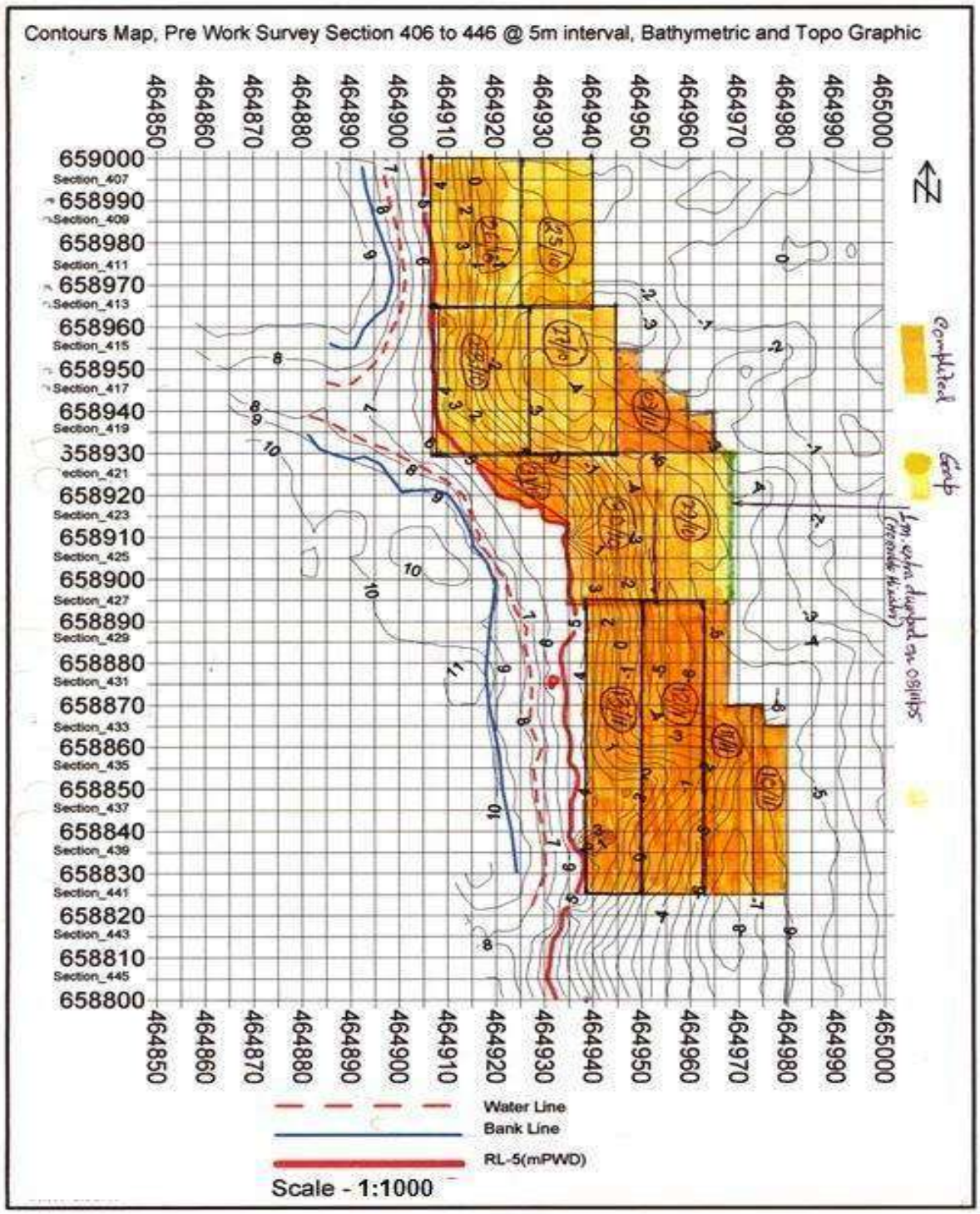

Figure 13: Example of implementation design to be submitted by the contractor

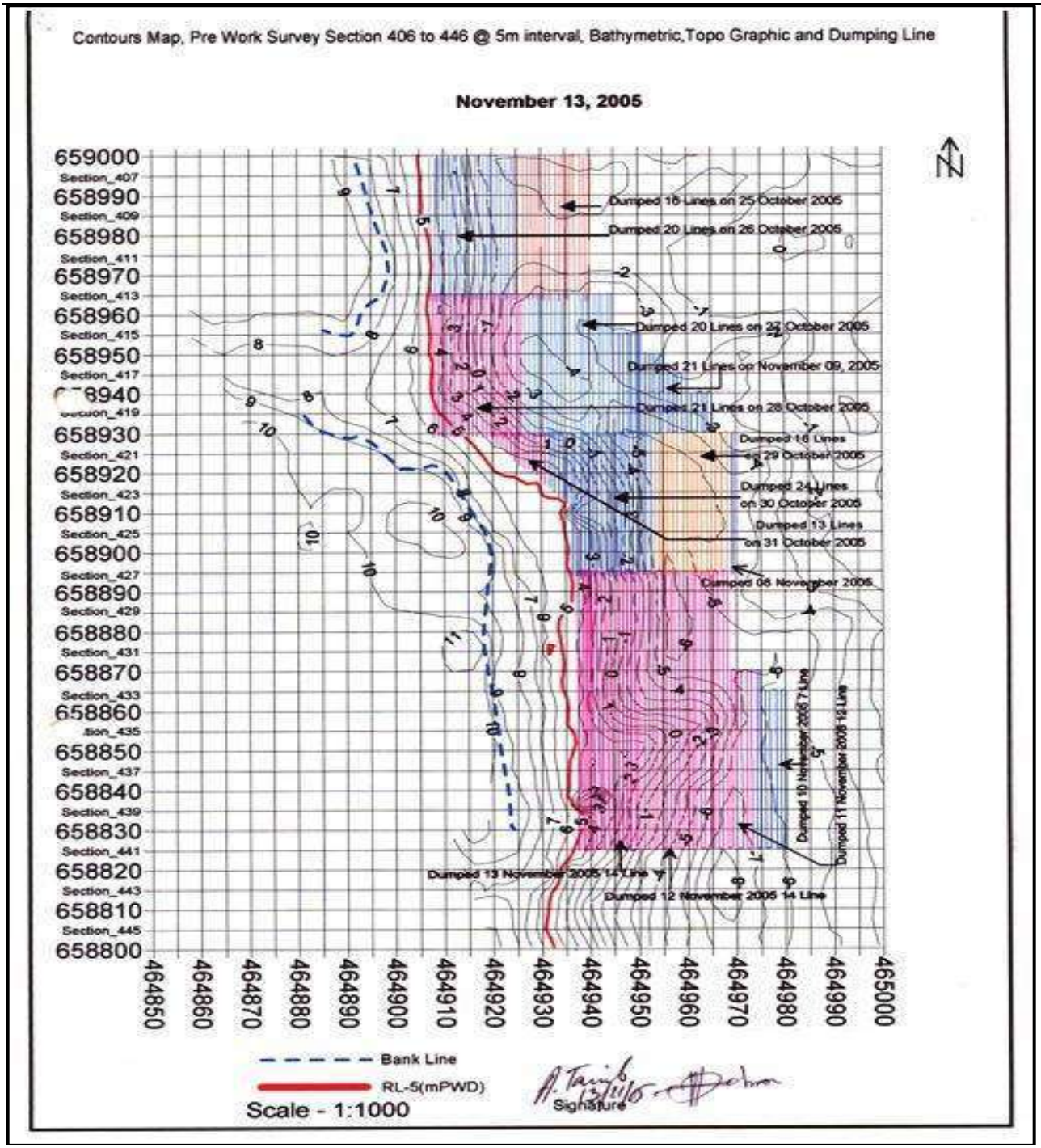

Figure 14: Example recorded and certified dumping record in plan

PIRDP, Contract Package No, P-3/ 2005
Dumping Barge Position List

13 November 2005

U/S (River Side)			D/S (River Side)			Time	Loads 2A+6B	Spacing	Remarks
Date	Northing	Easting	S.L	Northing	Easting				
13/11/2005	658894.954	464949.262	1	658824.984	464949.297	9:15 AM	70	0.9 m	
13/11/2005	658895.094	464948.412	2	658824.895	464948.268	9:30 AM	70	0.9 m	
13/11/2005	658895.127	464947.464	3	658824.974	464947.525	9:40 AM	70	0.9 m	
13/11/2005	658895.110	464946.592	4	658825.149	464946.579	9:50 AM	70	0.9 m	
13/11/2005	658895.115	464945.768	5	658825.186	464945.798	10:01 AM	70	0.9 m	
13/11/2005	658895.166	464944.833	6	658825.142	464944.887	10:12 AM	70	0.9 m	
13/11/2005	658895.173	464943.824	7	658824.913	464943.881	11:10 AM	70	0.9 m	
13/11/2005	658894.813	464942.857	8	658824.919	464942.737	11:24 AM	70	0.9 m	
13/11/2005	658894.821	464942.164	9	658825.152	464942.141	12:20 PM	70	0.9 m	
13/11/2005	658894.888	464941.132	10	658824.930	464941.135	12:40 PM	70	0.9 m	
13/11/2005	658895.125	464940.147	11	658824.855	464940.268	1:10 PM	70	0.9 m	
13/11/2005	658895.182	464939.371	12	658824.897	464939.265	1:28 PM	70	0.9 m	
13/11/2005	658895.132	464938.515	13	658825.014	464938.555	3:20 PM	70	0.9 m	
13/11/2005	658895.139	464937.641	14	658824.858	464937.649	3:35 PM	70	0.9 m	

Total for Position # 04 (Part) on November 13, 2005

Up to 12-11-2005 Dumping Bags A =	13200
Up to 12-11-2005 Dumping Bags B =	39600

Total Bags A =	1960
Total Bags B =	5880

Cumulative Total	
Type A =	15160
Type B =	45480

Surveyor Contractor Consultant B W D B SMO Staff

Figure 15: Example of certified dumping record per dumping line.

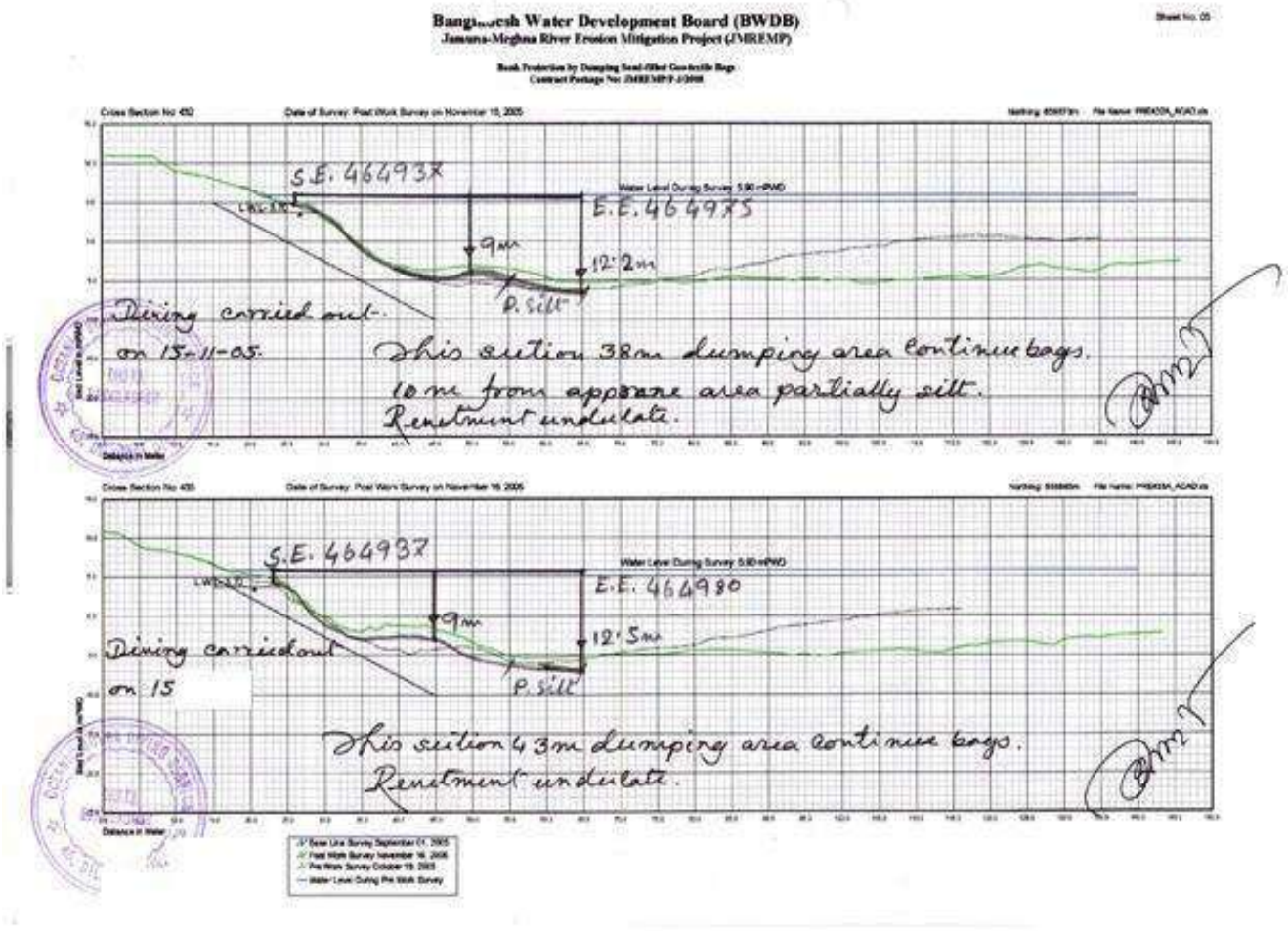

Figure 16: Example of certified diving investigation document registering recorded dumpings

2.2 General work requirement

1. The work is outlined in cross sectional typical drawings given as Figure 3,4 &5, included in this section including technical specifications, while items of work and preliminary estimated quantities are detailed in the Section IV, Bill of Quantities.

2. The detailed implementation design, based on the pre-work surveys, will describe the exact requirement of construction materials. The Contractor's overall work methodology and the items of work will not be influenced by these modifications, excepting for the actual quantity of CC block crates and Geo-bags dumped per cross-section.

3. The proposed riverbank protection is to be executed to guard against erosive action from river flow and scouring attack. The riverbank protection work will be comprised of the controlled placing of crates filled with geobags and dumping of Geo-bags below Lowest Low Water as apron and placement of geobags in revetment above Lowest Low Water on the trimmed slope

over the geotextile filter media as revetment. In the transition zone of apron and revetement, at LWL Toe key will be constructed with Wire -netting box filled geobags as per specification and drawings This protection extends below Lowest Low Water and forms a transitional berm towards the underwater slope protection. For supplementing the anti-erosion works, the construction of porcupine screens are also proposed to reduce the erosive force of the river flow and also to induce siltation along the affected reaches as reducing flow will activates silt deposition and divert the main channel away from the affected reaches.

Refer to the drawings cross sectional typical drawings given as Figure 3,4 &5, included in this section including technical specifications, while items of work and preliminary estimated quantities are detailed in the Section IV, Bill of Quantities) for design details.

4. The Contractor will prepare a construction methodology taking into account these Technical Specifications, the Completion Schedule, and the Drawings, and quote for the work as per his construction methodology by incorporating his rates and the total amount into the Bill of Quantities.

5. The method statement (construction methodology) will clearly state how the Contractor intends to do the work following stipulations of Clause 1.10 of this Section.

6. The works shown in the cross-sectional typical drawings given as Figure 3,4 &5will be implemented over 24 (twenty-four) months. During the construction of apron, systematic geo bag dumping to be executed as per required thickness and layers. Monthly bathymetric surveys of the entire reach will be performed by the contractor to determine whether additional scour has occurred and additional protection works are required.

7. The Contractor will submit a work plan in bar chart form to the Site Engineer of WRD within 7 (seven) days of Contract Signing. The work plan must be approved by the Site Engineer of WRD.

2.3 Hydraulic parameters

2.3.1 Water Levels

1. The Water Level (WL) for the Buridehing considered for respective sites are as per the WLs given in the x-sectional drawings given under chapters Drawings under Chapter II-Works requirement and drawings.

2. Please refer to cross sectional typical drawings given as Figure 3,4 &5 in this section. Current design based on the Lowest Water Level at the site is 38.65 m as given in figure-3 which is a typical cross section. However, LWL will be subjected to change based on the site condition during commencement of construction – to be surveyed by the contractor and certified by the Engineer in charge of WRD.

2.3.2 Flow Velocities

1. **For the Beki Project:** The flood season velocities recorded for the Buridehing projects are based on measurement in April 2021, ranges between 1.5m/s to 2.9m/s. However, the contractor would record and monitor the flow velocity of the channel during the execution of the work

2. There is no tidal influence. The flow angle and velocity often vary and is not uniform over time. Velocities of this magnitude can sometimes affect the efficient movement of transporting water craft. It can be expected that flow velocities during the dry season are less.

2.4 Site Conditions

a) It is the Contractor's sole duty to get familiar with the site conditions and take these conditions into account when preparing his work methodology. Underestimation of any site condition does not qualify for any claim.

2.5 Environment

a) The Contractor will protect the environment following principles of the Environmental Management Plan as per the Section IX (Appendix 1,2,3,4,5) which are provided as appendices to the Environment and social Management Plan provided in page no 287 to 300)

b) The Contractor will submit with his tender a written statement assuring compliance with all clauses as per Section IX, Environmental Management Plan.

2.6 Contractors' Method Statement

2.6.1 Contractors are required to (i) identify their main construction equipment, (ii) prepare a practical work methodology, and (iii) price all works taking local conditions and particularities into account.

2.6.2 Using familiarity with local site conditions, and information contained in the Technical Specification and Design drawings (no.2-12) in this Section, the Contractor will prepare main implementation scenarios and work methodology.

2.6.3 The Contractor will select a site suitable for the work and complying with regulations outlined in the Technical Specifications, obtain all necessary clearances from owners, make all necessary arrangements related to temporary possession of the land, prepare it for the purpose of the works, and subsequently restore and hand back the land to the owners on completion of works.

2.6.4 The Contractor will indicate alternative work areas for implementation of the main river work in case the main work area becomes flooded or eroded. The relocation of his work area will not qualify the Contractor for claims.

2.6.5 The Contractor will explain the proposed method for completion of the Works with due regard to water levels, availability of workspace, intended equipment, workforce and time required, etc. The detailed Method Statement will consist of minimum 10 pages or more of descriptive text and calculations with details of management and supervision, proposed work force, equipment and time requirements for the various work activities, methods to comply with safety requirements

and environmental management, etc., and will include as a minimum, the following aspects of the work:

a. Site and Installations
   - **i.** Location and size of work area
   - **ii.** Location and size of offices, labour sheds, and stores
   - iii. Levels of the work area with respect to the river water levels

b. Planning
   - **i.** Detailed bar charts clearly showing each key activity and their interdependencies. The format will be a bar chart showing the breakdown of the work on a weekly basis and the resource distribution to each work item. The schedule of work submitted by the contractor will clearly reflect the non-working periods during flood seasons and comprise the program for multiple-year work including procurement items, such as cc block, sand, wire-mesh, etc.

c. Main Equipment
   - **i.** Type and characteristic of main equipment, including drawings or photographs, especially dumping barge, anchors, mooring winches, excavators, trippers.
   - **ii.** Number and capacity of main equipment, and expected downtimes.
   - **iii.** Age and present status of equipment.
   - **iv.** Location and provider, from where obtained
   - **v.** Alternative sources for each proposed main equipment in case of non-availability or breakdown

d. Geo-bags filling
   - **i.** Detailed description of how the geo-bags will be filled including the type and numbers of mechanical filling devices, if any
   - **ii.** Type, source and quantity of sand used for filling the bags and quality testing procedures
   - **iii.** Type, source and quantity of sewing machines, and power sources and sewing capacity
   - **iv.** Anticipated daily production rate (number of closed bag per machine per day)

e. Transport of Geo-bags
   - **i.** The power driven flat top barge/ large machine driven boats to be used, including their dimensions and capacities (the height and draft of the barge must allow easy loading and unloading of Geo-bags, Crates filled with geobags)
   - **ii.** All boat propulsion devices and their capacity (horsepower), and the lifting device for anchors
   - **iii.** The loading, carriage and unloading cycle, including the manpower requirement, system to mix bags as per requirements, storage pattern to ensure stability of the pontoon, and estimated time per loading cycle.

f. Dumping of Geo-bags
   - **i.** Description of method for placing and positioning the barge/boat/pontoon or dumping aid System

ii. Details of positioning system and data storage, including type of equipment (e.g. Total Station) and expected survey tolerances

iii. Dumping methodology including the average daily capacity for the relevant placement methods. This should include the proposed number of labour, the time to dump the required number of bags or volume of crates, the time to move empty barge/boat/pontoon back for loading, loading time, and time for movement to dumping barge/boat/pontoon for next cycle. Any additional equipment required for dumping geobags, such as small pay loaders or bulldozers to push cc block over board etc.

iv. Method of ensuring the geobags are dumped in the required numbers in the specified locations, in required quantities and thickness.

v. Details of records for the position of the dumping barge/boat, and the number of dumped bags.

g. Placement of Geo-bag Wire -netting box

i. Detailed description of where and how the Geo-bags in Wire -netting box will be prepared

ii. Detailed description of placement device, such as gantry crane operated from twin hull pontoon, or any other suitable machineries

iii. Detailed description of placement device or any other suitable machineries

iv. Anticipated daily production rate of crates and systematic construction of crates

h. Transport of Geo-bag / and Wire -netting box

i. Detailed description of Wire -netting box filled with geo bagas toe key at the specified location.

i. Slope Trimming and CC Block Pitching

i. Details of earth work for toe key and for slope trimming.

ii. Details of cc block pitching work in slope including laying of geo-textile sheet and filter media

j. Slope protection works

i. Method of collection and transportation of cc blocks.

ii. Method of manufacturing cement concrete block and transportation. (iii) Method of earth work in bank slope trimming.

iii. Method of laying and stitching of geo textile filter cloth.

iv. Method of constructing CC Block Crates and galvanized wire net and placing.

v. Method of laying CC Block in slope and in top key.

vi. Type, source, quantity of equipments such as excavator, tripper, concrete weigh batcher, mechanical mixer, vibratos with requisite power and capacity.

vii. Anticipated daily production and laying of cement concrete block.

k. Anchor Arrangements

i. Description of anchor/dead man arrangement intended to shift, position and hold barge/machine boat/pontoon or other dumping aids, including methodology for lifting and repositioning the anchors

ii. Sizes of dumping barge/large machine boat or dumping aids

iii. Details of any modifications to pontoon or dumping aids to permit the fixing of winches and other equipment

iv. Confirmation that the equipment is suitable for the work.

l. Checking of completed work

i. Description of survey equipment, methodology, and data collection and processing during implementation showing that the work will be executed in strict compliance with the technical specifications and the implementation design; including details (number, make, type, etc.) for both land and water survey equipment

ii. Details of data processing and storing

iii. Method of record keeping and Quality Assurance (iv) Monitoring of construction activities

iv. Procedures for taking still photographs and continuous video recordings during dumping/placement operations to provide systematic records of the controlled, systematic dumping of Geo-bags,

v. Name of diving company, number of qualified divers, details of equipment (number, make, age), and survey methods to identify gaps in the Geo-bag coverage.

2.6.6 The Contractor's Method Statement will explain how the Contractor intends to complete a work under the particular site conditions and is considered an important element to identify responsive bidders. Complete information must be supplied with the Contractors tender, in order to evaluate technically responsive bidders.

2.7 Other Parameters

Notwithstanding specific stipulations of these specifications, the Bill of Quantities (Section 4) or other conditions of the contract, the Contractor has full responsibility to:

a. Obtain all necessary physical data, such as climate, topography, land use, river conditions, erosion history, etc.
b. Obtain permits, rights of way, lease land etc.
c. Identify and make arrangements for the provision of suitable equipment
d. Prepare practical work methodologies, and
e. Get familiar with the local conditions.
f. Obtain Geo technical conditions of the sluice gate.

Any deficiencies, other than Employer's Risk as stipulated in the Section 7 General Conditions of Contract (GCC), Sub-section 17.1 & 17.2, will in no way entitle the Contractor to variations or payments for any form of damages.

The Contractor will provide shelter from sun, rain, and wind for all employees and the supervising engineers on land and on all floating equipment, throughout the duration of the works.

2.8 Environmental Management Plan and Safety at the Site

2.8.1 Environment

Inspector

The Contractor will employ one fulltime inspector for supervising compliance with the environmental management plan. The environmental inspector will keep one set of current environmental standards and regulations at the site at all times, available for consultation. The environmental inspector will submit an Environmental Management Plan and a monthly environmental report incorporating monitoring, Evaluation and institutional measures to be taken during implementation and operation in the project site and immediate vicinities to reduce the pollutions to acceptable levels. The EMP also will include the actions needed to implement this measures. The report will be written in English language in a format acceptable to the Engineer. Details of Environmental Social Management has been appended in this bid documents as appendixes 1 to 5 from page no 287 to 300.

Air and Noise

The Contractor will regularly spray water on dry surfaces to reduce dust problems. The Contractor will regulate vehicle emission and noise in accordance with current legislation of India. The Contractor will avoid unnecessary noise, especially at night.

Land Use

The Contractor will remove and store topsoil for replacement after construction. The Contractor will restore the surface vegetation in his work areas to the level found before the start of work. This includes the replacement of topsoil removed before construction.

Pollution

The Contractor will prevent spills of oil and lubricants from vehicles, engines, etc. Used engine oil must be removed in an environmentally acceptable manner in accordance with current legislation of India.

Disruption of Agricultural Activities

The Contractor will minimize the disruption of any agricultural activities within the flood embankments. Any disruption of private agricultural land used will be compensated by the Contractor at the current market value.

2.9 Access Routes

2.9.1 Navigation

There are important navigation routes along the project site. It is the sole responsibility of the Contractor not to block navigation routes, to minimize interference with riverine traffic, and to get all necessary clearances from competent authorities for the construction of riverbank protection works. All of the Contractor's floating equipment will follow navigation and safety standards applicable in India. The Contractor will coordinate any dredging operation with WRD and Inland Waterways Authority as far as it could concern river navigation routes.

2.9.2 Roads

The Contractor will inspect all access roads for their appropriateness for moving construction equipment or materials. Roads found inappropriate will be strengthened by the Contractor. If the access road degrades more than to be expected under normal use, due to the Contractor's activities, it will be repaired by the Contractor at his own cost.

2.10 Excavation and Filling of Earth in Slope Protection

Earth excavation and filling activities will take place after the area has been surveyed by the contractor and inspected by the Engineer. The Contractor will submit a map indicating the areas of planned earth excavation and filling activities; together with cross-sections showing earth cut and fill areas, based on the results of the baseline survey, within one week of survey completion. All earth excavation and fill volumes must be confirmed and revised by the Engineer in charge of the sub-project during the subsequent pre- work survey, before actual excavation and filling work can proceed.

2.10.1 Sand Excavation

Sand Excavation will take place in suitable areas inspected by the Engineer prior to the start of the Excavation activities and after written approval. The Contractor will submit a map indicating the areas of planned sand excavation activities, within three weeks of being awarded the contract, and at least one week before starting the work. Sand Excavation close to the work site and char inhabitants will be avoided.

2.11 Safety Precautions and Medical Attendance

a) Safety precautions will include, but are not limited to sound design and measures of Temporary Works, adequate illumination for night operations, instruction in accident prevention for all employees of the Contractor, adequate life protection and life saving equipment (including but not limited to safety helmets and life jackets), adequate traffic control and sign boards, guards, walkways, scaffolds, ladders, bridges, gangways and other safety devices and equipment as may be necessary to prevent accidents or injuries.

b) The Contractor will at all times maintain adequate first aid attendance on the Site including a first-aid nurse. In addition the Contractor will make necessary arrangements with a qualified medical doctor to be called to the Site when required for routine or emergency consultation. The Contractor will provide health inspection and vaccination against acute contagious diseases to workers as the situation may warrant.

c) The Contractor will promptly, but in any case within twenty-four (24) hours of the occurrence of any accident at or about the Site, or in connection with the execution of the Works under the Contract, report all accidents to the Engineer or his Representative. The Contractor will also report all accidents to the competent Authority, whenever such a report is required by law.

d) The Contractor will employ one full time safety inspector. The inspector will keep one set of current safety standards and regulations at the site at all times, available for consultation. The Safety Inspector will

supervise the adoption of appropriate safety measures at the construction site and on all floating equipment in compliance with standards and regulations of India. The safety inspector will submit monthly safety reports. The reports will be written in the English language in a format acceptable to the Engineer.

2.12 Site Installations

2.12.1 The Contractor's preparation of the construction site and of all working and storage areas inside or outside the premises, and transport and assembly of all plant and equipment, complete, as required for the satisfactory execution and completion of the Works, will include but is not limited to the following:

(i) clearing obstructions, grading, and improvement of working and storage areas;
(ii) protection of existing structures;
(iii) protection of trees for their preservation;
(iv) construction of temporary roads as required;
(v) building and furnishing/outfitting of all required offices, workshops, testing laboratories, stores, material sheds, and sanitary facilities;
(vi) installation of power, lighting, water, telephone, and any other supply lines, as well as radio communication;
(vii) fencing of the site areas and the fixing of all required safety and warning signs, etc.;
(viii) transport and assembly, ready for use, of all land and water based construction equipment, survey and diving equipment, generators, spare equipment, tools, etc.

2.12.2 The Contractor must submit to the Engineer, detailed compilations of all land and water based planned construction equipment with pertinent layout drawings on its set-up location, as well as drawings on the layout of storage and working areas with their approaches.

2.12.3 The Contractor must provide and maintain reasonable sanitary facilities, proper lighting and adequate protection of the Site against accidents, theft and the like. The Contractor will organize the disposal of wastes in an environmentally acceptable manner, in accordance with environmental standards and regulations of India.

2.12.4 The Engineer or his Representative is authorized to check the Site installation at any time, and if required, to demand extensions, additions and special repair or maintenance measures.

2.13 Compliance with Environmental Management Plan

a) The Contractor will work in strict compliance with the principles of the Environmental Management Plan. No part of the work will be started before environmental and safety inspectors and first aid nurse are present at the site. No part of the work will be started, or if defects are found later, continued or restarted before complying with all conditions of Sub-section 2 in this Section.

b) The Contractor will remedy any damages resulting from non-compliance of stipulations of this Sub-section 2 at his own cost. All work will be stopped until compliance is assured.

c) If the Contractor is not able or unwilling to start remedial work within five working days after detection of any defect or omission, the Engineer can order remedial works through third parties. The cost for third-party services are to be borne by the Contractor and will be deducted from the Contractor's invoices or from the Retention Money.

2.14 Measurement and Payment

Protecting the Environment

The Bill of Quantities contains separate line items to include all costs for protecting the environment. Cost for complying with all requirements related to construction of labour camps/ancillary sites, strengthening and/or repair of roads, rehabilitation of ancillary sites etc. are deemed to be included in the specific line item in the bill of quantities. Cost for specific activities related to the work, such as stripping and replacing top soils (agricultural soil), dust suppression, water supply, sanitation facilities, camp site waste disposal, control of pollution from leakage and spill of oils and lubricants, safety and warning signs/signals etc., should be included in this line item in the bill of quantities. Payments will be made on the basis of available market rates and prevailing schedule of rates of Government of Assam.

3. Drawings and Documents

3.1 General

3.1.1 Standard Size of Drawings

All drawings will be preferably in A3 (297 x 420 mm) format (scale 1:300 or a scale to be agreed with the engineer in-charge), but A4 (210 x 297 mm) format will also be allowed. All drawings will be submitted as paper copies accompanied by digital copies, using AutoCAD in its most recent version.

3.1.2 Bid Drawings

Bid Drawings are the drawings prepared by the Engineer and are compiled below in this Section of the bid Documents. The Bid Drawings detail the work to be executed under the Contract, subject to adjustments in accordance with the current site situation at the Project Site prior to commencement of the work. In general, the Drawings are intended to indicate the scope and complexity of the Works and to illustrate sufficient details, enabling the Contractor to prepare the methodology, working drawings and shop drawings to the extent required.

3.1.3 Working Drawings

Working Drawings are drawings to be prepared by the Contractor and supplemented in consideration of actual site conditions and as the Works are progressing. The working drawings will include the baseline survey, and the pre and post-work surveys performed during the construction period as detailed in the Technical Specifications, Sub-section 1.5.2, and the bathymetric surveys performed during the flood period as detailed in Technical Specifications, All working drawings will show

sufficient dimensions, and specific and typical details to define the various features of the Works, thus enabling the Contractor to perform the relevant works and to prepare As-built drawings.

3.1.4 Documents to be supplied by the Contractor

The drawings and documents to be provided by the Contractor include, but are not limited to the following:

i. Detailed site layout and installation drawings.
ii. Work and construction programs inclusive of revisions, to the extent required as per Conditions of Contract.
iii. Detailed work method statements for each category of the Works, including cutting and filling plans showing the quantity of earth for each section.
iv. Topographic and bathymetric survey and setting-out drawings.
v. Drawings and calculations for all Temporary Works and construction stages planned by the Contractor. Any supplementary working drawing considered necessary by the Contractor.
vi. Reports and records of all tests for material and proposed works to be carried out by the Contractor or his manufacturer or supplier.
vii. Drawings, records and reports on specific construction measures to be supplied by the Contractor in accordance with the provisions of the Contract.
viii. Quantity tabulations, surveys and drawings as required for the measurement and payment of the Works.
ix. All necessary digital photographs and video recording of stacking, placing and dumping (date wise) of Geo- bags and cc crates.
x. As-built drawings for all Permanent Works, incorporating all changes or amendments made in the course of the construction works.
xi. As-built drawings will be supplied to the Engineer as the Work progresses and immediately after completion of the particular part of the Works and not later than 14 days after the completion in a specific section.

3.1.5 Checking of WRD Site Engineer's Documents by the Contractor

i. The Contractor is obliged to check thoroughly the Bid Drawings enclosed herewith, on the basis of the results of the Contractor's surveying work, with regard to the correctness of all main dimensions and levels, and to inform the Engineer of any necessary corrections.

ii. Before manufacturing, supply and/or execution of any part of the Works, the Contractor must examine and verify the drawings of the site Engineer (WRD), with regard to the technical feasibility of construction, to the correctness of dimensions, as well as all other aspects, which are of significance for the execution and completion of the Works and remedy any defects therein. The Contractor will inform the site Engineer (WRD) of any circumstances, which, in the Contractor's opinion, should involve a change in the design.

iii. Any residual errors and omissions in drawing that have been examined and verified by the Contractor, insofar as they have a negative effect on the execution and completion of the Works, are solely at the expense of the Contractor and do not entitle the Contractor to any extra claim.

3.1.6 Checking of Contractor's Documents by the site Engineer of WRD

i. All As-built drawings prepared by the Contractor for the Permanent Works are to be submitted to the site Engineer of WRD for checking and approval. All drawings and supporting calculations whenever prepared by the Contractor for Temporary Works and construction stages are to be submitted to the Engineer for his information and/or comments.

ii. The formal approval or the comments of the Engineer do not release the Contractor of his responsibility and liability for the proper execution and completion of the Works or for remedy of any defects therein, in accordance with the Conditions of Contract.

iii. All digital photographs and video recording of stacking, counting, placing, loading and dumping of Geo-bags and pitching of CC blocks are to be handed over to the site Engineer of WRD.

3.1.7 Use of the Documents

The execution of the Works and/or manufacture of materials according to the working drawing of the Contractor will not start unless either a copy of the respective drawing, approved by the Engineer through signature, is available or the approval is conveyed in writing or by cable in special cases.

3.1.8 As-built-drawings

As-built-drawings will consist of a detailed plan view of the protected slope and will be supported by pre and post-work survey cross-sections from embankment crest to the toe of the protected slope. The cross- sections for the placement of controlled dumping of Geo-bags below Lowest Water Level will be at a 5m spacing interval. Cross-sections will contain all topographic and bathymetric information from the pre and post-work surveys.

3.2 Standards and Regulations

3.2.1 General

i. The term "Standard" used anywhere in this Section under Technical Specifications means a Standard or Code of Practice relevant to the subject, whether already indicated in the Technical Specifications or otherwise agreed to by the Engineer.

ii. Wherever reference is made in the Contract to specific standards and codes to be met by the goods and materials to be furnished, and work performed or tested, the provisions of the latest current edition or revision of the relevant standards and codes in effect will apply, unless otherwise expressly stated in the Contract.

iii. If Standards conflict with the Technical Specifications in this Section, the latter will govern.

3.2.2 Manufacturers' Direction

The Contractor will observe the directions of manufacturers and suppliers, with regard to the use of materials and/or installation of equipment.

3.3 Construction Materials

3.3.1 General

i. All materials for Temporary Works and Permanent Works which are earmarked for the construction of the Works will be of the best quality of their respective kinds as described in the Technical Specifications.

ii. Insofar as certain construction materials for Temporary Works and Permanent Works are not specifically mentioned or no additional special tests are specified, the materials must at least meet the respective requirements of the Standards approved by the Engineer.

iii. When any material or article must comply with a particular Standard, such material etc. or its original container will bear the stamp of the registered certification trade mark of the relevant

Standard. Alternatively, the Contractor will submit test certificates, furnished by the manufacturer, indicating compliance with the Standard.

3.3.2 Material Samples

Where specified or otherwise required by the Engineer, material samples will be provided free of cost by the Contractor prior to placing final supply orders. Such samples will facilitate approval of material and quality control of supplies throughout the Works.

3.3.3 Examination and Tests

Materials or articles will be made available or delivered to the Site at least four weeks before they are required for the Works, enabling the Engineer to take such samples he may consider suitable for examination and testing. The Contractor will arrange continuous testing for materials supplied in larger quantities over a longer period of time.

3.3.4 Protection

All materials or other items intended to form a part of the Works, whether during transport or stored at Site, will be adequately protected against contamination, deterioration, damage and the like, at any stage for any cause. Such items, which, in the opinion of the Engineer, became unfit for use in the Works, must be removed from the Site immediately and replaced, all at the cost of the Contractor.

3.3.5 Rejection of Materials, Plants and Workmanship

Any materials or articles not in accordance with the Standards and, Technical Specifications may be rejected by the site Engineer of WRD. Any materials or articles rejected by the Engineer will be removed immediately from the Site. Replacement will be provided at the Contractor's own cost. In selecting the mode of transportation of replacement materials, the Contractor must give due consideration to the project time schedule.

3.4 Workmanship

3.4.1 General

Workmanship will be of the best quality appropriate to each category of work and according to the Standards and Technical Specifications.

3.4.2 Information of the Engineer of WRD

All operations have to be carried out in close coordination with the Engineer of WRD, who is to be informed well in advance of the start of any new operation and of the day-to-day activities. Prior to the commencement of any particular work, the Contractor will inform the Engineer about details of his proposed methods, schedule and sequence of operations to be followed. No new operation or work in any new area will be started until the site Engineer's consent has been obtained, which must be given within three working days.

3.4.3 Contractor's Responsibility

Notwithstanding of any testing and/or approval by the Engineer, the Contractor will be fully responsible for the quality of the Permanent Works in accordance with the Contract. Authorization to repair and/or refinish will not constitute a waiver of the Engineer's right to require replacement of any work, if and when after such repairing and/or refinishing the work is unsatisfactory in his opinion.

3.5 Testing and Inspection

3.5.1 General

i. All materials and items intended to form or forming a part of the Works, and all workmanship and all work under the Contract will be subject to the approval of the Engineer and from time to time be subjected to such examinations and tests as provided for in the Standards and Technical Specification and as the Engineer may direct at the place of manufacture or fabrication, or at the Site, or at any other place.

ii. The Contractor will provide all such attendance, assistance, facilities, instruments, machines, plant, equipment, labour, materials, items and transport as required for examining, measuring, sampling and testing the work and the quality, weight and quantity of materials and items intended to form or forming a part of the Works, as and when selected and required by the Engineer, and the Contractor will repair or replace such work, materials and items if necessary in the opinion of the Engineer.

iii. The costs for samples, sampling, testing and inspection intended and provided in the Standards and Technical Specifications will not be compensated separately and are deemed to be covered by surcharges and overheads included in the rates provided in Section 4, Bill of Quantities

3.5.2 Samples

i. Samples will be taken in accordance with the relevant Standards, and in such a way or by such a method and to such a number, that they can be considered to be representative for the full quantity of materials and items from which they are taken or for the workmanship being tested.

ii. Samples submitted for approval of materials and for items to be supplied or of the standard of workmanship and which are subsequently approved, will be kept by the Engineer or his Representative, who will reject all materials or items or workmanship not corresponding in quality and character to the approved samples.

3.5.3 Tests

All materials and items intended to form a part of the Works will be tested in accordance with the Standards and Technical Specifications before starting the work. For the Engineer's approval, the Contractor will obtain and supply test certificates of test results for each category of materials from a recognized test laboratory acceptable to the Engineer. All such test costs will be borne by the Contractor.

3.5.4 Inspection of WRD site Engineer

Whenever considered appropriate by the Engineer, inspectors will be sent to the manufacturer's or supplier's premises to test or to witness the tests of the materials and items or to inspect the manufacture.

The Engineer or his inspectors will have free access to all such places of testing, and the Contractor will impose these conditions on all his sub-Contractors and/or suppliers.

3.5.5 Right to Reject of WRD site Engineer

Neither producing of manufacturer's test certificate, nor the omission of the Engineer to send an inspector, nor the presence of the Engineer or his Representative during testing or manufacture at the manufacturer's or supplier's premises, will prejudice the right of the Engineer or his Representative to reject after delivery to the Site, materials or items intended to form a part of the Works, which are found unsuitable or not to be in accordance with the Standards and Technical Specification.

3.6 Measurement and Payment

3.6.1 Drawings and Documents

All implemented work will be paid based on measurement records confirmed by the engineer, resident engineer, and the supervision engineer, and the as-built-drawings submitted by the Contractor and accepted by the Site Engineer of WRD.

3.6.2 Construction Materials

Unless otherwise designated, the costs of all tests, being required in accordance with the Standards or the Technical Specifications, will be deemed to be included in the rates of the relevant item of Technical part- appendices to technical part, Bill of Quantities.

3.6.3 Testing and Inspection

The cost for all testing and inspection are deemed to be included in the bill of quantities.

3.6.4 Certification of Bills by Consultant

As an additional quality control measure, the Project Management Consultant will carry out random quality audits to certify that the work, for which payment is being requested, has been completed to proper design and technical specifications, prior to submission to the Engineer for approval and processing payment.

4. Main Construction Equipment

4.1 General

4.1.1 The Contractor will identify suitable equipment for the execution of works. The Contractor is obliged to check the construction equipment proposed in his work methodology with regard to number, size and condition and workability immediately after the issue of Notification of Award by the Employer. The Contractor takes over the sole responsibility for the construction equipment placed at his disposal by different owners, and the Contractor assumes all other obligations, including watch and ward, which would incur to him if he were providing the said construction equipment under the Contract.

4.1.2 The Contractor will nominate and delegate for the entire duration of the construction works, an experienced mechanic as Contractor's Representative for the construction equipment along with skilled operators, mechanics, electricians, and welders. The Contractor's operators, mechanics and the Contractor's representative will be permanently present from the time of taking over of the Site and/or deployment of construction equipment and in particular during the period of assembling and start-up of the said

equipment. The trained personnel will not be withdrawn from the Works by the Contractor without the knowledge of the Engineer. No work will start or recommence without the presence of Contractor's Representative at the site.

4.1.3 The Site Engineer (WRD), however, reserves the right to require any incompetent personnel to be replaced by the
Contractor, who:

(i) persists in any misconduct or lack of care;
(ii) carries out duties incompetently or negligently;
(iii) fails to conform with any provisions of the contract; or
(iv) persists in any conduct which is prejudicial to safety, health or the environment.

If appropriate, the Contractor will then appoint a suitable replacement person within one week.

4.1.4 The Contractor has to load, transport, unload, unpack, assemble and mount the individual special equipment items, including providing any modification or adaptation of his own equipment to suit the said special equipment. He has to secure and maintain the same for the entire period of use, all in accordance with the Conditions of Contract, the Technical Specifications and Bill of Quantities.

4.1.5 All equipment and machines operated at the site and used for construction purposes, can at any time be inspected by the Site Engineer (WRD) or any of his Representatives and be rejected whenever found inappropriate. All inspections will take into account the good execution of the Works and their timely completion.

4.2 Equipment

4.2.1 The Contractor has to organize sufficient number of different equipment for the timely execution of the works as outlined in the Contractor's method statement. Necessary equipment will include the following: flat top barge/pontoon, power driven country boats, heavy anchor including deployment and lifting equipment (tug boat and barge mounted crane or self-propelled working boat with A-frame), generator, handheld sewing machine, sand testing laboratory, total station or DGPS, echo-sounder, survey boat, computer with printer, diving equipment, video camera, and digital camera, as itemized in Appendix to Technical Part: Equipment, Forms for Equipment

4.2.2 Contractors need to make alternative arrangements and clearly identify the alternative in their work methodology in case the main equipment is not available for the duration of the Works. The alternative source, however, will, in no way, relieve the Contractor from his responsibility to organize other suitable replacements after contract award when his named sources are not available for any reason.

4.2.3 The Contractor will inspect and assess the conditions and structural soundness of all equipment prior to lease or hiring and prepare them for the purpose of his work. All equipment, strengthening work, movable and immovable elements installed by the Contractor or already installed will comply with all relevant safety standards.

4.3 Mobilization of Equipment

The equipment will arrive at the Site and be available for work before or on the dates as per plan.

4.4 Measurement and Payment

The Contractor will provide the type, base characteristics, number, types and working condition of the equipment.

5. Site Areas and Installations

5.1 Locations and Access to the Sites

5.1.1 The project layout map is shown in this Section of the Bid documents. The map shows the location where the construction work is to be executed. The Contractor should become acquainted with the specific site and access conditions.

5.1.2 Sites may be accessible from the land as well as the riverside. This has to be taken into account in the preparation of tender specially when setting up the work methodology.

5.1.3 The Contractor will be deemed to have assessed the site and the road access to the Site, including the load bearing capacity of surrounding earth, roads and bridges, and to have provided for all costs for the improvement, strengthening or repair of such infrastructure, as may be required for or due to the transportation of materials, equipment etc. to the Site.

5.1.4 Problems and delays arising from wrong judgment of site and access conditions do not entitle the Contractor to any claim in this regard.

5.2 Commencement Date and Site Possession

The Contractor will take possession of the Site at the latest within the period stated in Section IX GCC 1.1 (ddd)

5.3 Working and Storage Sites

5.3.1 All the areas the Contractor needs for preparation or storage or any other need, beyond the acquired available area, must be leased or rented by him at his own cost and risk. These areas must be adequately large to assure execution of highest quality standards within the time frame. The Contractor will take into account the provisions regarding the Environmental Management Plan and Safety at the Site as defined in Section IX (Appendix 1 to 5).

5.3.2 All costs in connection with renting, preparing and maintaining of any of the site areas and facilities will not be compensated separately and are deemed to be covered by surcharges and overheads to be included in the rates of the relevant items in the Bill of Quantities.

5.3.3 The Contractor will establish the working benchmark posts/pillars and set up 1.50m long, 10cm x 10cm square concrete stakes and a sign board measuring 1.00m x 0.75m fixed at the top of the stake to display the location, date, number of Geo-bags in a batch of work. Similarly, the Contractor will establish the working benchmark posts/pillars and set up 1.50m long, 10cm x 10cm square concrete stakes and a sign board measuring 1.00m x 0.75m fixed at the top of the stake to display the location, date, volume/number of CC Block in a batch of work. The sign board is to be carried by the workers at the time of photo and video recording and should include the appropriate location post designation. These benchmarks and stakes are to be set up at 20 m intervals along the base line (immediately along the bank line) to help record the sequence of work activities and to facilitate the accurate placement of Geobags above Lowest Low Water and controlled dumping of sand filled Geo-bags (as applicable) below Lowest Low Water.

5.3.4 The construction, storage and working areas together with all land and water-based equipment is to be marked, for both day and night use, with appropriate markings, lights signals etc., in conformity with safety regulations of the competent Authorities in India.

5.3.5 The Contractor is responsible and has to provide for all of his equipment and arrangements for the regular supply of power and water including drinking water to the storage and working areas, as well as to the actual construction site in the capacity and quantities required for the Works.

5.4 Requirements for River Navigation

5.4.1 The Contractor will appropriately position and mark the waterborne site area including all temporary moorings of floating construction equipment and obtain any necessary approval as/if required from the Inland Water Transport Authority of India (IWTAI) or any other competent authority in Assam. The Contractor will notify the competent Authority of any such installation well in advance of any construction activity in line with current regulations.

5.4.2 The Contractor will comply with all directions issued to him by the ite Engineer (WRD) or his Representative in respect of safety of navigation and the requirements for marking, watching and lighting of any structure or construction equipment, which may be used in the construction of the Works.

5.5 Coordination with Authorities

The Contractor must generally observe all rules and regulations in force of the various Authorities, which may influence the preparation and/or performance of the Works in any way. The Contractor will ensure necessary coordination of all activities with the Authorities concerned, well in advance of any construction activity.

5.6 Follow-up of Water Levels at the Site

5.6.1 The Contractor must take necessary precautionary measures with regards to flood forecasting and warning. Generally, the State WRD can provide recent water level records at most sites. The Contract should also establish a temporary water level gauge near the work site and regularly monitor water levels.

5.6.2 The Contractor must have good knowledge of current water levels and river currents and be able to adapt the work program whenever potential problems arise, e.g. from extremely low water levels or early flooding that influence the accessibility of and the work at the site.

5.7 Protection against Natural Phenomena

5.7.1 The Contractor will protect the Works against any damage, which may result from:

- **i.** flood flows;
- **ii.** wind,
- **iii.** storm and heavy rainfall; and will adapt the program of works in order to minimize the risks.

5.7.2 Levels within 0.3 m below the lowest water levels and above the highest water level as indicated in Sub- section 1.6 of this Section are not considered as being exceptional.

5.7.3 The Contractor will submit to the Engineer on his special request any method he proposes to apply in order to protect the Works.

5.8 Clearance of the Site

After completion of the construction works, the entire project area is to be cleared of all obstacles created by the Contractor during execution of the Works or of any Temporary Works and construction plant used by the Contractor. Any working and storage areas, approaches etc. or handling facilities utilized by the Contractor or his Sub-Contractors for the purpose of this Contract are to be cleared and/or reinstated by the Contractor to the satisfaction of the relevant owner(s). The Site Engineer (WRD) will not accept any claim of third parties in respect to the Contractor's failure to comply with this requirement.

5.9 Measurement and Payment

5.9.1 Mobilization of Site and Construction Equipment

All costs for mobilization of site, construction equipment, preparation of all site areas and their approaches and providing of all buildings and other facilities are deemed to be included in the Bill of Quantities.

5.9.2 Maintenance and Operation of the Site

All costs for maintaining, operation and protection of the Site and its installations and facilities are deemed to be included in the rates of the relevant items as shown in the Bill of Quantities. The costs of all measures required by the Contractor to protect the works are deemed to be covered in the rates of the relevant items of Bill of Quantities.

5.9.3 Site Demobilization

All costs for demobilization of the Site, as well as for its clearance and final reinstatement will be borne by the Contractor.

6. Surveying Work

6.1 General

6.1.1 The Contractor will provide experienced personnel for both the land and water survey teams and survey equipment suitable for all seasonal weather and river conditions. The contractor will also provide experienced data analysts with appropriate software to properly analyze the survey data. The contractor will provide appropriate accommodation to both the survey teams during the entire contract period.

6.1.2 Coordinates are to be based on the India Transverse Mercator Grid of the Republic of India. Elevations are based on the PWD (Public Works Department).

6.1.3 For the determination of levels or coordinates for construction purposes, the Engineer or his Representative will set up together with the Contractor the parameters, such as the extent of survey works, chainage to benchmarks, installation of new marks etc. These items will be referred to, throughout all subsequent surveys carried out under this contract.

6.1.4 For all survey works, the reference benchmark(s) will be identified and described. The Contractor will establish benchmark pillars within the project area not more than 300 meters apart, covering the whole length of the work. The benchmark pillars should be concrete (1:2:4 mix) with minimum dimension of 380 mm x 380 mm x 750 mm, with the top 50 mm above ground. Each pillar will have an inscription of "AIRBMP-WRD" on top. Their location and levels as well as a description will be handed over to the Engineer within two weeks of their installation in a format acceptable to the Site Engineer of WRD

6.1.5 The Contractor has the obligation to check all measurements, dimensions and levels indicated in the drawings. Whenever discrepancies occur, he has to inform the Engineer in writing within three working days, describing the type of discrepancy and consequences to the execution and quality of works. Otherwise, he has to bear the full consequences that arise from these discrepancies.

6.1.6 The Engineer has the right to ask for repetition of surveys when these are considered false. He/she can at any time employ his own survey team or third parties for control surveys. In such case, the cost will be borne by the Contractor.

6.1.7 Plans and cross-sections and all other survey results will be established by the Contractor. These results have to be made available to the Engineer.

6.2 Construction Period Survey Works

6.2.1 The survey works performed during the first and second year construction periods will include the land and water base-line survey, and the pre and post-work surveys should be included in the relevant items of the Bill of Quantities

6.2.2 All land topographic surveys will be done using a Total Station or DGPS. All water bathymetric surveys will be done from a survey boat using an echo sounder and DGPS or RTK GPS...

6.2.3 The baseline survey is to be done at the start of the construction work to confirm the overall design concept and to revise the estimates of quantities.

6.2.4 The baseline survey should include at least 50 m of the floodplain on the countryside of the bank line and extend 50 m beyond the riverside end of the falling apron. Baseline survey cross-sections should extend from the upstream to the downstream limit of the flood protection work at 50 m spacing intervals.

6.2.5 Results of the baseline topographic survey, in the form of plans and cross-sections both in hard and soft copies will be handed over to the Engineer within one week upon completion of the surveys but not later than two weeks prior to starting the protection work.

6.2.6 The land based pre and post-work topographic survey cross-sections will be done at a 10 m interval spacing and extend from Lowest Low Water up to at least 10 m beyond the crest level of the bank line. The water based pre and post-work bathymetric survey cross-sections will be done at a 5 m interval spacing and extend from Lowest Low Water to at least 10 m beyond the riverside end of the falling apron.

6.2.7 The pre-work survey is to be done within 3 days of starting the excavation and filling work for placement of Geo-textile filters above water and within 3 days of starting the controlled dumping of the first two layers of Geo-bags below water. The pre-work survey results, plan and cross-sections, are to be available at the time when the construction work is actually done. The post-work survey is to be done within 3 days of completion of laying of geo-textile filter and pitching of CC Block and within 3 days of completing the controlled dumping of the first two layers of Geo-bags. The post-work survey results, plan and cross-sections, are to be presented to the Engineer within 2 days of completing the post-work survey.

6.2.8 Should the pre or post-work surveys fall behind the implementation schedule, the works will be stopped or the Contractor will hire one or more additional survey teams to make up the delay at the Contractor's own cost as decided by the Engineer in charge of the sub-project.

6.2.9 The pre- and post-work survey will form the As-built-drawings. The contractor will submit the As-built- drawings for all works completed as mandatory element of payment requests for any completed works.

6.2.10 All electronic data will be directly submitted to the Engineer or his Representative immediately after completion of each survey. This includes all raw data for both the topographic or bathymetric surveys.

6.3 Flood Period Survey Works

6.3.1 The Contractor will conduct flood season surveys during any flood season within his work schedule and the first flood season after completion of the works and within the defects liability period. The survey works performed during the flood season will include four monthly bathymetric surveys, one each during the months of July, August, September and October.

6.3.2 The flood season bathymetric surveys will be conducted from a survey boat using an echo sounder and DGPS and digital data logging and processing.

6.3.3 The bathymetric survey will extend 400 m into the Brahmaputra River from the left bankline and commence 500 m upstream of the beginning of the work site and end 500 m downstream of the work site. Cross- sections will be taken at 50 m intervals, using the same cross-section stations established for the previous surveys performed during the first construction season. And the same process will be continued in the next constructions seasons till the completion of the work.

6.3.4 In addition to the cross-sections, the surveys are also to include 3 longitudinal-sections that will run parallel to the bank line. These 3 longitudinal-sections are to be spaced at 100 m intervals, starting at 100 m from the bank line (i.e. 100, 200 and 300 m from the bank line). The purpose of these longitudinal-sections is to identify possible narrow scoured stretches that may fall between the 50 m spacing cross-sections.

6.3.5 Coloured bathymetric maps and individual cross-sections and longitudinal-sections will be produced from the bathymetric surveys. These maps will identify bathymetric changes in the river bed, and areas where scour and deposition are taking place. In particular, the maps will identify areas where additional geo- bags will be required during the second construction year due to launching of the falling apron.

6.3.6 Results of the bathymetric surveys, in the form of plans and sections, both in hard and soft copies, will be handed over to the Engineer within one week upon completion of the surveys. All electronic data, including all raw data, will also be directly submitted to the Engineer or his Representative immediately after completion of each survey.

6.3.7 The record of bathymetric surveys and other surveys conducted by the contractor will be recorded in register which will be available at site.

6.4 Accuracy of Survey Works (Using UTM 46N)

The accepted maximum mis-closure for a line of levelling closing back on the starting point will be $\leq \pm 10\sqrt{K}$ mm, where K is the length of the circuit in kilometers

6.4.2 As a guideline, mis-closure values of a loop traverse will be within the accuracy of a first order traverse, i.e. 1in 25,000 for unadjusted horizontal distances and 2 $\sqrt{N}$ sec for unadjusted horizontal angles (N equals the number of legs of the traverse).

6.4.3 Measurement by metallic tape must be within 0.5 cm for x and y coordinates (plane) and 1.25 cm for z coordinates (altitude).

6.4.4 The accuracy of placed barge/boat used for controlled dumping of bags will be within 0.3 m in the horizontal (x and y) directions.

6.4.5 The accuracy of positioning spot levels surveyed on land will not be less than ± 2.5 cm in Z and ± 5 cm in X and Y, and surveyed in the river will not be less than ± 5 cm in Z and ± 15 cm in X and Y

6.5 Water Levels

The Contractor will record water levels constantly at the Site in reference to the CWC Chenimari telemetric gauge site, and make these available to the Engineer daily. The frequency of gauge readings will be four times daily. Two gauges will be installed at the Site, one at the upstream end of the work site and the other at the downstream end of the work site.

6.6 Sounding

The Contractor will ensure that the specified thickness of the area coverage along the bank slope and launching apron are maintained as per Technical Specifications and Drawings.

The Contractor will ensure that the sounding works provide accurate and reliable results so that pre and post-work surveys can be compared by the Engineer or his Representative. The use of the same cross- section reference points is obligatory.

Sounding will be undertaken by echo sounder and DGPS or RTK (Real-Time Kinetics) GPS positioning with automatic data logging from a suitable survey vessel. The Contractor will use computer software and output devices to plot the survey data, the results will be presented in plans and cross-sections. All plans and cross-sections must include the date of the sounding, the date of the plan preparation, as well as the water levels at the nearest gauging station during the day of the sounding.

All sounding work will start in the river and proceed towards the bank to avoid latency problems. The survey boat driver will ensure that the echo sounder readings always remain within ± 1 m of the actual cross- section alignment.

6.7 Diving

Diving works will be used to continually to verify the controlled dumping of Geo-bags below Lowest Water Level.

The Contractor will mobilize one team of skilled divers with full logistic supports. The team will work as per the instruction of the Engineer-in-charge. The diving team will, as a minimum, consist of one main diver, one back-up diver and one helper with required equipment.

Diving work will be undertaken on a regular basis to control the quality of the underwater works. Diving sections will follow every second cross-section used in the pre and post-work surveys, at 5 m spacing interval. Diving reports will contain a detailed description of the

quality of the underwater works and the extent of the coverage. The divers will assess the coverage, vacant spaces, if any, and launching pattern of dumped Geo-bags on the bank and riverbed, if encountered. Verification diving is to take place within three days of the controlled dumping, and the diving report is to be submitted to the Engineer-in-charge within 2 days of the verification dive, and include a cross-section drawing of each section containing detailed findings, including the position and condition of the bed. Any defects and deviations from the coverage described in Technical Specifications and shown in Drawings will be clearly marked in such drawings for immediate repair by the Contractor.

The performance of diving teams will be certified by Engineer and the consultant (PMC or an expert recruited by the employer) by a set of independent diver engaged for the purpose, it additionally required. The Engineer / consultant reserves the right to mobilize a separate team of divers (if necessary) for the verification of the works. In case any deviation from contractor's report is observed. In such case the cost will be borne by the Contractor.

If diving inspection falls behind implementation schedule, the works will be stopped or the Contractor will hire one or more additional diving teams to make up the delay at the Contractor's own cost.

The diving results form part of the As-built-drawings and will be submitted as mandatory element of payment requests for any completed section.

6.8 Surveys for Assessment of Placement Accuracy

6.8.1 The basis for the Contractor's planning is typical cross-sections and design sections presented in the Drawings enclosed herewith. These cross-sections indicate the most recent known characteristics of the riverbanks; however, these may have changed by the time the work commences due to the dynamic morphology of the river.

6.8.2 All surveys will be referred to contract bench marks and UTM 46N coordinates and the results will be plotted on a drawing of approved scale and submitted to the Engineer for comparison purposes and approval.

6.8.3 Approved surveys as per above paragraph will serve as a basis for the assessment of permanent works.

6.8.4 The pre-work survey will be used for the detailed dumping plan including positioning of the barge/boat. The dumping plan will take into account the displacement of bags due to the river current.

6.8.5 During controlled dumping, the pontoon will be positioned using Total Station or DGPS equipment. The accuracy of positioning must be within 30 cm in X and Y direction. The Contractor will make provisions for sufficient survey personnel in the teams, to log the position of all the dumping barge/boat during dumping of bags. The raw recorded data will be handed over to the Engineer or his Representative every evening after controlled dumping. In addition, the processed data, in the form of maps, tables and charts will be regularly handed over to the Engineer or his Representative.

6.8.6 No works will be carried out before the pre-work survey is undertaken. The cross-section drawings of the post-work survey will also superimpose the cross-sections from the pre-work survey, and will form the basis for as-built drawings.

6.8.7 Any adaptation in the design due to site situation will be binding upon the Contractor

6.9 Measurement and Payment

A land survey team typically consists of one surveyor and one or two helpers with a total station or RTK GPS, and a computer operator for data processing and plotting. The Contractor decides how many survey personnel are required for the execution of the land surveys as per the Contractor's method statement.

6.9.1 The river survey team typically consists of one surveyor, a driver for the survey boat, and a computer operator. The equipment consists of a DGPS or RTK GPS system and an echo-sounder, professional survey software, and a computer for data processing and plotting. Again, the Contractor decides how many survey personnel are required for the execution of the river surveys as per the Contractor's method statement.

6.9.2 All costs associated with all land and river survey works during the construction period, including baseline and pre- and post-work surveys, described in this Section 7, Technical Specifications, and elsewhere in the tender documents, for the due performance of the Contract, including all equipment and labour costs for taking the survey measurements, processing the data, and generating output tables and drawings are deemed to be included in the relevant item of the Bill of Quantities.

6.9.3 All costs associated with monthly bathymetric surveys during the flood season described in the Technical Specifications, and elsewhere in the bid documents, for the due performance of the Contract, including all equipment and labour costs for taking the survey measurements, processing the data, and generating output tables and drawings are deemed to be included in the relevant item of the Bill of Quantities.

6.9.4 Non-compliance with any of the above-mentioned points qualifies for a price adjustment covering all cost for the execution of the survey work through a third party or the Engineer's survey teams. The cost of the surveys to be deducted for such a situation will be specified by the Engineer or his Representatives at the site.

7. Riverbank Protection and Underwater Slope Protection Works

7.1 Manufacturing and Placing of CC Blocks

Contractor will setup / established one or more manufacturing plant(s) with adequate room, requisite equipments, shades etc. for manufacturing required quantity of cement concrete blocks within ten km from sub-project work site. The manufacturing plan(s) will be easily approachable and accessible by Engineer in charge of the sub-project or his authorized representative for inspection at any time. The cost of all ingredients, labour manufacturing, curing, storage watch & ward, handling, transportation including loading& unloading etc. will be included in the bill of quantities of the particular item.

All required CC Blocks as specified in the Bill of Quantities will be manufactured and supplied at site by the Contractor. The following technical specifications for manufacturing CC Blocks will be followed.

7.1.1 General

The Contractor will supply at site all labour, tools, concrete mixer machines, weigh batcher vibrators, cement, coarse aggregates, fine aggregates, water, steel formwork/shutters and any other materials required for concreting. All operations will be supervised by Contractor's trained staff and full time monitored by Engineer or his nominated representatives.

All sampling and testing of constituent materials and product will be carried out in accordance with the provisions of the BIS (Bureau of Indian Standards) -456 Standard. All sampling and testing will be carried out in accordance with the provisions of BIS 516. The cost for all tests is deemed to be included in the item rate of the contract.

7.1.2 Material Specification

7.1.2.1 Cement

(1) The cement used for manufacturing the CC Blocks will be Ordinary Portland Cement of 43 grade complying with provisions of BIS 8112. The cement will be delivered to the site in sound and properly sealed bags. Tests must be performed from each consignment of cement delivered to the site, for which the Contractor will provide such samples as the Engineer may require for testing.

(2) Manufacture's test certificate is acceptable provided material is procured from BIS approved manufacturer. Cement will be fresh not more than three(3) months old. Each consignment will be covered by test certificate.

(3) In addition to the tests required in the relevant BIS code, the Engineer may also make any further tests, which he may consider advisable or necessary to ascertain if the cement has deteriorated in any manner during transit or storage. In such case the cost will be borne by the Contractor. Cement showing lumps which cannot be broken to the original fineness by finger pressure will be rejected irrespective of age and will be removed from the site immediately.

(4) Any cement which in the opinion of the Engineer is of doubtful quality will not be used until it has been re- tested and test result sheets, showing that it complies in all respects with the relevant standard, have been delivered to the Engineer.

(5) The Contractor will provide waterproof and well-ventilated sheds or go-downs at the specified or approved location at site, having a floor of wood or concrete raised at least 150 mm above the ground. The sheds will be large enough to store sufficient cement to ensure continuity of work and each consignment must be stacked separately therein to permit easy access for inspection. The Engineer or his Representative will have access to the Contractor's work site at anytime during the construction.

(6) The cement will be placed in the sheds immediately upon delivery to the site and will be used in the order in which it has been delivered. Any cement in bags which have been opened will be used immediately after opening.

(7) Cement register will be maintained by the contractor at each manufacturing plant showing date & quantity of receipts & issues, quantity & name of manufacturer, cumulative quantity of receipts & issues and daily balance at plant with signature of representatives of contractor, Engineer in charge of the sub-project and PMC .The register will be made available at all time for checking by the authorised inspecting officials.

7.1.3 Aggregates - General

(1) Crushed stone aggregates will comply BIS 383 and will be hard, strong, durable, dense and free from injurious amounts of adherent coatings, clay, lumps, dust, soft or flaky particles, shell, mica, alkali, organic matter and other deleterious substances.

(2) The various sizes of particles of which an aggregate is composed will be uniformly distributed throughout the mass.

(3) The aggregates will be stored on hard and dry ground with adequate partitions to ensure the separation of different types and grades. Care will be taken in storage to avoid inclusion of any foreign material in the aggregates. The aggregates will be handled carefully so as to avoid segregation of various sizes within each grade.

(4) Testing of aggregates will be in accordance with IS 2386 and IS 2430. The Engineer reserves the right to approve or reject the sources of aggregates. Approval of a source of aggregate by the Engineer will not be construed as constituting the approval of all materials to be taken from that source. The Contractor will not obtain aggregates from sources which have not been approved by the Engineer.

7.1.4 Coarse Aggregate

(1) The coarse aggregates will be graded crushed stone 20 mm nominal size and well shaped. The amount of clay, fine silt and fine dust occurring in a free state or as a loose adherent will not exceed one percent by weight.

(2) The coarse aggregate ie. Crushed stone will be tested in accordance to IS: 2386 and will conform crushing value, abrasion value, impact value, flakiness & elongation index , water absorption , soundness and limit of deleterious material in accordance to IS: 383. Testing of aggregate will be carried out by the recognized independent institute / laboratory before use and at least once in six(6) months or change of source whichever is earlier . All cost of collection, transportation and testing of sample will be borne by the contractor.

7.1.5 Fine Aggregates

(1) Fine aggregates will be non-saline and consist of hard, dense, durable materials and will be free from injurious amounts of clay lumps, lightweight materials or other deleterious substances. The aggregate will be tested according to IS 2386.

(2) Fine aggregates will have a fineness modulus (FM) value equal to or greater than 1.5.

7.1.6 Water

The water used for concrete mixing and curing will be fresh water, clean and free from any substances injurious to the finished product. It will be taken from an approved source and free from objectionable quantities of silt, organic matter, alkali, salt and other impurities. Whenever required to do so by the Engineer, the Contractor will take samples of the water being used or which is proposed to be used for mixing concrete and test them in accordance with IS 456. No concrete will be made with unapproved water.

7.1.7 Design of Concrete Mixes

Concrete mix will be 1:2:4, i.e. 1 part Portland cement, 2 parts sand (FM>=1.5) and 4 parts stone aggregate 20 mm nominal size for CC Blocks. Quality of concrete will be in accordance to IS 456.

7.1.8 Formwork

Formwork and moulds will be constructed to ensure designed uniform shapes and block sizes. They will be of steel sheet of minimum 6mm thick. Moulds will be of rigid construction so as to prevent any in- service distortions. Moulds will not allow any leakage of mortor during casting of blocks. Wherever any defect is noticed in a formwork, it must immediately be replaced as per direction of Engineer's Representative.

7.1.9 Mixing of Concrete and Casting of Blocks

Mixing of concrete will be done by mechanical machine mixer with lifting hopper / power loader capacity not less than 50 kg of cement Unless otherwise permitted by the Engineer, hand mixing of concrete is prohibited. Mixing should be done thoroughly to ensure that concrete is of uniform colour and consistency. Blocks will be cast on a horizontal evenly surfaced platform of brick soling and sand-cement blinding. Concrete vibrator will be used in casting of the blocks. The shutters will not be opened until the concrete is firmly set. Honey combed or partly damaged blocks will not be acceptable. CC Blocks will be of even shape and without visible surface defects. Tolerances in size will not exceed 0.5 cm per side. No touching up or finishing by cement mortar etc. will be permitted on concrete block after it de- moulded.

7.1.10 Finish

All CC block will be free from surface defects such as water retaining pockets, air holes or honey combed formations. There will not be any damage during manufacturing, handling and transportation. Any defective cc block will be rejected out rightly and will be removed by the agency from site within 48 hours.

7.1.11 Tests and Checks

7.1.11.1 Sieve Analysis of Aggregates

The Contractor will collect sample and carry out a sieve analysis of the coarse and fine aggregates at least once in each week when concreting is in progress and at more frequent intervals if required by the Engineer. The grading of all aggregates will be within the respective limits specified. If the fraction of aggregates retained on any sieve differs from the corresponding fraction of aggregate in the approved mix by more than two percent of the total quantity of fine and coarse aggregate, the Engineer may instruct the Contractor to alter the relative proportions of the aggregate in the mix to compensate for such differences.

7.1.11.2 Slump Test

The Contractor will undertake slump tests of the freshly made concrete in accordance with ASTM C 143- 90a or equivalent BIS and the slump will be within the range of 50 to 100 mm. If the range does not comply with the requirement, it should not be used. Slump tests will be carried out on each 50 cum batch of concrete or more frequently if directed

by the Engineer. The records of slump tests will be maintained in a register and be made available for inspection.

7.1.11.3 Concrete Cube Test

i. The sampling of concrete for concrete cubes will, whenever possible, be taken when the concrete is about to be placed into the formwork. Each sampling will provide sufficient concrete to make 3 (three) cubes. Samples will be taken for each 50 cum batch of concrete or more frequently if directed by the Engineer. The cubes will be cured properly and send to a recognized laboratory/ institution through the representative of the engineer. All cost of such tests will be borne by the Contractor.

ii. After stripping, each cube will be indelibly marked with the date taken, the engraving signature of the quality control person in charge, and the prescribed sample number, and sent to a testing laboratory acceptable to the Engineer. If the specified values are not obtained from cube tests on any concrete mix, no further concrete of that mix will be used and the Contractor will establish the cause of the failure and undertake such remedies as are necessary. The Contractor will demonstrate by trial mixes and the results of cube tests that the revised mix is in accordance with the specification. The above-mentioned activities are to be recorded in a register. The register will be made available at all time for checking by authorised inspecting officials.

7.1.11.4 Non-destructive Testing

The Contractor will provide on site a 'rebound' (Schmidt or similar) testing hammer for use by the Engineer for checking the in-situ strength of the concrete. Testing will be carried out at the frequency and in the locations directed by the Engineer. The field test (work test) may be taken by rebound hammer on blocks; the strength should be $\geq 10 N/mm^2$ at 7 days. Any concrete blocks found to be of strength less than specified will be removed from the worksite and replaced by the Contractor at the Contractor's own cost.

7.1.12 Block Dimension

a. Pre-cast concrete blocks will be made to the dimensions shown in Section 6, Drawings. The materials and workmanship will comply with the above Technical Specifications in all respect and to the satisfaction of the Engineer. Diagonals of all sides of block will be checked and no deviation of specified dimension of diagonal will be permitted.

b. The Contractor may, subject to the approval of the Engineer, modify the geometry of the block slightly to facilitate its handling and placing e.g. by incorporating cylindrical holes or horizontal recesses. The Contactor will at his own cost ensure that the finished weight of the block is the same as that of the blocks shown on the drawings by adjusting the linear dimensions of the block accordingly.

c. Any consequent modifications to the design of the blocks will be undertaken by the Contractor at his own cost and to the approval of the Engineer.

7.1.13 Numbering of Blocks

Each block will be marked by date and plant using consecutive numbers and will be recorded in a register. The Contractor will maintain a register mentioning the number,

date of casting, casting plant, the signature of the quality control person, and Contractor's representative, and will make the register available at all times for inspection and checking by authorised inspecting officials. Cost of numbering the blocks in above manner will be deemed to be included in the rate against the BOQ item.

7.1.14 Curing

CC Blocks will be cured by protecting the surface from the effects of sunshine and dry winds for a continuous period of twenty eight days or such period as may be directed by the Engineer. The protection will be applied as soon as the concrete becomes sufficiently hard, by covering with Hessian cloth or similar absorbent material, and keeping constantly wet.

7.1.15 Stockpiles of Blocks and local handling

Blocks will not be stockpiled or transported until they have been cured for at least 21 days. They should be stockpiled with consecutive numbers and in a measurable/countable stack. The stacks will not contain more than 6 layers and will not be stacked close to the riverbank.

The Contractor will organize the handling and transporting of blocks from the stack yard to each designated placing section for re-stacking, counting, photographing, video recording and recording in a register with a joint signature of representative of contractor, Engineer in charge of the sub-project and PMC and will make available all time for inspection and checking by authorised inspecting officials. All cost of stock piles of blocks, handling and transportation including loading unloading etc. from manufacturing plant to work site will be borne by the contractor.

7.1.16 Damaged Blocks

Blocks which are damaged during manufacturing, stockpiling, handling and transportation will be rejected and removed from the site immediately. The Contractor must supplement the damaged or rejected blocks at the Contractor's own cost. The contractor will maintain a separate register for damaged blocks mentioning the number, date & reason of rejection and date of removal with signature of representatives of contractor, Engineer in charge of the sub-project & PMC and will make the register available at all times for inspections and checking by the authorised inspecting officials.

7.1.17 Placing of Blocks

7.1.17.1 In preparing the base of the flood protection slope, some cutting and filling may be required. If excavated soil is of suitable quality (as verified by Engineer in charge of the sub-project by laboratory testing), it may be used as fill material along the riverbank slope. Any unsuitable excavated material must be removed from the site.

7.1.17.2 Placing of blocks on the slope of riverbank will start at its lowest elevation, just above Low Water Level, and proceed up the slope in horizontal layers towards the bank line crest, in a careful manner so as to avoid disturbance or damage. The lower row of CC Blocks will be grouted to the dumped blocks under water in order to secure the lower row against displacement.

7.1.17.3 Blocks will not be placed in the works until at least twenty-eight days after casting have elapsed or until the specified strength has been attained. CC Blocks will be laid by hand on the filter (geo-textile material and sand) in horizontal rows parallel to the direction of the flow. The blocks in each row will be staggered half a block width from those in the row below. Blocks in the same row and in adjacent rows will be densely laid with no gaps exceeding 10 mm.

7.1.17.4 The CC Blocks will be laid in a manner so as not to damage or displace the underlying geo-textile material and sand layer. Any damage caused to the filter during placing of the blocks will be repaired at the Contractor's own cost and to the satisfaction of the Engineer. The outer face of the placed riverbank protection above Lowest Low Water will have a smooth and even appearance.

7.1.17.5 CC Blocks to be used in the Works from any stack or stacks will be counted, at the beginning of each day's work, by the Engineer or his representative, and the numbers, together with the record of individual block numbers, recorded. After each day's work, any unplaced blocks in the counted stacks will be recounted and the net number of blocks used during the day will be recorded in a register. The Engineer, Consultant, and Contractor or their representatives will all sign the register every day after each day's work. Payment will be made for number of blocks placed after cross check of the area covered by the blocks.

7.1.18 Measurement and Payment

The Contractor will be paid for single layer of placed concrete block in slope by counting the blocks in numerical number. Whenever the layer thickness is exceeded, the contractor will assure smooth transitions of slope not more than 1:5. The costs associated with all transport preparation of concrete blocks describe in this section -6, technical specifications and elsewhere in the tender documents for due performance of the contract including all equipments, labour, supervision and ancillary / incidental costs are deemed to be in the relevant item of bill of quantities.

8. Preparation and Sewing of Geo-bags

The Employer will provide the required quantity of Geo bags and special Sewing thread to the contractor.

i. The Geo-textile bags will be prepared by sewing, the smaller transverse (top) side subsequent to filling.

ii. Sewing should be done by stitching machine.

iii. The number of stitches per inch should not be less than 5. The stitch will be double thread chain stitch type 102.

iv. At the end of each seam (at the folded side) the stitch will be locked either by stitching one time back and forth for length of minimum 2.5 cm from the end of the bag, or by joining the ends of the two threads e.g. by gluing, welding, knotting or other appropriate methods, acceptance to the engineer-in-charge of the sub- project.

v. The two lines of stitches will be within 3 mm distance with a margin of 2.5 cm from the edge of the Geo- Textile to the centerline between the two seams. The tolerance is 3 mm in each direction.

vi. Any deviation from the prescribed sewing is subject to acceptance of the engineer-in-charge of the sub- project after testing of sample.

9. Supplying of Galvanised steel wire netting sheet

Gabion of size 1.50 m X 1.50 m X 0.50 m will be manufactured from coated galvanized steel wire. The gabions will be double twisted mechanically woven hexagonal wire mesh type 10 X 12 (D=100). These gabions consist of double twisted wire mesh made from soft type wire which is heavily zinc coated. Galvanized steel wire will conform strictly to specification of IS: 16014-2012.

Specifications: Wire -netting box of size 1.50mx 1.50m x 0.45m made with mechanically woven, double twisted , hexagonal shaped wire mesh with wire made of low carbon, high ductile MS wire with heavy class of galvanization with an additional layer of PVC coating with mesh type of 10x12 as per EN 10223 & ASTM A975 , mesh wire of 2.70mm (I.D)/3.70mm(OD)tensile strength of 450-500/mm^2,edge wire/selvedge around it at least 2.5 times, lacing wire (zinc P.V.C. coated) of 2.20mm (I.D.) /3.20mm (O.D) P.V.C. coating thickness of 0.50mm nominal, 0.38mm minimum and with average weight per unit being 12 kg with additional 3% of the weight of box for lacing wire supplied separately, supporting the facing of the box with Zink coated steel wire of required length as directed, complying with A.S.TM and European norms, including payment of all duties, sale tax, any other taxes as applicable loading, unloading and staking them at the site of work in measurable stacks, complete as directed .

9.1 TESTS AND CHECKS

9.1.1 TENSILE STRENGTH

The tensile strength of wire used for mesh wire, edge/ selvedge wire and lacing wire, when tested will be in accordance with requirements of IS: 280 for soft wire 350-550 MPa at a minimum elongation of 10 percent, performed on a gauge length of test specimen as 200 mm. The diameter of wire in mm will be for mesh wire 2.70/3.70 (ID/ED), edge/selvedge wire 3.40/4.40(ID/ED) and lacing wire 2.20/3.20 (ID/ED) where internal diameter (ID) and external diameter (ED).

9.1.2 MESH STRENGTH

The minimum strength requirements of the mesh when tested will be 32.00 KN/m (minimum) parallel to twist and 15.50 KN/m (minimum) perpendiculars to twist.

9.1.3 ZINC COATING

The mass of Zinc coating will conform to the requirements of IS: 4826 heavily coated soft type and will be 240 gm /m2 for 2.2 mm dia wire, 260 gm /m2 for 2.7 mm dia wire wire , 270gm /m2 for 3.4m dia wire and 280gm/m2 for 3.90mm dia wire.

9.1.4 ADHESION OF ZINC COATING

The Zinc coating will remain adherent to the steel wire and conform to IS: 4826 such as Zinc coating does not flake of , nor crack to such as extent that there is possibility of removing any zinc by rubbing with fingers.

9.1.5 DIMENSION AND TOLERANCE

Mesh type of the gabions will be 10x12 and nominal size (D) will be 100 with tolerance plus 16 % to minus 4%. Sampling of test specimens determining properties cited above of double twisted galvanised wire mesh gabions, frequency of test and test method etc. will follow IS: 16014-2012.

Manufacturer's test certificate is acceptable provided test certificate originate from reputed independent testing organization/ institution/ laboratory. Test certificate will accompany with all consignments of galvanized steel wire gabion brought at site by contractor. The Engineer-in-charge will examine the galvanized steel wire gabion upon delivery to the site and report any deviation from above specification to the contractor. The Engineer –in –charge will collect a sample and the sample will be sent to an independent laboratory for conformation of test results. All costs related to tests will be borne by the contractor.

10. Supplying of Non-Woven Geo-Textile Fabric Sheet and Geo-Bag

10.1 The Bid will accompany by the following documents:

- **i.** Manufacturer's technical data sheet for the Geo-Textile Fabric Sheet to be used under this contract.
- **ii.** Manufacturer's quality statement conforming compliance with specifications in the event the bidder is awarded the contract.

A) Geo-textile bags of type-A (1.03 × 0.70M) inner to inner made of Geo-textile non-woven fabric sheets of 400 GSM manufactured from 100% virgin Polypropylene (PP) fibre with minimum properties as per **IS 16653: 2017**

- **i.** Wide Tensile strength (MD) ≥20KN/m & Wide Tensile strength (CD) ≥20 KN/m
- **ii.** Elongation (MD) ≥50% & Elongation (CD) ≥50%
- **iii.** Abrasion ≥95%
- **iv.** Trapezoidal Tear Strength (MD) ≥450N & Trapezoidal Tear Strength (CD) ≥450N CBR Puncture strength≥4000N
- **v.** Permittivity≥1.10s-1
- **vi.** Permeability≥40l/m2/sec
- **vii.** AOS ≤75micron
- **viii.** UV Resistance @500 hours retained Tensile strength (MD) & (CD) ≥ 80%
- **ix.** Mass≥400 gm/m²
- **x.** Thickness at 2 KPa≥3 mm

xi. Seam strength ≥80 % of actual fabric strength.

Stitching of Bags should be Ring Spun Yarn stitches with 2500-3000 denier double line chain stitch with overlap with stitches along the edge @ minimum 15 stitches per 100mm. (Bags are to be supplied of 100 numbers in a bundle, properly packed with each bag having proper tag with name of Manufacturer, Batch Number, the GSM and type of polymer encrypted and stitched on top corner and each bag is to be marked with "WRD Govt of ASSAM" to be printed distinctly. Test Certificate from approved NABL accredited and ISO (Certified Laboratory should invariably be submitted against each batch of material)

B)N-woven Geo-textile fabric sheets of 300 GSM manufactured from 100% virgin Polypropylene (PP) fibre with minimum properties as per **IS 16653: 2017**
(i) Wide Tensile strength (MD) ≥15KN/m &
Wide Tensile strength (CD) ≥15KN/m
(ii) Elongation (MD) ≥50% & Elongation (CD) ≥50%
(iii) Abrasion ≥95%
(iv) Trapezoidal Tear Strength (MD) ≥340 N & Trapezoidal Tear Strength (CD) ≥340 N
(v) CBR Puncture strength ≥3000 N
(vi) Permittivity ≥1.25 s-1
(vii)Permeability ≥60l/m2/sec
(viii)AOS ≤75micron
(ix)UV Resistance @500 hours retained Tensile strength (MD) & (CD) ≥80%
(x) Mass ≥ 300gm/m²
(xi)Thickness at 2KPa ≥3mm.

10.2 Quality of delivered material

10.2.1 Geo-Textile fabric in standard rolls used for the manufacture of Geo-bags or delivered as Geo-Textile Filter Sheets shall be clearly marked "WRD Govt of ASSAM"at regular intervals (minimum every square meter) with the product name and grade and production lot number. Marking every square meter is required to identify the supplier of the bags in later years. The Project accepts for example continuous marking with maximum 1 m distance, which provides all relevant information after cutting the Geo-Textile for sewing of bags. Alternatively, the Project accepts the common marking of the Geo-Textile sheets and in addition a label with all relevant information sewn into the side seam of each bag. Quality and size of the label should follow common garment standards and is subject to approval of the Purchaser.

10.2.2 Each roll of Geo-Textile fabric will be protected in a plastic foil wrapper, clearly labeled with the roll number, production lot number and description of the product, product name, grade and manufacture's details.

10.2.3 Each batch of Geo-Textile Filter Sheet and Geo-bag delivered to the site will be packed in standard numbers and marked with labels that identity the followings:

i) Brand and grade,
ii) Production lot number and date of production of Geo-Textile used to manufacture the sheet and bag.
iii) The running number of the roll of sheet and of the bags.
iv) the size and capacity of bags. (For Geo-bag)
v) Name and signature of the quality control person that certifies the compliance of the aforesaid specifications.

10.3 Acceptance / Rejection

10.3.1 Geo-Textile Filter sheets and Bags not meeting the requirements of the Technical Specifications will be rejected and not be delivered to the site or upon knowledge of defects, will be removed from the Site within two working days.

10.3.2 The engineer-in-charge of the sub-project will issue Receiving Certificates at the Site after receipt of the Geo-Textile Filter sheets and Bags, verifying the quantities and the completeness of all related test certificates and the compliance of the test certificates with the Technical Specifications. The Receiving Certificate qualifies the Contractor for payment in accordance with the payment schedule. This is to be recorded in site register duly singed.

10.3.3 Upon completion of the contract and before final acceptance by the engineer-in-charge of the sub-project the contractor will deliver complete documentation of all details related to the manufacturing, delivery processes adopted and all test results, including the documentation and delivery of Geo-Textile sheets , Geo-Bags and Sewing Thread in a format acceptable to the engineer-in-charge of the sub-project. After acceptance of this documentation by the engineer-in-charge, the engineer-in-charge will issue the Acceptance Certificate to the Contractor.

10.4 Quality Assurance Requirement

10.4.1 Before starting production of Geo-Textile Filter Sheets and Bags, the contractor will submit to the engineer-in-charge of the sub-project, a Quality Assurance Manual describing in details his quality assurance and control system being follow of with specific details about quality assurance processes in effect during the production process under this contract. Details of Manufacturer's quality assurance program will be submitted to the engineer-in-charge of the sub-project not later than two weeks after contract award for formal acceptance.

10.4.2 The contractor will submit test certificates separately for each consignment of Geo-Textile fabrics, and Sewing Thread and make them available before the consignment is ready for delivery. Tests lasting longer, such as UV tests, will be made available before issuance of Receiving Certificate at the Site in accordance with relevant clause.

10.5 Plant and Pre-Shipment Inspection

10.5.1 The Engineer-in-charge of the sub-project or any of his representatives will have the right to inspect the manufacturing plant(s) of Geo-Textile material at the beginning of the production process, during the production of the Geo-Textile fabrics and Geo-Bags to evidence the Manufacturer's quality assurance process, testing of materials and to confirm compliance with the specifications.

10.5.2 Any plant for manufacturing of Geo-Textile sheets and Geo-Bags will be made accessible to the engineer-in-charge of the sub-project or any of his representatives at any time without special notice. All cost of visit of engineer in charge or his representative and / or PMC representative will be borne by the employer / engineer in charge.

10.6 Frequency of Quality Control by the Manufacturer/Contractor:

10.6.1 The Contractor will undertake sampling and testing of all mechanical and hydraulic properties listed in the specifications in approved recognized & reputed laboratory at a frequency of not less than every 20,000 m^2 of Geo-Textile fabrics manufactured for the purpose of making Geo-Textile bags or Geo-Textile Filter Sheets, The related testing report will be submitted to the engineer in charge as results become available but latest before issuing the Receiving Certificate at the site.

10.6.2 (A) The Contractor will undertake sampling and testing to determine UV and abrasion resistance of the Geo- Textile Fabric in compliance with these specifications at every 100.000 m^2 of product manufactured. The related testing reports will be submitted to the engineer-in-charge of the sub-project, as results become available but latest before issuing the Receiving Certificate at the Site.

10.6.2 (B) The Contractor for the Geo-Textile bags shall undertake sampling and testing of the seams of the bag to ensure compliance with the specifications at a frequency of not less than one seam test per 10,000 bags, The related testing report will be submitted to the engineer in charge as results become available but latest before issuing the Receiving Certificate at the site

10.6.3 On being instructed to do so by the engineer-in-charge of the sub-project the contractor will take one approximately square sample of at least

i. 4 m^2 from each of two rolls
ii. four bags from different delivered lots for the purposes of a Control Test by the engineer in charge, and label them giving the following information.
    - Name of the project
    - Product name
    - Roll and lot number
    - Upper side (for installation purposes)
    - Date on which the sample was taken.

10.6.4 If Geo-Textile bags are supplied sewn at a factory, the samples must be taken from the seam area. The seam sample requires the full seam length of bags without cutting.

10.6.5 The sample will be sent through the engineer-in-charge of the sub-project or his representative to a testing laboratory decided by the engineer-in-charge of the sub-project .

10.6.6 A Control Test normally consists of the following individual tests:

i) Mass per unit area:
ii) Thickness:
i) Tensile strength at failure in longitudinal and transverse direction:
ii) Water permeability (velocity index for a head loss of 50 mm V_{H30}):
iii) Characteristic opening size,
iv) CBR, and
vii) abrasion test.

The costs of the control tests mentioned above will be borne by the contractor**.**

10.6.7 Manufacturer's test certificate is acceptable provided test certificate originate from reputed independent testing organization/ institution/ laboratory. Test certificate will accompany with all consignments of geo-textile fabric sheet brought at site by contractor. The Engineer-in-charge will examine the geo-textile fabric sheet upon delivery to the site and report any deviation from above specification to the contractor. The Engineer –in –charge will collect a sample and the sample will be sent to an independent laboratory for confirmation of test results. All costs related to tests will be borne by the contractor.

11. Geo-bag Protection Works – Filter- and Cover-Layer

Sand-filled geo-textile bags (geo-bags) are used for riverbank protection against hydrodynamic forces. The geo-bags will be filled with sand coarse enough to be retained by the geo-textile and It is important that the sand does not leak out over time. In addition, geo-bags must withstand loads resulting from filling, handling, transporting, and dumping.

11.1 Work Preparation

11.1.1 The bags will be transported to the project site for filling sand as per need at the site by the Contractor.

11.1.2 When the fabricated Geo-bags are brought to the site by the Contractor, they will be jointly counted by the Engineer, Consultant, and Contractor, or their representatives, and the total recorded in a register that is signed by all three parties. The original register is to be kept by the Engineer, and copies are to be kept by the Consultant and the Contractor.

11.1.3 At the Contractor's site, the Geo-bags are to be stored in an orderly manner, protected from ultra-violet radiation and other influences negatively affecting their material properties and in ventilated areas to the Engineer's satisfaction.

11.1.4 The Contractor will transport, handle and store all Geo-bags in full accordance with the Manufacturer/Supplier's instructions or as per instruction of the Engineer. Geo-bags will be kept wrapped in black polyester sheeting or any other suitable cover, to prevent ultra-violet exposure, until immediately before use in the Works. If the wrapping is damaged during handling, it will be repaired immediately by the Contractor using the same sheeting. Unused bags will be re-wrapped promptly.

11.1.5 Bags must be handled with care and not damaged. Any damaged bags will be replaced with bags of the same or higher material properties, and the same dimensions at the Contractor's own cost.

11.2 Sand-Excavation and Sand Quality

11.2.1 Sand for bag filling must be taken from approved areas (approved by Forest Department) of the river bed or chars and can only be used after acceptance from the Engineer's Representative. Sand Excavation at or near the Site is prohibited. Sand for the filling of the geobags will have to be washed and/or screened if necessary, to remove silts and other contaminants.

11.2.2 Sand will not contain more than 3% finer material than 0.074 mm grains when sieved through Sieve no. 200 ASTM or BIS equivalent and not more than 10% material finer than 0.1 mm, and must have a Fineness Modulus (FM) of greater than 1. A minimum of 1 sample will be tested from every 500 m^3 of sand supplied to the Site or screened.

11.2.3 Sand will be stockpiled in distinct heaps not exceeding 2000 m^3 volume. Once a heap has been sampled, tested and is accepted by the Engineer, the sand can be used for filling bags. Sand not accepted, or heaps replenished after checking, will not be used.

11.2.4 The sand fill for the bags is subject to inspection and acceptance by the Engineer. The Contractor will supply the necessary laboratory equipment, including three sets of sieves, weighing scale, etc., and labour. A minimum of 3 samples will be tested from every 500 m^3 of sand stored at the site. The average of all samples taken from one stockpile must not contain more than 3 percent of silt (which is defined as a grain size below 0.074 mm) with each individual sample not exceeding 5%. The Contractor will carry out the sieve tests in the presence of the Engineer's Representative and hand over the results immediately upon completion.

11.3 Geo-bag Filling

11.3.1 Filling of bags will take place in appropriate areas, clean and free from flooding, wave action, or threat of erosion. The Contractor has to provide space for filling at least three times the daily average filling rate. This rate is defined as total number of bags divided by the number of days programmed in the Contractors work methodology for filling, or as a maximum, the contract period minus a three week mobilization time.

The bags must be filled to obtain the dry weight as per the following table:

Dimension A (Length, m)	Dimension B (Width, m)	Weight (kg)
1.03	0.70	126

11.3.2 Some variations in weight after filling, due to deviations in volumetric weight and water content of the sand, and variations in closing the bags, will be tolerated but must be in accordance with the design concept. A joint verification by the Contractor and the Engineer or his Representative of the practical requirements and the resulting weight tolerances will take place prior to mass production. Filled bags will be checked for weight at random throughout the construction period at the frequency of one bag per 1,000 filled. If a sample is found to be less than that specified, then the

whole batch from which it was taken will be checked and any under- weight bags will be opened and filled to the correct weight. The Contractor will provide all laboratory and testing equipment including weighing scales of minimum 200 kg capacity at every filling area, manpower, etc., to undertake the necessary checks and tests. Bags will be held by appropriate means at their upper end in straight positions during filling. The filling must be done in an orderly manner following a pre-determined sequence.

11.4 Sewing – Closing of Geobags after Filling

The sewing thread for the closing of the Geo bags will be supplied by the employer to the contractor.

11.4.1 The bags will be closed by two lines of stitching. The stitching will be a 'staple' or 'prayer' seam with double chain stitch, type 102, according to ISO 4915. The stitch count will be fixed through tests at the site and will be between 4 to 7 stitches per inch. The stitches will be placed a minimum of 2 cm, but not more than 2.5 cm from the top of the bags and minimum 3 mm apart. The ends of the first seam must be secured by a second arch shaped seam crossing the first near the ends.

11.4.2 Any deviation from the above mentioned technical specifications needs written approval by the Engineer and must be established through sufficient evidence based on laboratory and field testing.

11.4.3 The number of electric hand held sewing machines of standard quality at the site must be a minimum of 1.25 times the daily average filling rate (as defined above), divided by the number of bags stitched on average per day per machine. The Contractor will make arrangement for regular maintenance and servicing of sewing machines in order to keep down times to a minimum. All sewing machines out of operation must be removed from the site.

11.5 Handling and Transport to the Dumping Equipment

11.5.1 After filling and sewing, the bags must be stockpiled ready for counting. After stockpiling a certain number of bags, and immediately prior to commencing transported to the dumping site, the bags will be counted jointly by the Engineer, Consultant and Contractor, or their representatives. The result will be entered in a register and signed by all three parties.

11.5.2 Filled bags will be loaded on flat top barges or engine driven flat top country boats and transported to the dumping barge/pontoons, where they will be stacked in an orderly manner.

11.5.3 During the loading, transport, unloading and dumping processes, the bags will be lifted and handled with care, without over stretching the geo-textile, puncturing the bags, destroying the seams or causing any other defect which will reduce the quality of the bag as a protective element.

11.5.4 Sufficient care must be taken not to lose bags during the loading, transport, unloading and stacking processes, especially in rough weather conditions. Any bags that are inadvertently dumped before the counting operation is complete are to be omitted from the count and replaced at the Contractor's own cost.

11.5.5 Any dumping aid, used to prevent displacement of bags in strong currents, will not have any sharp corners or edges or any other features that could damage the bags or reduce their material properties, making them unsuitable for their designed purpose.

11.6 Preparation of anchor arrangements

11.6.1 The Contractor will start preparation for anchoring of barge/pontoon immediately after mobilization.

Preparatory works will focus on the identification and establishment of anchor points on the floodplain. Anchor points must be free from flooding and protected against wave erosion. Sufficiently strong anchors, piles, bollards and winches must be used and safely installed.

11.6.2 All hired barges/pontoons, winches, wire ropes, etc. used for the purpose of anchor barges must be structurally sound and safe. The Contractor will check and if necessary reinforce the barges/ pontoons for his purposes in compliance with Indian maritime safety regulations. After any accidents or whenever doubts arise about the structural soundness of any equipment, or upon the written request of the Engineer or his Representative, the Contractor will provide all calculations, drawings, work descriptions, etc. supported, if necessary, by certificates from a naval architect and/or acknowledged institution, to support the Contractor's claim of the equipment's structural integrity.

11.6.3 The anchor arrangement and the concept of dumping barges/pontoons placing must be designed for the secure fastening of barges/pontoons during the dumping process, allowing the barges/pontoons to shift according to site progress or other requirements related to the works, or for external reasons. The entire dumping arrangement must comply with all Indian land and water safety standards. The Contractor is responsible for obtaining all the required permissions from relevant authorities.

11.6.4 The Contractor will provide all equipment, installations manpower, machinery, spare parts, etc. necessary to operate and maintain the anchor pontoons and land based arrangements during the whole duration of the works.

11.6.5 All anchor points must be equipped with sufficiently strong, fixed and movable anchor arrangements, such as bollards and winches of sufficient power to hold the envisaged barges/pontoons at fixed locations in the river during all flow conditions.

11.7 Dumping Aids

11.7.1 The Contractor will ensure that his dumping methodology works in all anticipated river currents, in particular strong river currents expected along certain reaches, and that the bags are dumped in the required locations forming a uniform coverage of the underwater area. This may require dumping aids to be used in some locations with strong currents or tidal influence.

11.7.2 Dumping aids could consist of flexible installations whose objective is to reduce the flow velocities under the dumping barges/pontoons and thus the displacement of dumped bags. Alternatively, the dumping aids may guide the bags to the bottom of the river by reducing the impact of river currents.

Dumping aids could lead to increased loads on the anchor arrangements of the dumping pontoon the effect of which must be taken into account when designing the anchor concept.

11.8 Dumping of Bags under Water

11.8.1 Bags will be dumped below Lowest Low Water to form permanent protection and/or a filter layer under subsequently dumped or placed cover layers. The dumping will start at the riverside end of the falling apron and then move upward over the bank towards Lowest Low Water. If necessary result of dumping of geo-bag in a reach of 500m or so will be executed & checked by Engineer in charge of the sub-project before hand and expenditure will be meet up from provisional sum.

11.8.2 Dumping will only be permitted from barges/pontoons, which are correctly anchored at the required locations which have been accurately verified by survey equipment such as a Total Station or DGPS. Dumping from equipment not properly anchored will not be allowed.

11.8.3 All dumping will take place in the presence of the Engineer, Consultant and Contactor, or their representatives. After positioning of the dumping pontoon, bags will be placed on the dumping barges/pontoons, and then stacked in individual predefined column configurations, marked at every meter along the front edge of the barges/pontoons. The bags in each stack and the number of stacks in the row must be separately counted and duly recorded in a register by the Engineer, Consultant and Contactor, or their representatives, who will be stationed on the barges/pontoons, before the bags can be dumped.

11.8.4 As an independent check, the stacking procedure forms part of the video recording of all dumping operations. After the counting has been completed and recorded, the supervisor will give the dumping order. The process of dumping will be recorded on film as well, producing a continuous record of placed bags ready for dumping and all dumping operation for each sequence or line of dumping.

11.8.5 The total number of bags in each dumping operation is to be entered into an individual registry by the supervisors. The registry is to be duly signed and handed over to the Engineer after each day of dumping. Besides the number of bags, details about the location of the barges/pontoons, date and time, number of labour employed, use of dumping aids, etc. are also to be recorded, for each dumping operation.

11.8.6 The Contractor will provide a portable open shed along the riverbank for the Total Station and its operator and supervisor with 2 wooden chairs, 1 small table, and 1 umbrella to facilitate the supervision of dumping of geo-bags by accurate positioning of the pontoon and the counting and recording of the number of geo-bags being dumped.

11.8.7 The work will follow the implementation methods suggested by the Contractor and pproved by the Engineer. Any change of the Contractor's methodology requires the written permission of the Engineer.

11.8.8 The Contractor will check that the dumping results in the required and proper coverage under water using the post-work bathymetric survey and the diving inspections. Areas with improper

coverage of bags or any gaps will be filled with bags to achieve the design thickness, through additional dumping.

11.9 Tolerances

11.9.1 Bag filling, based on volumetric measurement, will be tolerant to deviations of the volumetric weight of sand. An average dry density of 1500 kg / m^3 has been used for the design and is expected for sand delivered to the site. Any significant deviations require prior approval from the Engineer.

11.9.2 Before starting the dumping activities, the Engineer and Contractor will jointly define and agree on a practical method to determine the layer thickness of dumped bags. This will likely include a combination of bag counting, pre and post-work surveys, and diving investigations.

11.9.3 The design thickness of Geo-bags dumped below Low Water Level will be achieved over at least 95% of the coverage area, and nowhere will the coverage thickness be less than 95% of that shown on the drawings.

11.10 Fabrication of WN Box for Toe Key

WN Box can be fabricated near the project site or may be supplied after proper approval,

11.11 Placing Galvanized Wire Mesh Gabion

Laying Galvanized WN box filled with Geo Bag will be executed at transition point in toe key over a filter layer of geo-textile sheet on firm bank ground after necessary excavation for adequate support of slope pitching work. Top of toe key will be flushed with top of slope pitching at its lowest point. Contractor will assure satisfactory and acceptable support of slope pitching work by placing toe key in proper position.

11.12 Placing of Cement Concrete Block (Dimension 0.3m x 0.3m 0.3m)

After trimming of the river side slope, Geo fabric sheet has to be laid over filter media and anchored by the top key. regular slope as specified should me maintain by the contractor and CC block should be placed keeping less space in between.

11.14 Photography, Video Recording, Entering into the Register, and Reporting

11.14.1 Primary quality control processes will be maintained by continuously counting Crates and Geo- bags, performing pre and post-work surveys, and through diving investigations, as detailed in previous sections.

11.14.2 However, since the controlled dumping of Geo-bags are done underwater and cannot be accurately verified after work completion, a comprehensive system of photography and video recording will be performed during each dumping operation. For each sequence of works, as defined by specific work sections or intervals, this will comprise the following, with the use of the location stakes specified in 5.3 above, in the presence of Engineer, Consultant and Contractor, or their representatives:

11.14.3 After filling, stockpiling and counting the Geo-bags, the Contractor is to spray paint them, and then photograph and video record the geo-bags along with the location stake, date and time.

11.14.4 After the bags have been properly stacked on the dumping pontoon and all counting operations have been completed, the Contractor is to provide a continuous photograph and video record of the entire dumping operation until all bags or cubes have been dumped.

11.14.5 The photographs and video recording should be done from the land using a tripod, and with a complete view of the entire dumping operation. Both the date and time must be displayed on all photographs and video recordings.

11.14.6 At the end of each day, the Contractor will submit all photographs and video recordings, which will be attached to the site register book. The photographs and video recordings will be certified in the register book by the Engineer, Consultant and Contractor, or their representatives. Any dumping operations that do not have certified photographs and video recordings in the register book will be deemed as not completed.

11.15 Measurements and Payment

The quantities placed will be recorded as described above.

11.15.1 Geobags will be placed in accordance with the agreed number of bags per layer multiplied by the slope width protected. Additionally, 5% excess volume will be available for dumping geobags to fill gaps. Additional requirements are to at the expense of the Contractor. The additional geobags can either be supplied from available contingency quantities by the Employer and the procurement cost deducted from the Contractor's bills or supplied by the Contractor supported by consistent test certificates in line with the procurement contract for geobags. The volume of dumped geobags will be compared with the number of geobags delivered to the Contractor, the number of geobags filled, the amount of sand stockpiled and accepted, and the video recordings. The Contractor will provide the comparison of quantities for the checking through the Engineer with each invoice.

11.15.2 The number of executed cc block will be compared with the number of cc block delivered to the Site and accepted and the video recordings. The Contractor will provide the comparison of quantities for the checking through the Engineer with each invoice.

11.15.3 The costs associated with all transport, preparation, and dumping of geobags for filter placement of crates/gabions, described in this Section, Technical Specifications, and elsewhere in the tender documents, for the due performance of the Contract, including all equipment, labour, supervision, and ancillary costs are deemed to be included in the relevant item of the Bill of Quantities.

12. Wave Protection above Low Water

12.1 Preparation of Bank Slope above Water and Toe

12.1.1 All riverbank protection above water will be placed on even and smooth ground. The surface of cut areas will be compacted before placing the filter consisting of sand, and geo-textile material.

12.1.2 Based on the results of the pre-work survey contours and cross-sections of the flood plain and riverbank, the design drawing will be adjusted for excavation of the bank slope above Lowest Low Water.

12.1.3 The portion of slope above the Low Water Level will be excavated as per the drawing and excavation will be carried out to the lines, levels and profiles shown on the drawings. The Contractor will carry out excavation in a way to minimize disturbances to the surrounding grounds. Particular care will be taken to maintain stability when excavating in close proximity of existing protection. Excavated material will be disposed of or may be incorporated into the works either directly or after stockpiling as stipulated in the Bill of Quantities or otherwise directed by the Site Engineer. Only those materials meeting the appropriate technical specification may be incorporated into the permanent works.

12.1.4 The Contractor will remove unsuitable material from the site as ordered or agreed by the Engineer.

Cost for removal of such material will be borne by the Contractor.

12.1.5 Excavated and filled levels along the slope of the riverbank above Lowest Low Water will be within a tolerance of ± 5 cm, with cross-sections taken at 10 m interval spacing. If for any reason whatsoever excavations were carried out by the Contractor beyond permissible tolerances, the Contractor will, at his own cost, make them good to the required lines and levels with compacted sand or other approved material.

12.2 Filling Works

12.2.1 Filling works comprise of filling and compaction of any land, construction of dyke, filling and compacting of construction pits and excavations, back filling of structures to design levels.

12.2.2 Fill and backfill material will be free from all organic and otherwise undesirable material and be approved by the Engineer/Resident Engineer.

12.2.3 Fill materials should be placed in layers of 150 mm and compacted by mechanical equipment to attain 85% maximum dry density at optimum moisture content with reference to laboratory density AASHTO- 180 or equivalent BIS, modified hammer in all kinds of soil.

12.2.4 Fill areas will be properly protected to achieve a degree of density of the surrounding area or bank. Any settlement of the protective layer during the first flood season and within the defects liability period (365 days after construction completion) will be remedied at the Contractor's own cost.

13. Geo-textile Filter Specifications and Construction Details

13.1 Storage and Handling

13.1.1 Geo-textile fabrics will be procured by the contractor. Geo-textile fabrics arriving at the site will be stored under cover, well sheltered from direct sunlight, until required for use in the Works. Sufficient ventilation under the shelter will be provided so as to minimize the effects of high temperature thermo- oxidation.

13.1.2 Geo-textile will be kept wrapped in coloured polyethylene sheeting to prevent Ultra-violet exposure until immediately before use in the Works. If the wrapping is damaged during handling it should be repaired immediately by the Contractor using additional coloured polyethylene sheeting.

13.1.3 Unused portions of material will be re-wrapped promptly. Geo-textile damaged due to handling or during installation in the Works is to be repaired immediately by the Contractor as per the manufacturer's instructions and to the Engineer's satisfaction, all at the Contractor's expense.

13.2 Sewing

13.2.1 To limit the number of over-laps between individual sheets of geo-textile filter at least three sheets are to be joined to make larger filter mats (factory standard width is approximately 4 m). Joining of geo- textile filter mats should be carried out at site. Stitching (double) will be done before placement or after placement to the satisfaction of the Engineer. The minimum overlap width between different sheets should be 35 cm. Electric powered, hand-held sewing machine will be used by the Contractor for the Works.

13.2.2 Thread should be polypropylene which the contractor will procure. The type of stitching will be two parallel lines of lock stitch (type 302). The seam will be "Staple" or "Prayer" and will have strength of a minimum of 90% of the specified strength of the geo-textile filter material (or 18kN/m). The Contractor will undertake testing of the seams by an approved recognized material testing institute at a frequency of one test for every 10 sheets joint, at the cost of the Contractor. The Engineer reserves the right to order additional tests at the cost of the Contractor.

13.3 Placing of Geo-textile Filter Cloth

13.3.1 The material will not be torn or punctured or otherwise damaged. If, during the course of work, damage to the geo-textile filter mats is encountered, remedial work will be carried out by the Contractor as per direction of the Engineer.

13.3.2 The geo-textile material must extend all the way from the Lowest Low Water with an extended 1.0 m beyond the placed CC blocks on the riverside to approximately 0.9 m beyond the bankline crest and embedded 0.5 m into the floodplain as indicated in the Drawings.

13.3.3 When laying the geo-textile, the slope surface should be a smooth plane, free from obstructions, humps, depressions and soft pockets of materials. All vegetation, tree stumps and brush wood must be removed and any depressions must be filled with compacted material.

13.3.4 Geo-textile material with a minimum of 35 cm overlaps or stitched together as specified above will be arranged down the slope, moving from downstream to the upstream so the upstream sheet overlays the previously placed downstream sheet. Temporary, free ends of the laid geo-textiles will be secured by ballasting with CC Blocks or sand filled Geo-bags, and, geo-textile will be nailed if necessary to the subsoil.

13.3.5 The geo-textile sheets are to be laid on top of a 10 cm thick layer of sand. CC Blocks are to be placed as soon as possible, but within two days of placing the filter materials (sand, geo-textile material). When geo-textiles are installed on a slope, the placing of CC Blocks will start at its lowest elevation, just above Low Water Level, and proceed up the slope during installation of geo-textiles no high stresses will be exerted on the geo-textile material and care is to be taken to ensure that the geo-textile material is not punctured by any sharp edges.

13.3.6 Stock piles of materials will not be placed on top of the laid geo-textile. No construction equipment will work on the geo-textiles without at least 300 mm of suitable materials overlying the geo-textiles. Smoking and any fires around the geo-textile works is strictly prohibited.

13.4 Placement of CC Block (Pitching)

13.4.1 The Contractor will place the cc block tightly interlocked to the specified thickness starting from the water line and ending at the floodplain.

13.4.2 During the placement process the cc block will not be dropped from a height or rolled down the geotextile filter cloth. Any damages to the geotextile filter cloth will be repaired at the Contractor's cost.

13.5 Measurements and Payment

13.5.1 The volume of wave protection placed will be established through the comparison of pre- and post- work survey. The survey of the final placed geobag layer will be conducted jointly with the Engineer. Not only the highest points of the placed wave protection layer will be surveyed but the average thickness in also taking survey points between geobags.

13.5.2 The Contractor will be paid for on average two layers of dumped geobags. Additional quantities required for remedies, such as dumping into gaps will be paid as per quantity required to achieve the theoretical thickness/quantities. Additional quantities required to cover losses or for filling of depressions will not be paid. The Contractor can either use these quantities from the Employer's stockpile with the procurement cost deducted from his instalment payments, or procure geobags from his own sources, duly respecting the specifications.

13.5.3 The number of dumped geobag will be compared with the number of geobag delivered to the Site and accepted, the number of geobag stockpiled onto the barge / pontoon, and the video

recordings. The Contractor will provide the comparison of quantities for the checking through the Engineer with each invoice.

14. Embankment Construction

14.1 General

14.1.1 Description: These Specifications shall apply to the construction of embankments including subgrades, earthen shoulders and miscellaneous backfills with approved material obtained from roadway and drain excavation, borrow pits or other sources. All embankments, subgrades, earthen shoulders and miscellaneous backfills shall be constructed 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.

14.2 Materials and General Requirements

14.2.1 Physical requirements:

14.2.1.1 The materials used in embankments, subgrades, earthen shoulders and miscellaneous backfills shall be soil, moorum, gravel, a mixture of these or any other material approved by the Engineer. Such materials shall be free of logs, stumps, roots, rubbish or any other ingredient likely to deteriorate or affect the stability of the embankment/ subgrade

The following types of material shall be considered unsuitable for embankment:

(a) Materials from swamps, marshes and bogs;
(b) Peat, log, stump and perishable material: any soil that, classifies as OL, OI, OH or Pt in accordance with IS : 1498;
(c) Materials susceptible to spontaneous combustion;
(d) Materials in a frozen condition;
(e) Clay having liquid limit exceeding 70 and plasticity index exceeding 45; and
(f) Materials with sails resulting in leaching in the embankment.

Ordinarily, only the materials satisfying the density requirements given in Table 300*1 shall be employed for the construction of the embankment and the sub-grade.

TABLE 300-1.
DENSITY REQUIREMENTS OF EMBANKMENT MATERIALS

S. No,	Type of Work	Maximum laboratory dry unit weight when tested as per IS: 2720 (Part 8)
1.	Embankments up to 3 metres 15.2 kN/cu.m. height, not subjected to extensive flooding,	Not less than

2.	Embankments exceeding 3 kN/cu. m. metres height or embankments of any height subject to long periods of inundation	Not less than 16.0

Notes:

(1) This Table is not applicable for lightweight fill material e.g. cinder, fly ash etc.

(2) The Engineer may relax these requirements at his discretion taking into account the availability of materials for construction and other relevant factors.

(3) The material to be used in sub grade should also satisfy design CBR at the dry unit weight applicable as per Table 30Q-Z

14.2.2 General requirements:

14.2.2.1 The materials for embankment shall be obtained from approved sources with preference given to materials becoming available from nearby roadway excavation or any other excavation under the same Contract. The work shall be so planned and executed that the best available materials are saved for the subgrade and the embankment portion just below the subgrade.

14.2.2.2 Borrow materials : Where the materials are to be obtained from designated borrow areas, the location, size and shape of these areas shall be as indicated by the Engineer and the same shall not be opened without his written permission. Where specific borrow areas are not designated by the Employer/the Engineer, arrangement for locating the source of supply of material for embankment and subgrade as well as compliance to environmental requirements in respect of excavation and borrow areas as stipulated, from time to time by the Ministry of Environment and Forests, Government of India and the local bodies, as applicable, shall be the sole responsibility of the Contractor, Borrow pits along the road shall be discouraged. If permitted by the Engineer, these shall not be dug continuously. Ridges of not less than 8 m width should be left at intervals not exceeding 300 m. Small drains shall be cut through the ridges to facilitate drainage. The depth of the pits shall be so regulated that their bottom does not cut an imaginary line having a slope of 1 vertical to 4 horizontal projected from the edge of the final section of the bank, the maximum depth in any case being limited-to 1.5 m. Also, no pit shall be dug within the offset width from the toe of the embankment required as per the consideration of stability with a minimum width of 10 m. Haulage of material to embankments or other areas of fill shall proceed only when sufficient spreading and compaction plant is operating at the place of deposition. No excavated acceptable material other than surplus to requirements of the Contract shall be removed-from the site. Should the Contractor be permitted to remove acceptable material from the site to suit his operational procedure, then he shall make good any consequent deficit of material arising there from. Where the excavation reveals a combination of acceptable and unacceptable materials, the Contractor shall, unless otherwise agreed by the Engineer, carry out the excavation in such a manner that the acceptable materials are excavated separately for use in the permanent works without contamination by the unacceptable materials. The acceptable materials shall be stockpiled separately. The Contractor shall ensure that he does not adversely affect the stability of excavation or fills by the methods of stockpiling materials, use of plants or siting of temporary buildings or structures. The Contractor shall obtain representative samples from each of the identified borrow

areas and have these tested at the site laboratory following a testing programme approved by the Engineer. It shall be ensured that the subgrade material when compacted to the density requirements as in Table 300-2 shall yield the design CBR value of the subgrade.

TABLE 300-2.
COMPACTION REQUIREMENTS FOR EMBANKMENT

Type of work/ material	Relative compaction *as* percentage of max. laboratory dry density *as* per IS: 2720 (Part g)
1. Embankment	Not less than 95

The Contractor shall at least 7 working days before commencement of compaction submit the following to the Engineer for approval:

(i) The values of maximum dry density and optimum moisture content obtained in accordance with IS: 2720 (Part 7) or (Part 8), as the case may be, appropriate for each of the fill materials he intends to use.

(ii) A graph of density plotted against moisture content from which each of the values in (i) above of maximum dry density and optimum moisture content were determined.

(iii) The Dry density-moisture content -CBR relationships for light, intermediate and heavy compactive efforts (light corresponding to IS: 2720 (Part 7), heavy corresponding to IS: 2720 (Part 8) and intermediate in- between the two) for each of the fill materials he intends to use in the subgrade.

Once the above information has been approved by the Engineer, it shall form the basis for compaction.

14.2.3 Construction Operations

14.2.3.1 Setting out : After the site has been cleared to Clause 201, the work shall be set out to Clause 301.3.1, The limits of embankment/subgrade shall be marked by fixing batter pegs on both sides at regular intervals as guides before commencing the earthwork. The embankment/subgrade shall be built sufficiently wider than the design dimension so that surplus material may be trimmed, ensuring that the remaining material is to the desired density and in position specified and conforms to the specified side slopes.

14.2.3.2 Dewatering : If the foundation of the embankment is in an area with stagnant water, and in the opinion of the Engineer it is feasible to remove it, the same shall be removed by

bailing out or pumping, as directed by the Engineer and the area of the embankment foundation shall be kept dry. Care shall be taken to discharge the drained water so as not to cause damage to the works, crops or any other property. Due to any negligence on the part of the Contractor, if any such damage is caused, it shall be the sole responsibility of the Contractor to repair/restore it to original condition or compensate the damage at his own cost. If the embankment is to be constructed under water, Clause 305.4.6 shall apply.

14.2.3.3 Stripping and storing topsoil : In localities where most of the available embankment materials are not conducive to plant growth, or when so directed by the Engineer, the topsoil from all areas of cutting and from all areas to be covered by embankment foundation shall be stripped to specified depths not exceeding 150 mm and stored in stockpiles of height not exceeding 2 m for covering embankment slopes, cut slopes and other disturbed areas where re-vegetation is desired. Topsoil shall not be unnecessarily trafficked either before stripping or when in a stockpile. Stockpiles shall not be surcharged or otherwise loaded and multiple handling shall be kept to a minimum.

14.2.4 Compacting ground supporting embankment/subgrade:

14.2.4.1 Where necessary, the original ground shall be levelled to facilitate placement of first layer of embankment, scarified, mixed with water and then compacted by rolling so as to achieve minimum dry density as given in Table 300-2.In case where the difference between the subgrade level (top of the subgrade on which pavement rests) and ground level is less than 0.5 m and the ground does not have 97 per cent relative compaction with respect to the dry density as given in Table 300-2, the ground shall be loosened upto a level 0.5 m below the subgrade level, watered and compacted in layers in accordance with Clauses 305.3,5 and 305.3.6 to not less than 97 per cent of dry density as given in Table 300-2. Where so directed by the Engineer, any unsuitable material occurring in the embankment foundation shall be removed and replaced by approved materials laid in layers to the required degree of compaction. Embankment or subgrade work shall not proceed until the foundations for embankment/subgrade have been inspected by the Engineer for satisfactory condition and approved. Any foundation treatment specified for embankments especially high embankments, resting on suspect foundations as revealed by borehole logs shall be carried out in a manner and to the depth as desired by the Engineer. Where the ground on which an embankment is to be built has any of the material types (a) to (f) in Clause 305.2.1, at least 500 mm of such material must be removed and replaced by acceptable fill material before embankment construction commences.

14.2.5 Spreading material in layers and bringing to appropriate moisture content

14.2.5.1 The embankment and subgrade material shall be spread in layers of uniform thickness not exceeding 200 mm compacted thickness over the entire width of embankment by mechanical means, finished by a motor grader and compacted as per Clause 305.3.6. The motor grader blade shall have hydraulic control suitable for initial adjustment and maintain the same so as to achieve the specific slope and grade. Successive layers shall not be p laced until the layer under construction has been thoroughly compacted to the specified requirements as in Table 300-2 and got approved by the Engineer. Each compacted layer shall be finished parallel to the final cross-section of the embankment.

14.2.5.2 Moisture content of the material shall be checked at the site of placement prior to commencement of compaction; if found to be out of agreed limits, the same shall be made good. Where water is required to be added in such constructions, water shall be sprinkled from a water tanker fitted with sprinkler capable of applying water uniformly with a controllable rate of flow to variable widths of surface but without any flooding. The water shall be added uniformly and thoroughly mixed in soil by blading, discing or harrowing until a uniform moisture content is obtained throughout the depth of the layer. If the material delivered to the roadbed is too wet, it shall be dried, by aeration and exposure to the sun. till the moisture content is acceptable for compaction. Should circumstances arise, where owing to wet weather, the moisture content cannot be reduced to the required amount by the above procedure, compaction work shall be suspended. Moisture content of each layer of soil shall be checked in accordance with IS: 2720 (Part 2), and unless otherwise mentioned, shall be so adjusted, making due allowance for evaporation losses, that at the time of compaction it is in the range of 1 per cent above to 2 per cent below the optimum moisture content determined in accordance with IS:2720 (Part 7) or IS:2720 (Part 8) as the case may be. Expansive clays shall, however, be compacted at moisture content corresponding to the specified dry density, but on the wet side of the optimum moisture content obtained from the laboratory compaction curve. After adding the required amount of water, the soil shall be processed by means of graders, harrows, rotary mixers or as otherwise approved by the Engineer until the layer is uniformly wet. Clods or hard lumps of earth shall be broken to have a maximum size of 75 mm when being placed in the embankment and a maximum size of 50 mm when being placed in the subgrade.

14.2.5.3 Embankment and other areas of fill shall, unless otherwise required in the Contract or permitted by the Engineer, be constructed evenly over their full width and their fullest possible extent and the Contractor shall control and direct construction plant and other vehicular traffic uniformly over them. Damage by construction plant and other vehicular traffic shall be made good by the Contractor with material having the same characteristics and strength as the material had before it was damaged. Embankments and other areas of unsupported fills shall not be constructed with steeper side slopes, or to greater widths than those shown in the Contract, except to permit adequate compaction at the edges before trimming back, or to obtain the final profile following any settlement of th e fill and the underlying material. Whenever fill is to be deposited against the face of a natural slope, or sloping earthworks face including embankments, cuttings, other fills and excavations steeper than 1 vertical on 4 horizontal, such faces shall be benched as per Clause 305.4.1 immediately before placing the subsequent fill. All permanent faces of side slopes of embankments and other areas of fill formed shall, subsequent to any trimming operations, be reworked and sealed to the satisfaction of the Engineer by tracking a tracked vehicle, considered suitable by the Engineer, on the slope or any other method approved by the Engineer.

14.2.5.4 Compaction: Only the compaction equipment approved by the Engineer shall be employed to compact the different material types encountered during construction. Smooth wheeled, vibratory, pneumatic tyred, sheepsfoot or pad foot rollers, etc. of suitable size and capacity as approved by the Engineer shall bt used for the different types and grades of materials required to be compacted either individually or in suitable combinations. The compaction shall be done with the help of vibratory roller of 80 to 100 kN static weight with plain or pad foot drum or heavy pneumatic tyred roller of adequate capacity capable of achieving

required compaction. The Contractor shall demonstrate the efficacy of the equipment he intends to use by carrying out compaction trials. The procedure to be adopted for these site trials shall first be submitted to the Engineer for approval. Earthmoving plant shall not be accepted as compaction equipment nor shall the use of a lighter category of plant to provide any preliminary compaction to assist the use of heavier plant be taken into account. Each layer of the material shall be thoroughly compacted to the densities specified in Table 300-2. Subsequent layers shall be placed only after the finished layer has been tested according to Clause 903.2.2 and accepted by the Engineer. The Engineer may permit measurement, of field dry density by a nuclear moisture/density gauge used in accordance with agreed procedure and the gauge is calibrated to provide results identical to that obtained from tests in accordance with IS: 2720 (Part 28), A record of the same shall be maintained by the Contractor. When density measurements reveal any soft areas in the embankment/ subgrade/earthen shoulders, further compaction shall be carried out as directed by the Engineer. If inspite of that the specified compaction is not achieved, the material in the soft areas shall be removed and replaced by approved material, compacted to the density requirements and satisfaction of the
Engineer.

14.2.5.5 Drainage : The surface of the embankment/subgrade at all times during construction shall be maintained at such a cross fall (not flatter than that required for effective drainage of an earthen surface) as will shed water and prevent ponding.

14.2.6 Repairing of damages caused by rain/spillage of water:

14.2.6.1 The soil in the affected portion shall be removed in such areas as directed by the Engineer before next layer is laid and refilled in layers and compacted using appropriate mechanical means such as small vibratory roller, plate compactor or power rammer to achieve the required density in accordance with Clause
305.3.6. If the cut is not sufficiently wide for use of required mechanical means for compaction, the same shall be widened suitably to permit their use for proper compaction. Tests shall be carried out as directed by the Engineer to ascertain the density requirements of the repaired area. The work of repairing the damages including widening of the cut, if any, shall be carried out by the Contractor at his own cost, including the arranging of machinery/equipment for the purpose.

14.2.6.2 Finishing operations: Finishing operations shall include the work of shaping and dressing the shoulders/verge/roadbed and side slopes to conform to the alignment, levels, cross-sections and dimensions shown on the drawings or as directed by the Engineer subject to .the surface tolerance described in Clause
902. Both the upper and lower ends of the side slopes shall be rounded off to improve appearance and to merge the embankment with the adjacent terrain. The topsoil, removed and conserved carrier (Clause
301.3.2 and 305,3,3) shall be spread over the fill slopes as per directions of the Engineer to facilitate the growth of vegetation. Slopes shall be roughened and moistened slightly prior to the application of the topsoil
in order to provide satisfactory bond. The depth of the topsoil shall be sufficient to sustain plant growth, the usual thickness being from 75 rnm to 150 mm Where directed, the slopes shall be turfed wi th sods in accordance with Clause 307. If seeding and mulching of slopes is prescribed, this shall be done to the requirement of Clause 30S,When earthwork operations

have been substantially completed, the road area shall be cleared of all debris, and ugly scars in the construction area responsible for objectionable appearance eliminated,

14.2.7 Construction of Embankment under Special Conditions

14.2.7.1 Embankment and subgrade around structures : To avoid interference with the construction of abutments, wing walls or return walls of culvert/bridge structures, the Contractor shall, at points to be determined by the Engineer suspend work on embankment forming approaches to such structures, until such time as the construction of the latter is sufficiently advanced to permit die completion of approaches without the risk of damage to the structure. Unless directed otherwise, the filling around culverts, bridges and other structures upto a distance twice the height of the road/embankment from the back of die abutment shall be carried out independent of the work on the main embankment. The fill material shall not be placed against any abutment or wing wall, unless permission has been given by the Engineer but in any case not until the concrete or masonry has been in position for 14 days. The embankment and subgrade shall be brought up simultaneously in equal layers on each side of die structure to avoid displacement and unequal pressure. The sequence of work in this regard shall be got approved from the Engineer. The material used for backfill shall not be an organic soil or highly plastic clay having plasticity index and liquid limit more than
20 and 40 respectively when tested according to 15:2720 (Part 5). Filling behind abutments and wing, walls for ail structures shall conform to the general guidelines given in Appendix 6 of IRC:78 (Standard Specifications and Code of Practice Road Bridges-Section VII) in respect of the type of material, the extent of backfill, its laying and Compaction etc. The fill material shall be deposited in horizontal layers in loose thickness and compacted thoroughly to the requirements of Table 300-2. Where the provision of any filter medium is specified behind the abutment, the same shall be laid in layers simultaneously with the laying of fill material. The material used for filter shall conform to the requirements for filter medium spelt out in Clause 2502/309.3.2 (B) unless otherwise specified in the Contract. Where it may be impracticable to use conventional rollers, the compaction shall be carried out by appropriate mechanical means. such as small vibratory roller, plate compactor or power rammer. Care shall be taken to see that the compaction equipment does not hit or come too close to any structural member so as to cause any damage to them or excessive pressure against the structure.

14.2.7.2 Earthwork for high embankment : In the case of high embankments, the Contractor shall normally use the material from the specified borrow area. In case he desires to use different material for his own convenience, he shall have to carry out necessary soil investigations and redesign the high embankment at his own cost. The Contractor shall then furnish the soil test data and design of high embankment for approval of the Engineer, who reserves the right to accept or reject it. If necessary, stage construction of fills and any controlled rates of filling shall be carried out in accordance with the Contract including installation of instruments and its monitoring. Where required, the Contractor shall surcharge embankments or other areas of fill with approved material for the periods specified in the Contract. If settlement of surcharged fill, results in any surcharging material, which is unacceptable for use in the fill being surcharged, lying below formation level, the Contractor shall remove the unacceptable material and dispose it as per direction of the Engineer. He shall then bring the resultant level up to formation level with acceptable material.

14.2.7.3 Surface Finish and **Quality Control** of **Work:** The surface finish of construction of subgrade shall conform to the requirements of Clause 902. Control on the quality of materials and works shall be exercised in accordance with Clause 903.

14.2.7.4 Measurements for Payment

Earth embankment/subgrade construction shall be measured separately by taking cross sections at ten (10) meter (minimum) intervals in the original position before the work starts and after its completion and computing the volumes of earthwork in cubic metres by the method of average end areas. The measurement of fill material from borrow areas shall be the difference between the net quantities of compacted fill and the net quantities of suitable material brought from roadway and drainage excavation. For this purpose, it shall be assumed that one cu.m. of suitable material brought to site from road and drainage excavation forms one cu.m. of compacted fill and all bulking or shrinkage shall be ignored. Construction of embankment under water shall be measured in cu.m. Construction of high embankment with specified material and in specified manner shall be measured in cu.m. Stripping including storing and reapplication of topsoil shall be measured in cu.m. Work involving loosening and recompacting of ground supporting embankment/subgrade shall be measured in cu. m. Removal of unsuitable material at embankment/subgrade foundation and replacement with suitable material shall be measured in cu.m. Scarifying existing granular/bituminous road surface shall be measured in square metres. Dismantling and removal of existing cement concrete pavement shall be measured vide Clause 202.6. Filter medium and backfill material behind abutments, wing walls and other retaining structures shall be measured as finished work in position in cum.

14.2.7.5 Rates

14.2.7.5.1 The Contract unit rates for the items, of embankment and subgrade construction shall be payment in full for carrying out the required operations including full compensation for :

(i) Cost of arrangement of land as a source of supply of material of required quantity for construction unless provided otherwise in the Contract;
(ii) Setting out;
(iii) Compacting ground supporting embankment/subgrade except where removal and replacement of unsuitable material or loosening and recompacting is involved;
(iv) Scarifying or cutting continuous horizontal benches 300 mm wide on side slopes of existing embankment and subgrade as applicable;
(v) Coil of watering or drying of material in borrow areas and/or embankment and subgrade during construction as - required;
(vi) Spreading in layers, bringing to appropriate moisture content and compacting to Specification requirements;
(vii) Shaping and dressing top and slopes of the embankment and subgrade including rounding of comers;
(viii) Restricted working at sites of structures;
(ix) Working on narrow width of embankment and subgrade;
(x) Excavation in all soils from borrow pits/designated borrow areas including clearing and grubbing and transporting the material to embankment and subgrade site with all lifts and leads unless otherwise provided for in the Contract;

(xi) All labour, materials, tools, equipment and incidentals necessary to complete the work to the Specifications;
(xii) Dewatering; and
(xiii) Keeping the embankment/completed formation free of water as per Clause 311.

14.2.7.5.2 In case the Contract unit rate specified is not inclusive of all leads, the unit rate for transporting material beyond the initial lead, as specified in the Contract for construction of embankment and subgrade shall be inclusive of full compensation for all labour, equipment, tools and incidentals necessary on account of the additional haul or transportation involved beyond the specified initial lead.

14.2.7.5.3 Clause 301.9.5 shall apply as regards Contract unit rates for items of stripping and storing top soil and of reapplication of topsoil.

14.2.7.5.4 Clause 301.9.2 shall apply as regards Contract unit rate for the item of loosening and recompacting the embankment/subgrade foundation.

14.2.7.5.5 Clauses 301.9.1 and 305.8 shall apply as regards Contract rates for items of removal of unsuitable material and replacement with suitable material respectively.

14.2.7.5.6 The Contract unit rate for scarifying existing granular/bituminous road surface shall be payment in full for carrying out the required operations including full compensation for all labour, materials, tools, equipment and incidentals necessary to complete the work. This will also comprise of handling, salvaging, stacking and disposing of the dismantled materials within all lifts and upto a lead of 1000 m or as otherwise specified.

14.2.7.5.7 Clause 202.7 shall apply as regards Contract unit rate for dismantling and removal of existing cement concrete pavement,

14.2.7.5.8 The Contract unit rate for providing and laying .filter material behind abutments shall be payment in full for carrying out the required operations including all materials, labour, tools, equipment and incidentals to complete the work to Specifications.

14.2.7.5.9 Clause 305.4.6 shall apply as regards Contract unit rate for construction of embankment under water.

14.2.7.5.10 Clause 305.4.7 shall apply as regards Contract unit rate for construction of high embankment. It shall include cost of instrumentation, its monitoring and settlement period, where specified in the Contract or directed by the Engineer.

14.2.8 SPECIFICATION OF GRANULAR SUB-BASE

14.2.8.1 Physical requirements: The material shall have a 10 per cent fines value of 50 kN or more (for sample in soaked condition) when tested in compliance with BS:812 (Part 111). The water absorption value of the coarse aggregate shall be determined as per IS : 2386 (Pan 3); if this value is greater than 2 per cent, the soundness test shall be carried out on the material delivered to site as per IS : 383. For Grading II and III materials, the CBR shall be

determined at the density and moisture content likely to be developed in equilibrium conditions which shall be taken as being the density relating to a uniform air voids content of 5 per cent.

TABLE 400-2. GRADING FOR COARSE-GRADED GRANULAR SUB –BASE MATERIALS

IS Sieve Designation	Per cent by weight passing the IS Sieve		
	Grading 1	**Grading II**	**Grading III**
75.0 mm	100	—	—
53.0 mm		100	
26.5 mm	55-75	50-80	100
9.50 mm			
4.75 mm	10-30	15-35	25-45
2.36 mm			
0.425 mm			
0.075 mm	<10	<10	<10
CBR Value (Minimum)	30	25	20

Note : The material passing 425 micron (0.425 mm) sieve for all the three grading when vested according to IS : 2720 (Pan 5) shall have liquid limit and plasticity index not more than 25 and 6 per cent respectively.

14.2.8.2 Strength of sub-base

It shall be ensured prior to actual execution that the material to be used in the sub-base satisfies the requirements of CBR and other physical requirements when compacted and finished. When directed by the Engineer, this shall be verified by performing CBR tests in the laboratory as required on specimens remoulded at field dry density and moisture content and any other tests for the "quality" of materials, as may be necessary.

14.2.8.3 Construction Operations

Preparation of subgrade : Immediately prior to the laying of sub-base, the subgrade already finished to Clause 301 or 305 as applicable shall be prepared by removing all vegetation and other extraneous matter, lightly sprinkled with water if necessary and rolled with two passes of 80 -100 kN smooth wheeled roller.

14.2.8.4 Spreading and compacting : The sub-base material of grading specified in the Contract shall be spread on the prepared subgrade with the help of a motor grader of adequate capacity, its blade having hydraulic controls suitable for initial adjustment and for maintaining the required slope and grade during the operation or other means as approved by the Engineer. When the sub-base material consists of combination of materials mentioned in Clause 401.2.1, mixing shall be done mechanically by the mix in place method. Manual mixing shall be permitted only where the width of laying is not adequate for mechanical operations, as in small-sized jobs. The equipment used for mix-in -place construction shall be a rotavator or similar approved equipment

capable of mixing the material to the desired degree. If so desired by the Engineer, trial runs with the equipment shall be carried out to establish its suitability for the work. Moisture content of the loose material shall be checked in accordance with 15:2720 (Part 2) and suitably adjusted by sprinkling additional water from a truck mounted or trailer mounted water tank and suitable for applying water uniformly and at controlled quantities to variable widths of surface or other means approved by the Engineer so that, at the time of compaction, it is from 1 per cent above to 2 per cent below the optimum moisture content corresponding to IS:2720 (Part 8). While adding water, due allowance shall be made for evaporation losses. After water has been added, the material shall be processed by mechanical or other approved means like disc harrows, rotavators until the layer is uniformly wet. Immediately thereafter, rolling shall start. If the thickness of the compacted layer does not exceed 100 mm, a smooth wheeled roller of 80 to 100 kN weight may be used. For a compacted single layer upto 225 mm the compaction shall be done with the help of a vibratory roller of minimum 80 to 100 kN static weight with plain drum or pad foot drum or heavy pneumatic tyred roller of minimum 200 to 300 kN weight having a minimum tyre pressure of 0,7 MN/m2 or equivalent capacity roller capable of achieving the required compaction. Rolling shall commence at the lower edge and proceed towards the upper edge longitudinally for portions having unidirectional crossfall and super elevation and shall commence at the edges and progress towards the centre for portions having cross fall on both sides. Each pass of the roller shall uniformly overlap not less than one third of the track made in the preceding pass. During rolling, the grade and cross fall (camber) shall be checked and any high spots or depressions, which become apparent, corrected by removing or adding fresh material. The speed of the roller shall not exceed 5 km per hour. Rolling shall be continued all the density achieved is at least 98 per cent of the maximum dry density for the material determined as per IS:2720 (Part 8). The surface of any layer of material on completion of compaction shall be well closed, free from movement under compaction equipment and from compaction planes, ridges, cracks or loose material. All loose, segregated or otherwise defective areas shall be made good to the full thickness of layer and re -compacted.

14.2.8.5 Surface Finish and Quality Control of Work

The surface finish of construction shall conform to the requirements of Clause 902. Control on the quality of materials and works shall be exercised by the Engineer in accordance with Section 900.

14.2.8.6 Measurements for Payment

Granular sub -base shall be measured as finished work in position in cubic metres. The protection of edges of granular sub-base extended over the full formation as shown in the drawing shall be considered incidental to the work of providing granular sub-base and as such no extra payment shall be made for the same.

14.2.9 TURFING WITH SODS

14.2.9.1 Scope

This work shall consist of furnishing and laying of the live sod of perennial turf forming grass on embankment slopes, verges (earthen shoulders) or other locations shown on the drawings or as directed by the Engineer. Unless otherwise specified, the work shall be taken up as soon as

possible following construction of the embankment, provided the season is favourable for establishment of the sod.

14.2.9.2 Materials

The sod shall consist of dense, well-rooted growth of permanent and desirable grasses, indigenous to die locality where it is to be used, and shall be practically free from weeds or other undesirable mailer. At the time the sod is cut, the grass on the sod shall have a length of approximately 50 mm and the sod shall have been freed of debris. Thickness of the sod shall be as uniform as possible, with some 50 -80 mm or so of soil covering the grass roots depending on the nature of the sod, so that practically all the dense root system of the grasses is retained in the sod strip. The sods shall be cut in rectangular strips of uniform width, not less than about 250 mm x 300 mm i n size but not so large that it is inconvenient to handle and transport these without damage. During wet weather, the sod shall be allowed to dry sufficiently to prevent rearing durin g handling and during dry weather shall be watered before lifting to ensure its vitality and prevent the dropping of the soil in handling.

14.2.9.3 Construction Operations

14.2.9.3.1 Preparation of the earth bed : The area to be sodded shall have been previously constructed to the required slope and cross section. Soil on the area shall be loosened, freed of all stones larger than 50 mm size, sticks, stump s and any undesirable foreign matter, and brought to a reasonably fine granular texture to a depth of not less than 25 mm for receiving the sod. Where required, topsoil shall be spread over the slopes. Prior to placing the topsoil, the slopes shall be scarified to a depth which, after settlement, will provide the required nominal depth shown on the plans. Spreading shall not be done when the ground is excessively wet. Following soil preparation and top soiling, where required, fertilizer and ground limestone when specified shall be spread uniformly at the rate indicated on the plans. After spreading, the materials arc incorporated in the soil by discing or other means to the depths shown on the pians.

14.2.9.3.2 **Placing the sods :** The prepared sod bed shall be moistened to the loosened depth, if not already sufficiently moist, and the sod shall be placed thereon within approximately 24 hours after the same had been cut. Each sod strip shall be laid edge to edge and such that the joints caused by abutting ends are staggered. Every strip, after it is snugly placed against the strips already in position, shall be lightly lamped with suitable wooden or metal tampers so as to eliminate air pockets and to press it into the underlying soil. On side slopes steeper than 2 (horizontal) to 1 (vertical), the laying of sods shall be started from bottom upwards. At points where water may flow over a sodded area, the upper edges of the sod strips shall be turned into the soil below the adjacent area and a layer of earth placed over tin's followed by its thorough compaction.

14.2.9.3.3 **Staking the sods :** Where the side slope is 2 (horizontal) to 1 (vertical) or steeper and the distance along the slope is more than 2 m, the sods shall be staked with pegs or nails spaced approximately 500 to
1000 mm along the longitudinal axis of the sod strips. Stake shall be driven approximately plumb through the
sods to be almost flush with
them.

14.2.9.3.4 **Top dressing :** After the sods have been laid in position, the surface shall be cleaned of loose sod, excess soil and other foreign material. Thereafter, a thin layer of topsoil shall be scattered over the surface of top dressing and the area thoroughly moistened by prinkling with water:

14.2.9.3.5 **Watering and maintenance :** The sods shall be watered by the Contractor for a period of at least four weeks after laying. Watering shall be so done as to avoid erosion and prevent damage to sodded areas by wheels of water tanks. The Contractor shall erect ecessary warning signs and barriers, repair or replace sodded areas failing to show uniform growth of grass or damaged by his operations and shall otherwise maintain the sod at his cost until final acceptance,

14.2.9.4 Measurements for Payment

Turfing with sods shall be measured as finished work in square metres.

14.2.9.5 Rate

The Contract unit rate for turfing with sods shall mean payment in full for carrying out all the required operations explained above including compensation for

(i) furnishing all the materials to be incorporated in the Works with all leads and lifts; and
(ii) all labours, tools, equipments and incidental to complete the work in accordance with these Specifications.

The Contract unit rate for application of topsoil shall be as per Clause 301.9.5

15. Construction And Supply of Pre-Stretched Concrete(PSC) Porcupine Members:

15.1 General

15.1.1 This specification shall apply to the construction of PSC porcupine members. 15.1.2 Materials and General requirements:

15.1.2.1 High Tensile Steel

Tensile Steel for reinforcement in the form of High steel deformed bars shall conform to IS: 456:2000 Part-I and IS: 1786-2008 respectively. It shall be procured only from BIS approved manufacturers who shall furnish the proof of approval by BIS with the first consignment during the approval and for each fresh approval, each consignment of tensile steel must be accompanied by a test certificate showing the serial no. of bundle and brand tags. Each lots shall carry a tag in accordance with the IS specifications mentioned above. In addition to the normal tests stipulated in the IS specifications for every consignment results of "relaxation test" shall also be furnished once in six months. In case of change of source the first test certificate shall include "relaxation test" results also. The steel shall be used for production only ascertaining that it meets the previous of relevant specifications. The tensile strength of the steel shall as per specification of the porcupine member given in the BoQ.

15.1.2.2 Cement

15.1.2.2.1 Cement shall conform PPC as per IS Code 1489 (Part-1) or OPC 53 grade as per IS Code 12269.

15.1.2.2.2 Each consignment of cement shall be covered by a test certificate. Each consignment shall be stocked separately, tested in the laboratory of the plant immediately for all relevant properties and shall be clearly identified. Cement more than 3 months old, if free form lumps, shall be tested for physical properties by an independent government approved laboratory or as directed by the Inspecting Officer and may be used after his approval.

15.1.2.2.3 The Inspecting Officer has the right to have the cement in stock tested at any time at the cost of manufacture.

15.1.2.2.4 In case the source of supply of cement is changed, the mix design shall be reviewed and modified, if necessary.

15.1.2.2.5 The cement content of the mix shall not be less than 360 kg/cum for M40 concrete.

15.1.2.2.6 Use of any admixture containing chloride in any form is prohibited.

15.1.2.3 Aggregates

15.1.2.3.1 The aggregates shall conform to IS: 383 and shall, before use, be got tested through an approved testing institute and results submitted in accordance with Appendix 'A' of IS: 383 to the Inspecting Officer for approval. These tests shall be got done at the manufacture's cost once in a year or at the time of approval/review of mix design or as desired by inspecting official. The aggregates shall have 30% abrasion and 30% impact value suitable for wearing surfaces when tested in accordance with IS:2386 (Part-IV). The flakiness index and elongation index shall not exceed 30% when tested in accordance with IS:2386 (Part-I).

15.1.2.3.2 Coarse and fine aggregates shall pass sodium or magnesium sulphate accelerated soundness test specified in IS:2386 (Part V) – 1963

15.1.2.3.3 Aggregates shall not contain any harmful material such as pyrites, coal, ignite, mica shale or similar laminated material clay, alkali soft fragments sea shells and organic impurities in such quality as to affect the strength for reinforced concrete shall not contain any material liable to attack steel reinforcement. Maximum limit of deleterious material in aggregates should conform IS: 383 when tested in accordance with IS: 2386-1963.

15.1.2.3.4 Aggregates which are reactive with alkalies of cement are harmful as cracking of concrete may take place. Potential reactiveness of aggregates shall be tested as per IS:2386 (part VII)-1963.

15.1.2.3.5 Coarse aggregates shall be crushed stone, angular in shape and gravel shall not be used.

15.1.2.3.6 Different sized of aggregates shall be stacked in different storage bins or stock piles on the proper hard floor surface. The bins near batching plant must be located under a covered shed to avoid any chance of raw material getting wet due to rains.

15.1.2.4 Water

15.1.2.4.1 Water to be used in making and for curing of concrete shall conform to IS: 456. However use of saline water is prohibited.

15.1.2.4.1 If water needs any treatment before use, adequate storage of treated water for daily requirement shall be made. Facilities for testing treated water shall be provided in the paint.

15.1.2.4.1 The total water content per batch shall be regulated with conform with the ration by weight of free water to cement required for the particular design mix as established by preliminary tests. The total water content of a batch includes:

a) Absorbed water in the aggregates.
b) Free water in the aggregates and
c) Free water added to the mix.

15.1.2.4.1 The water to be mixed at the mixer shall be free water content required per batch less the amount of free water in the aggregates. If wet, or plus the amount of water the aggregates will absorb, if dry. Free moisture content shall be determined at least once a day.

15.1.2.5 Concrete

15.1.2.5.1 The concrete shall be of controlled quality with the nominal maximum size of aggregates limited to 20mm. Where wire spacing permits, aggregates upto 25mm may be used. The manufacturer shall get the concrete mix design along with the upper and lower limits of granulometric curves approved by the Inspecting Officer.

15.1.2.5.2 The granulometric curves shall be plotted on semilog graph once in a week and shall be between the approved limits. Coarse and fine aggregates shall be batched separately.

15.1.2.5.3 The concrete shall satisfy the following design parameters:

i) Minimum release strength after most curing (15cm cube after 7 days): 27 N/Sq. mm (For M-30)
ii) 28 days characteristic compressive After moist curing (15cm cube) : 30 N/sq. mm (For Mix M-30)
iii) Percentage of cubes with strength less than the characteristic strength: Not more than 5 %
iv) Co-efficient of variation (Standard Deviation) : Less than 5

15.1.2.5.4 At the time of approval/review of mix design, 40 cubes shall be cast, using materials proposed for regular manufacture, in 10 batches of 4 cubes each for water curing.

15.1.2.5.5 All the 40 cubes cured according to the proposed moist curing shall attain the specified minimum release strength.

15.2 Manufacture

15.2.1 Moulds

15.2.1.1 Moulds shall be of steel with minimum plate thickness of 6 to 8 mm including end plates. Moulds shall be of rigid construction so as to prevent any in-service distortions. Moulds shall not allow any appreciable leakage of cement mortar in casting. The holes in the end plates shall be accurately drilled for correct placement of prestressing wires.

15.2.2 Stretching of wires

15.2.2.1 The prestressing wire shall be stretched either individually or collectively by an approved method. The tensioning force shall be as shown on the porcupine drawing prepared by the contractor. The final force to be adopted, duly considering the losses while stretching shall be approved by WRD Officer. However, the stretching force shall in no case exceed 75% of the minimum specified UTS of the wire. The pre-tensioning force in the wire shall be applied by a tensioning device equipped with automatic load cut off unit along with measuring gauge. The final force shall also be verified by measuring the extension of the wire.

15.2.3 Mixing and consolidation of concrete

15.2.3.1 Manufacture of PSC porcupines shall be done under a shed.

15.2.3.2 Batching of different ingredients shall be done by weight only. A modern, mechanized, or automatic weight batcher shall be used for weighing aggregates and cement. The weigh batcher shall have an accuracy of +/- 3% to maintain consistency.

15.2.3.3 Modern high-speed mixer, pan, turbine or any other suitable type, approved by the WRD Officer shall be used for mixing concrete. Concreting shall commence within 2 hours of stressing of wires, failing which the HTS wires shall be cheeked and re-tensioned, if necessary.

15.2.3.4 Concrete shall be thoroughly mixed and consolidated by means of vibrators or at least 9000 revolutions/minute. The vibrator should normally be fixed at the bottom of the mould, at least at two different locations for a PSC Porcupine Member. Any other vibration system should have prior approval of WRD.

15.2.3.5 Freshly cast PSC Porcupines shall be protected during the first stage of hardening from adverse weather conditions.

15.2.4 De-tensioning of wires

15.2.4.1 Anchoring system shall provide a device for gradual de-tensioning of the wires. Back pulling of wires for releasing any wedge shall be strictly prohibited. De-tensioning of wires shall be undertaken only after the concrete has attained a compressive strength of 40 N/sq.mm.

15.2.5 Curing

15.2.5.1 Initial curing of concrete PSC Porcupine members shall be done by moist curing at atmospheric pressure till the concrete attains a compressive strength of 27 N/sq. mm for seven day. The period of curing expose to dry and hot weather condition shall not be less than 10 days.

After de-tensioning, the PSC Porcupine Members shall be cured for a further period of not less than 21 days (as per mix design) by submerging in water.

15.2.6 Supervision

15.2.6.1 Suitably qualified person shall be engaged by the manufacturer for supervising the f following items at the works:

i) Placing and stressing of prestressing wire.
ii) Batching, mixing, placement and compaction of concrete. Checking of the moist curing arrangement for its adequacy.
iii) De-moulding of PSC Porcupine Members, water curing, stacking/loading etc.
iv) Inserts shall be checked by suitable jigs before use by the manufacturer.
v) Testing of cement, cement mortar cubes, concrete cubes, concrete beams.
vi) Calibration of testing and measuring equipment and different gauges.

15.2.6.2 Supervisor so engaged shall maintain records as directed by the officers and shall present them for scrutiny when demanded.

i) A site register shall be maintained in which officer record observations against which compliance will be recorded by the supervisor.

ii) Suitable records as per the technical requirements shall be maintained in such a manner that it can be correlated at a later date to the PSC Porcupine before being launched in the river.

15.2.7 Finish

15.2.7.1 All PSC Porcupine Members shall be free from surface defects such as water retaining pockets, air holes or honey combed formations. The ends of the prestressing wires shall be cut close to the surface of the PSC Porcupine Member in such a way that there is minimum damage to end plate and the wire in no case shall project more than 3 mm from the concrete surface. Two coats of suitable ISI marks anti corrosive paint, approved by WRD officer, shall be applied at the ends of the PSC Porcupine member in the following manner:

i) First coat of paint, sufficient thick to form impervious film of paint covering full surface of either ends of a PSC Porcupine Member shall be applied just after de-moulding from its original mould and,

ii. Second coat after taking out the PSC Porcupine Member from submerged water curing tank in the above manner, ensuring that surface to be painted is completely dry and clean of dirt etc.

15.2.7.2 No touching up or finishing by cement mortar etc. shall be permitted on concrete PSC Porcupine, after it is de-moulded.

15.2.8 Stacking

15.2.8.1 After the Porcupine Members have been cured in accordance to clause 3.5.2 and checked both dimensionally and visually, they shall be stacked at convenient place in lots. The stacking of PSC Porcupine Meembers shall be done on leveled and consolidated ground, one over another up to 25 layers. Each layer shall be separated by wooden/concrete battens of 50mm x 50mm of size of suitable lengths to avoid any damage.

15.2.9 Production Lots

15.2.9.1 All PSC Porcupines cast in one shift shall form one lot having markings of date and serial no. painted.

15.3. Inspection and Testing

15.3.1 The manufacturer shall supply at his expense, all the PSC Porcupines required for tests and retests, samples of materials, labour, machine, tools, gauges, apparatus, forms of test reports etc. and any other item which may be necessary or required by the WRD Officer for carrying out any of all of the checks and tests mentioned in these specifications and shall render all reasonable assistance in conduction such checks and tests. All measuring and testing appliance shall be checked and calibrated through government approved agency or as directed by the WRD Officer. The calibration certificate shall be furnished to the WRD Officer. The cost of all such checks and calibrations shall be borne by the manufacturer.

15.3.2 WRD Officer, shall have free access at all reasonable times to the works in which the PSC Porcupines are manufactured. They shall be at liberty to inspect the manufacture of PSC Porcupines at any stage and to reject any material supplies not conforming to the terms of the specifications. They shall be proved with necessary assistance for inspection by the manufacturer.

15.3.3 The Employer reserves the right to employ an independent inspection agent to inspect goods prior to shipment from the Suppliers factory. The costs of such inspections will be borne by the Employer.

15.3.4 Any PSC Porcupine Members delivered to the site or intended to be delivered under this contract may be tested at the discretion of the Employer by an independent testing laboratory following the test standards given in these Specifications. In case difference beyond the normal tolerances and fluctuations experienced during the fabrication process are found in the tests, the Supplier will be directed to replace the Porcupine Member adhering to the specification and standards as required by the Employer and also remove the rejected porcupine Members from the site at the suppliers own cost. In the event, the Employer is not convinced the test results of the Employer's lab shall prevail over those of the Supplier.

15.3.5 The mean values of each test shall be within the limits permitted in these specifications. Any test value outside these limits will be considered/evaluated as "disqualified".

15.3.6 The Employer reserves the right to supervise sampling of any PSC Porcupine Member through its own entrusted personnel, laboratory, and consultants of pre-shipment inspectors.

15.4. Checks and tests

In addition to the control checks exercised on the materials and manufacturing process specified above, the concrete and the finished PSC Porcupines shall be subjected to regular checks and tests, after 14 days submerged water curing, as detailed in clause 3.5.1

15.4.1 Visual and Dimensional Check

Every PSC Porcupine shall be visually inspected for surface finish. No PSC Porcupine shall have surface defects. PSC Porcupine dimensions to be checked are listed below.

i) Critical dimensions are top gap, locations of inserts, distance between inserts at rain seat, distance between outer most inserts.

ii) General dimensions between end to end or the PSC Porcupine Member, width of PSC Porcupine Member at the top and bottom; length of PSC Porcupine Member, and position of high tensile steel wires etc.

iii) Scale of Check:

a) Prior to stabilization of production technique: Scale of check per lot for critical dimensions is 100% (hundred percent) and for general dimension 10% (ten percent) of PSC Porcupines produced.

b) After stabilization of production technique: Scale of check per lot for critical dimensions is 10% (Ten per cent) and for general dimension 1 % (one percent), but the dimensions between outer inserts shall be checked 100%.

15.4.2 Casting of cubes

15 cm size cubes shall be cast on a vibrating table conforming to IS: 2514 (1963) from random samples spread over the entire lot, out of concrete unused for casting PSC Porcupine Members for testing prior to transfer of pre-stress and 28 days.

15.4.2.1 Method of testing
The cubes shall be surface dry at the time of teasing. The rate of loading shall be about 400 KN/minute.

15.4.2.1 Compressive strength of concrete at transfer (release) of pre-stress
These cubes shall be moist cured along with PSC Porcupine Member in the same manner and tested for transfer of pre-stress to concrete.

15.4.2.1 Test for 28 days compressive strength of concrete
These cubes shall be cured for 28 days after de-moulding. Three cubes per lot shall be tested for 28 days compressive strength of concrete. The minimum strength will represent the strength of concrete for that lot. In case strength of concrete is less than 40 N/mm2 for M30 Grade of concrete. The lot shall be rejected and the mix design shall be reviewed.

15.4.2.1 Tests for static bending strength of PSC Porcupine
Method of Testing: The PSC Porcupine Members shall be loaded gradually (20-30 KN/min) upto the specified load, which will be retained at this level of one minute for observing cracks, if any. For the purpose, a crack is defined as one which is barely visible to the naked eye and is at least 15mm long from the tension edge of the PSC Porcupine. However, if crack appears at a load smaller than the aforesaid load, that value shall be recorded.

15.4.3 Acceptance tests

15.4.3.1 Moment of failure (MF) test
Prior to stabilization of production technique, one PSC Porcupine Member for every 250 PSC Porcupines manufactured shall be tested. After the production technique gets stabilized the testing scale shall be reduced to one PSC Porcupine Member for every 750 PSC Porcupine produced.

15.4.3.1 Moment of resistance (MR) test
Depending on 28 days cube strength of the lot as mentioned in para 5.3 and 5.5, the scale of testing for the lot shall be as follows:

i) 30 N/sq.mm and above for M30 – one PSC Porcupine per lot.
ii) In case, 28 days cube strength of the lot is less than 30N/sqmm for M30 Grade, the lot shall be rejected and no testing for the moment of resistance or moment of failure will be conducted.

15.4.3.1 PSC Porcupine Members not meeting the requirements of these Technical Specifications shall be rejected and not be delivered to the site or upon knowledge of defects, should be removed from the Site by the Supplier at his own costs, within two working days.

15.4.3.1 The Employer will issue Receiving Certificates at the Site after receipt of PSC Porcupine Members, verifying the quantities and compliance with the Technical Specifications. The Receiving Certificate qualifies the Supplier for payment in accordance with the payment schedule.

15.4.3.1 Upon completion of the contract and before final acceptance by the Employer, the Supplier shall deliver complete documentation of all details related to the production such as production date of each Member or batch of Members, results of all lab tests conducted for each batch, all readings from pre-stressing operations for each Member, all documents related to stockpiling of Members, curing, transport to the

site, schedule committed and actual, delivery processes adopted and all test contract negotiation. Upon acceptance of this documentation by the Employer, the Employer will issue the Acceptance Certificate to the Supplier.

15.5 STAMPING AND MARKING

15.5.1 All the PSC Porcupine Members shall have legible permanently inscribed and painted markings giving a numbering/serial no. for identification of Lot wise on the top as given in the contract.

15.5.2 The accepted PSC Porcupine Members shall bear the passing marks of the Inspecting Officer in indelible paints. Members which have been subjected to static bending strength test up to cracking and accepted shall in addition be marked b=on the top in indelible paint with the later 'T' MF tested and accepted members shall bear the marking 'MF' in paint with yellow bands at ends.

15.5.3 All PSC porcupine members fit for use shall bear the mark 'FTL' (Fit to Launch) at the center of the Porcupine Member.

15.5.4 Rejected PSC porcupine members shall be stacked separately by the manufacturer so as to avoid their mixing with the accepted PSC Porcupines Members. Such rejected Members shall be marked as …. "RJ" on at least three faces.

15.5.5 All markings mentioned in para 6.1 to 6.2 shall be done with enamel paint of ISI mark. Color and quality of the pain used shall be got approved by the Inspecting Officer. All such markings shall be done by the manufacturer at his cost.

15.6. LOADING AND DESPATCH

15.6.1 Only those PSC Porcupine Members which have been passed, properly marked and accepted by the Inspecting officer shall be loaded for dispatch.

15.6.2 The loading of the passed PSC Porcupine Members in trucks shall be done by the manufacturer as per the loading arrangement approved the Employer. The PSC Porcupine Member shall be properly secured to avoid movement and displacement during transit. The manufacture shall be responsible to replace, free of cost, all the sleepers which are found damaged in transit on account of defective loading

Supplementary Information

Completion of Delivery applicable to both items:

a). The Prestressed Cement Concrete (PCC) Porcupine members should be fabricated and supplied within the borders of India:

i). Manufacture of PCC porcupine members should commence within 2 weeks from the date of receipt of signed contract/agreement from the Purchaser.

ii). Delivery of 20% of finished goods to the designated site should commence within 40 days from the date of receipt of signed contract and the entire supply must be completed within 120 days from the date of issue of signed contract by the purchaser.

Calculation of Delivery Period:

Notwithstanding any other relevant provision(s) in this respect, except for Clause of **Force Majeure**, of the General Conditions of Contract, the Delivery period for the supply of finished Goods under this Contract shall be calculated from the date of issue of signed contract. In all cases the delivery period shall be counted in calendar days, irrespective of weekends or public holidays for festival, etc. excepting for delays beyond the control of the bidder such as natural calamities, bandhs, etc.

Note - 1

For the purposes of this Contract, any percentage of goods shall mean and indicate corresponding percentage of RCC Porcupine Members included in the particular Contract. Evaluation and comparison will be done in accordance with the evaluation criteria as provided in Section III - Evaluation and Qualification Criteria of the Bidding Documents.

Note- 2:

Bids offering delivery schedules beyond 21 days of deviation will be evaluated as "disqualified" and shall be rejected.

Note -3:

The Supplier [the successful Bidder who will be issued with the Notification of Award] shall be required to submit to the Purchaser its manufacturing/fabrication and delivery schedule within two weeks from the date of receipt of issue of signed contract, fully complying with the delivery and completion schedule as given in (a) (ii) above.

Installation:

Installation of the porcupines in the demarcated reaches should be completed within 30 days in correlation to the delivery of porcupines at the respective sites.

In any case the overall installation period should not be beyond 150 days from the date of signing the contract.

Bids offering Installation schedules beyond 10 days of deviation will be evaluated as "disqualified" and shall be rejected.

16. Abbreviations:

16.1 The words like Contract, Contractor, Engineer (synonymous with Engineer-in-charge), Drawings, Employer, Government, Works and Work Site used in these Specifications shall be considered to have meaning as understood from the definitions of these terms given in the General Conditions of Contract

16.2 The following abbreviations shall have the meaning as set forth below:

AASHTO :	American Association of State Highway and Transportation Officials
ASTM :	American Society for Testing and Material
STP:	Selected Technical Papers
BS :	British Standard published by the British Standards Institution
CBR :	California Bearing Ratio
IRC :	Indian Roads Congress
IS :	Indian Standard published by the Bureau of Indian Standards
MoST:	Ministry of Surface Transport
MoRT&H:	Ministry of Road Transport and Highways
CPWD:	Central Public Works Department
CWC:	Central Water Commission
WRD:	Water Resources Department
PMU:	Project management Unit
AIRBMP:	Assam Interrogated River Basin Management Program
RTK:	Real Time Konometer
GNSS:	Global Navigation Satellite System mm: Millimeter
cm:	centimetre
m:	metre
sqm/ m^2:	square metre
cum/m^3:	cubic metre min: minimum
max:	maximum
UV:	Ultra Violate Ray
N:	Newton
Kn:	Kilo Newton
m/s:	minute/second
MPa:	Mega Pascals
KPa:	Giga Pascals
%:	Percentage

PART 3 – Conditions of Contract and Contract Forms

Section VIII - General Conditions of Contract

General Conditions of Contract

A. General

1. Definitions

1.1 Boldface type is used to identify defined terms.

(a) The **Accepted Contract Amount** means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the remedying of any defects.

(b) The **Activity Schedule** is a schedule of the activities comprising the construction, installation, testing, and commissioning of the Works in a lump-sum contract. It includes a lump-sum price for each activity, which is used for valuations and for assessing the effects of Variations and Compensation Events.

(c) The **Adjudicator** is the person appointed jointly by the Employer and the Contractor to resolve disputes in the first instance, as provided for in GCC 23.

(d) **Bank** means the financing institution **named in the PCC**.

(e) **Bill of Quantities** means the priced and completed Bill of Quantities forming part of the Bid.

(f) **Compensation Events** are those defined in GCC Clause 46 hereunder.

(g) The **Completion Date** is the date of completion of the Works as certified by the Project Manager, in accordance with GCC Sub-Clause 57.1.

(h) The **Contract** is the Contract between the Employer and the Contractor to execute, complete, and maintain the Works. It consists of the documents listed in GCC Sub-Clause 2.3 below.

(i) The **Contractor** is the party whose Bid to carry out the Works has been accepted by the Employer.

(j) The **Contractor's Bid** is the completed bidding document submitted by the Contractor to the Employer.

(k) The **Contract Price** is the Accepted Contract Amount stated in the Letter of Acceptance and thereafter as adjusted in accordance with the Contract.

(l) **Days** are calendar days; months are calendar months.

(m) **Dayworks** are varied work inputs subject to payment on a time basis for the Contractor's employees and Equipment, in addition to payments for associated Materials and Plant.

(n) A **Defect** is any part of the Works not completed in accordance with the Contract.

(o) The **Defects Liability Certificate** is the certificate issued by Project Manager upon correction of defects by the Contractor.

(p) The **Defects Liability Period** is the period **named in the PCC** pursuant to GCC Sub-Clause 38.1 and calculated from the Completion Date.

(q) **Drawings** means the drawings of the Works, as included in the Contract, and any additional and modified drawings issued by (or on behalf of) the Employer in accordance with the Contract, include calculations and other information provided or approved by the Project Manager for the execution of the Contract.

(r) The **Employer** is the party who employs the Contractor to carry out the Works, **as specified in the PCC**.

(s) **Equipment** is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works.

(t) "**In writing"** or "**written"** means hand-written, type-written, printed or electronically made, and resulting in a permanent record;

(u) The **Initial Contract Price** is the Contract Price listed in the Employer's Letter of Acceptance.

(v) The **Intended Completion Date** is the date on which it is intended that the Contractor shall complete the Works. The **Intended Completion Date** is specified in the PCC. The **Intended Completion Date** may be revised only by the Project Manager by issuing an extension of time or an acceleration order.

(w) **Materials** are all supplies, including consumables, used by the Contractor for incorporation in the Works.

(x) **Plant** is any integral part of the Works that shall have a mechanical, electrical, chemical, or biological function.

(y) The **Project Manager** is the person named in the PCC (or any other competent person appointed by the Employer and notified to the Contractor, to act in replacement of the Project Manager) who is responsible for supervising the execution of the Works and administering the Contract.

(z) **PCC** means Particular Conditions of Contract.

(aa) The **Site** is the area defined as such in the PCC.

(bb) **Site Investigation Reports** are those that were included in the bidding document and are factual and interpretative

reports about the surface and subsurface conditions at the Site.

(cc) **Specification** means the Specification of the Works included in the Contract and any modification or addition made or approved by the Project Manager.

(dd) The **Start Date** is **given in the PCC**. It is the latest date when the Contractor shall commence execution of the Works. It does not necessarily coincide with any of the Site Possession Dates.

(ee) A **Subcontractor** is a person or corporate body who has a Contract with the Contractor to carry out a part of the work in the Contract, which includes work on the Site.

(ff) **Temporary Works** are works designed, constructed, installed, and removed by the Contractor that are needed for construction or installation of the Works.

(gg) A **Variation** is an instruction given by the Project Manager which varies the Works.

(hh) The **Works** are what the Contract requires the Contractor to construct, install, and turn over to the Employer, as defined in the PCC.

(ii) "**Contractor's Personnel**" refers to all personnel whom the Contractor utilizes on the Site or other places where the Works are carried out, including the staff, labor and other employees of each Subcontractor.

(jj) **"Key Personnel"** means the positions (if any) of the Contractor's personnel that are stated in the Specification.

(kk) **"ES"** means Environmental and Social (including Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH)).

(ll) **"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.

(mm) **"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; and

(nn) "**Employer's Personnel"** refers to the Project Manager and all other staff, labor and other employees (if any) of the Project Manager and of the Employer engaged in fulfilling the Employer's obligations under the Contract; and any other personnel identified as Employer's Personnel, by a notice from the Employer or the Project Manager to the Contractor.

2. Interpretation

2.1 In interpreting these GCC, words indicating one gender include all genders. Words indicating the singular also include the plural and words indicating the plural also include the singular. Headings have no significance. Words have their normal meaning under the language of the Contract unless specifically defined. The Project Manager shall provide instructions clarifying queries about these GCC.

2.2 If sectional completion is **specified in the PCC**, references in the GCC to the Works, the Completion Date, and the Intended Completion Date apply to any Section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works).

2.3 The documents forming the Contract shall be interpreted in the following order of priority:

(a) Agreement,

(b) Letter of Acceptance,

(c) Contractor's Bid,

(d) Particular Conditions of Contract,

(e) General Conditions of Contract, including Appendices,

(f) Specifications,

(g) Drawings,

(h) Bill of Quantities,[16] and

(i) any other document **listed in the PCC** as forming part of the Contract.

3. Language and Law

3.1 The language of the Contract and the law governing the Contract are **stated in the PCC**.

3.2 Throughout the execution of the Contract, the Contractor shall comply with the import of goods and services prohibitions in the Employer's country when

(a) as a matter of law or official regulations, the Borrower's country prohibits commercial relations with that country; 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

[16] In lump-sum contracts, delete "Bill of Quantities" and replace with "Activity Schedule."

United Nations, the Borrower's Country prohibits any import of goods from that country or any payments to any country, person, or entity in that country.

4. Project Manager's Decisions

4.1 Except where otherwise specifically stated, the Project Manager shall decide contractual matters between the Employer and the Contractor in the role representing the Employer.

5. Delegation

5.1 Unless otherwise **specified in the PCC,** the Project Manager may delegate any of his duties and responsibilities to other people, except to the Adjudicator, after notifying the Contractor, and may revoke any delegation after notifying the Contractor.

6. Communications

6.1 Communications between parties that are referred to in the Conditions shall be effective only when in writing. A notice shall be effective only when it is delivered.

7. Subcontracting

7.1 The Contractor may subcontract with the approval of the Project Manager, but may not assign the Contract without the approval of the Employer in writing. Subcontracting shall not alter the Contractor's obligations. The Contractor shall require that its Subcontractors execute the Works in accordance with the Contract, including complying with the relevant ES requirements and the obligations set out in Sub-Clause 28.1.

8. Other Contractors

8.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities, and the Employer between the dates given in the Schedule of Other Contractors, as **referred to in the PCC.** The Contractor shall also provide facilities and services for them as described in the Schedule. The Employer may modify the Schedule of Other Contractors, and shall notify the Contractor of any such modification.

8.2 The Contractor shall also, as stated in the Specifications or as instructed by the Project Manager, cooperate with and allow appropriate opportunities for the Employer's or any other personnel, notified to the Contractor by the Employer or Project Manager, to conduct any environmental and social assessment.

9. Personnel and Equipment

9.1 The Contractor shall employ the Key Personnel and use the Equipment identified in its Bid, to carry out the Works or other personnel and Equipment approved by the Project Manager. The Project Manager shall approve any proposed replacement of Key Personnel and Equipment only if their relevant qualifications or characteristics are substantially equal to or better than those proposed in the Bid.

9.2 The Project Manager may require the Contractor to remove (or cause to be removed) any person employed on the Site or Works, including the 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;

(g) undertakes behavior which breaches the Code of Conduct 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.

Notwithstanding any requirement from the Project Manager 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."

9.3 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, 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.

9.4 Labor

9.4.1 *Engagement of Staff and Labor*. The Contractor shall provide and employ on the Site for the execution of the Works such skilled, semi-skilled and unskilled labor as is necessary for the proper and timely execution of the Contract. The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labor with appropriate qualifications and experience from sources within the Country.

Unless otherwise provided in the Contract, the Contractor shall be responsible for the recruitment, transportation, accommodation and welfare facilities in accordance with GCC Sub-Clause 9.4.6, of the Contractor's Personnel, and for all payments in connection therewith.

The Contractor shall provide the Contractor's Personnel information and documentation that are clear and understandable regarding their terms and conditions of employment. The information and documentation shall set out

their rights under relevant labor laws applicable to the Contractor's Personnel (which will include any applicable collective agreements), including their rights related to hours of work, wages, overtime, compensation and benefits, as well as those arising from any requirements in the Specifications. The Contractor's Personnel shall be informed when any material changes to their terms or conditions of employment occur.

9.4.2 *Conditions of Labor*. 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 Specifications; 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 Specifications, 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.

9.4.3 The Contractor may bring into the Country any foreign personnel who are necessary for the execution of the Works to the extent allowed by the applicable Laws. The Contractor shall ensure that these personnel are provided with the required residence visas and work permits. The Employer will, if requested by the Contractor, use its best endeavors in a timely and expeditious manner to assist the Contractor in obtaining any local, state, national, or government permission required for bringing in the Contractor's personnel.

9.4.4 The Contractor shall at its own expense provide the means of repatriation to and the Contractor's Personnel employed on the Contract at the Site to their various home countries. It shall also provide suitable temporary maintenance of all such persons from the cessation of their employment on the Contract to the date programmed for their departure. In the event that the Contractor defaults in providing such means of transportation and temporary maintenance, the Employer may provide the same to such personnel and recover the cost of doing so from the Contractor.

9.4.5 *Disorderly conduct.* The Contractor shall at all times during the progress of the Contract use its best endeavors to prevent any unlawful, riotous or disorderly conduct or behavior by or amongst the Contractor's Personnel.

9.4.6 *Facilities for Staff and Labor*. Except as otherwise stated in the Specification, the Contractor shall provide and maintain all necessary accommodation and welfare facilities for the Contractor's Personnel. 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 if stated in the Specifications.

9.4.7 The Contractor shall, in all dealings with the Contractor's Personnel, pay due regard to all recognized festivals, official holidays, religious or other customs and all local laws and regulations pertaining to the employment of labor. 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 Specifications.

9.4.8 *Supply of Foodstuff*s. 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.

9.4.9 *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.

9.4.10 *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.

9.4.11 *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.

9.4.12 *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.

9.4.13 *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.

9.4.14 *Forced Labor*. The Contractor, including its Subcontractors, shall not employ or engage forced labor. Forced labor consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty, and includes any kind of involuntary or compulsory labor, such as indentured labor, bonded labor or similar labor-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, harboring or receipt of persons by means of the threat or use of force or other forms of coercion, abduction, fraud, deception, abuse of power, or of a position of vulnerability, or of the giving or receiving of payments or benefits to achieve the consent of a person having control over another person, for the purposes of exploitation.

9.4.15 *Child Labor*. 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 Project Manager's approval. The Contractor shall be subject to regular monitoring by the Project Manager 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

(d) transport of heavy loads;

(e) in unhealthy environments exposing children to hazardous substances, agents, or processes, or to temperatures, noise or vibration damaging to health; or

(f) under difficult conditions such as work for long hours, during the night or in confinement on the premises of the employer.

9.4.16 *Employment Records of Workers.* The Contractor shall keep complete and accurate records of the employment of labor at the Site. The records shall include the names, ages, genders, hours worked, and wages paid to all workers. These records shall be summarized on a monthly basis and submitted to the project Manager.

9.4.17 *Workers' Organizations*. In countries where the relevant labor laws recognize workers' rights to form and to join workers' organizations of their choosing and to bargain collectively without interference, the Contractor shall comply with such laws. In such circumstances, the role of legally established workers' organizations and legitimate workers' representatives will be respected, and they will be provided with information needed for meaningful negotiation in a timely manner. Where the relevant labor laws substantially restrict workers' organizations, the Contractor shall enable alternative means for the Contractor's Personnel to express their grievances and protect their rights regarding working conditions and terms of employment. The Contractor shall not seek to influence or control these alternative means. The Contractor shall not discriminate or retaliate against the Contractor's Personnel who participate, or seek to participate, in such organizations and collective bargaining or alternative mechanisms. Workers' organizations are expected to fairly represent the workers in the workforce.

9.4.18 *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 GCC Sub-Clause 9.4.15).

9.4.19 *Contractor's Personnel Grievance Mechanism.* The Contractor shall have a grievance mechanism for Contractor's Personnel, and where relevant the workers' organizations stated in GCC Sub-Clause 9.4.17, 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.

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 Contractor's Personnel. Existing grievance mechanisms may be supplemented as needed with Contract-specific arrangements.

9.4.20 *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 GCC Sub-Clause 18.2.

As stated in the Specifications or as instructed by the Project Manager, 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.

10. Employer's and Contractor's Risks

10.1 The Employer carries the risks which this Contract states are Employer's risks, and the Contractor carries the risks which this Contract states are Contractor's risks.

11. Employer's Risks

11.1 From the Start Date until the Defects Liability Certificate has been issued, the following are Employer's risks:

(a) The risk of personal injury, death, or loss of or damage to property (excluding the Works, Plant, Materials, and Equipment), which are due to

(i) use or occupation of the Site by the Works or for the purpose of the Works, which is the unavoidable result of the Works or

(ii) negligence, breach of statutory duty, or interference with any legal right by the Employer or by any person employed by or contracted to him except the Contractor.

(b) The risk of damage to the Works, Plant, Materials, and Equipment to the extent that it is due to a fault of the Employer or in the Employer's design, or due to war or radioactive contamination directly affecting the country where the Works are to be executed.

11.2 From the Completion Date until the Defects Liability Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is an Employer's risk except loss or damage due to

(a) a Defect which existed on the Completion Date,

(b) an event occurring before the Completion Date, which was not itself an Employer's risk, or

(c) the activities of the Contractor on the Site after the Completion Date.

12. Contractor's Risks

12.1 From the Starting Date until the Defects Liability Certificate has been issued, the risks of personal injury, death, and loss of or damage to property (including, without limitation, the Works, Plant, Materials, and Equipment) which are not Employer's risks are Contractor's risks.

13. Insurance

13.1 The Contractor shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts and deductibles **stated in the PCC** for the following events which are due to the Contractor's risks:

(a) loss of or damage to the Works, Plant, and Materials;

(b) loss of or damage to Equipment;

(c) loss of or damage to property (except the Works, Plant, Materials, and Equipment) in connection with the Contract; and

(d) personal injury or death.

13.2 Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for the Project Manager's approval before the Start Date. All such insurance shall provide

for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.

13.3 If the Contractor does not provide any of the policies and certificates required, the Employer may effect the insurance which the Contractor should have provided and recover the premiums the Employer has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.

13.4 Alterations to the terms of an insurance shall not be made without the approval of the Project Manager.

13.5 Both parties shall comply with any conditions of the insurance policies.

14. Site Data

14.1 The Contractor shall be deemed to have examined any Site Data **referred to in the PCC**, supplemented by any information available to the Contractor.

15. Contractor to Construct the Works

15.1 The Contractor shall construct and install the Works in accordance with the Specifications and Drawings.

15.2 If the Contract specifies that the Contractor shall design any part of the permanent Works, the Contractor shall take into account the Employer's requirements which may include, if stated in the Specifications:

(a) designing structural elements of the Works taking into account climate change considerations;

(b) applying 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; and

(c) considering the incremental risks of the public's potential exposure to operational accidents or natural hazards, including extreme weather events.

16. The Works to Be Completed by the Intended Completion Date

16.1 The Contractor may commence execution of the Works on the Start Date and shall carry out the Works in accordance with the Program submitted by the Contractor, as updated with the approval of the Project Manager, and complete them by the Intended Completion Date.

16.2 The Contractor shall not carry out mobilization to the Site unless the Project Manager gives approval, an approval that shall not be unreasonably delayed, to the measures the Contractor proposes to address environmental and social risks and impacts, which at a minimum shall include applying the Management Strategies and Implementation Plans (MSIPs) and Code of Conduct for Contractor's Personnel submitted as part of the Bid and agreed as part of the Contract.

The Contractor shall submit, to the Project Manager for its approval any additional MSIPs as are necessary to manage the ES risks and impacts of ongoing Works. 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 Project Manager for its approval.

17. Approval by the Project Manager

17.1 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Project Manager, for his approval.

17.2 The Contractor shall be responsible for design of Temporary Works.

17.3 The Project Manager's approval shall not alter the Contractor's responsibility for design of the Temporary Works.

17.4 The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required.

17.5 All Drawings prepared by the Contractor for the execution of the temporary or permanent Works, are subject to prior approval by the Project Manager before this use.

18. Health, Safety and Protection of the Environment

18.1 The Contractor shall be responsible for the safety of all activities on the Site.

18.2 The Contractor shall:

(a) comply with all applicable health and safety regulations and Laws;

(b) comply with all applicable health and safety obligations specified in the Contract;

(c) take care for the health and safety of all persons entitled to be on the Site and other places, if any, where the Works are being executed;

(d) keep the Site and Works clear of unnecessary obstruction so as to avoid danger to these persons;

(e) provide fencing, lighting, safe access, guarding and watching of the Works until the issue of the Contract Completion Certificate;

(f) provide any Temporary Works (including roadways, footways, guards and fences) which may be necessary, because of the execution of the Works, for the use and protection of the public and of owners and occupiers of adjacent land;

(g) provide health and safety training of Contractor's Personnel as appropriate and maintain training records;

(h) actively engage the Contractor's Personnel in promoting understanding, and methods for, implementation of health and safety requirements, as well as in providing information to Contractor's Personnel, training on occupational safety and health, and provision of personal protective equipment without expense to the Contractor's Personnel;

(i) 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.

(j) 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;

(k) where the Employer's Personnel, any other contractors employed by the Employer, and/or personnel of any legally constituted public authorities and private utility companies are employed in carrying out, on or near the site, of any work not included in the Contract, collaborate in applying the health and safety requirements, without prejudice to the responsibility of the relevant entities for the health and safety of their own personnel; and

(l) establish and implement a system for regular (not less than six-monthly) review of health and safety performance and the working environment.

Subject to GCC Sub-Clause 16.2, the Contractor shall submit to the Project Manager for its approval 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 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) remedies for adverse impacts such as occupational injuries, deaths, disability and disease;

(v) 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,

(vi) the measures to be implemented to avoid or minimize the spread of communicable diseases (including transfer of Sexually Transmitted Diseases or Infections (STDs), such as HIV virus) and non-communicable diseases associated with the execution of the Works, taking into consideration differentiated exposure to and higher sensitivity of vulnerable groups. This includes taking measures to avoid or minimize the transmission of communicable diseases that may be associated with the influx of temporary or permanent Contract-related labor;

(vii) 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 GCC Sub-Clause 9.4.6; and

(b) any other requirements stated in the Specification

18.3 Protection of the environment

The Contractor shall take all necessary measures to:

18.3.1 protect the environment (both on and off the Site); and

18.3.2 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 Specifications, 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 Project Manager 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 Project Manager.

19. Archaeological and Geological Findings

19.1 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 Specifications and relevant laws.

The Contractor shall, as soon as practicable after discovery of any such finding, notify the Project Manager of such discoveries and carry out the Project Manager's instructions for dealing with them.

20. Possession of the Site

20.1 The Employer shall give possession of all parts of the Site to the Contractor. If possession of a part is not given by the date **stated in the PCC,** the Employer shall be deemed to have delayed the start of the relevant activities, and this shall be a Compensation Event.

21. Access to the Site

21.1 The Contractor shall allow the Project Manager and any person authorized by the Project Manager (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), including to carry out environmental and social audit, as appropriate,access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.

22. Instructions, Inspections and Audits

22.1 The Contractor shall carry out all instructions of the Project Manager which comply with the applicable laws where the Site is located.

22.2 The Contractor shall keep, and shall make all reasonable efforts to cause its Subcontractors and subconsultants to keep, accurate and systematic accounts and records in respect of the Works in such form and details as will clearly identify relevant time changes and costs.

22.3 Inspections &Audit by the Bank

Pursuant to paragraph 2.2 e. of Appendix A to the GCC- 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 GCC Sub-Clause 25.1 (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).

23. Appointment of the Adjudicator

23.1 The Adjudicator shall be appointed jointly by the Employer and the Contractor, at the time of the Employer's issuance of the Letter of Acceptance. If, in the Letter of Acceptance, the Employer does not agree on the appointment of the Adjudicator, the Employer will request the Appointing Authority **designated in the PCC**, to appoint the Adjudicator within 14 days of receipt of such request.

23.2 Should the Adjudicator resign or die, or should the Employer and the Contractor agree that the Adjudicator is not functioning in accordance with the provisions of the Contract, a new Adjudicator shall be jointly appointed by the Employer and the Contractor. In case of disagreement between the Employer and the Contractor, within 30 days, the Adjudicator shall be designated by the Appointing Authority **designated in the PCC** at the request of either party, within 14 days of receipt of such request.

24. Procedure for Disputes

24.1 If the Contractor believes that a decision taken by the Project Manager was either outside the authority given to the Project Manager by the Contract or that the decision was wrongly taken, the decision shall be referred to the Adjudicator within 14 days of the notification of the Project Manager's decision.

24.2 The Adjudicator shall give a decision in writing within 28 days of receipt of a notification of a dispute.

24.3 The Adjudicator shall be paid by the hour at the **rate specified in thePCC,** together with reimbursable expenses of the types **specified in the PCC**, and the cost shall be divided equally between the Employer and the Contractor, whatever decision is reached by the Adjudicator. Either party may refer a decision of the Adjudicator to an Arbitrator within 28 days of the Adjudicator's written decision. If neither party refers the dispute to arbitration within the above 28 days, the Adjudicator's decision shall be final and binding.

24.4 The arbitration shall be conducted in accordance with the arbitration procedures published by the institution named and in the place **specifiedin the PCC.**

25. Fraud and Corruption

25.1 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 Appendix A to the GCC.

25.2 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.

26. Stakeholder Engagement

26.1 The Contractor shall provide relevant contract- related information, as the Employer and/or Project Manager 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 may also directly participate in Stakeholder engagements, as the Employer and/or Project Manager may reasonably request

27. Suppliers (other than Subcontractors)

27.1 Forced Labor: The Contractor shall take measures to require its suppliers (other than Subcontractors) not to employ or engage forced labor including trafficked persons as described in GCC Sub-Clause 9.4.14. If forced labor/trafficking cases are identified, the Contractor shall take measures to require the suppliers to take appropriate steps to remedy them. Where the supplier does not remedy the situation, the Contractor shall within a reasonable period substitute the supplier with a supplier that is able to manage such risks.

27.2 *Child Labor:* The Contractor shall take measures to require its suppliers (other than Subcontractors) not to employ or engage child labor as described in GCC Sub-Clause 9.4.15. If child labor cases are identified, the Contractor shall take measures to

require the suppliers to take appropriate steps to remedy them. Where the supplier does not remedy the situation, the Contractor shall within a reasonable period substitute the supplier with a supplier that is able to manage such risks.

27.3 *Serious Safety Issues:* The Contractor, including its Subcontractors, shall comply with all applicable safety obligations, including as stated in GCC Sub-Clause 18.2. 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.

27.4 *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.

28. Code of Conduct

28.1 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 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.

The Contractor's Management Strategy and Implementation Plans shall include appropriate processes for the Contractor to verify compliance with these obligations.

29. Security of the Site

29.1 The Contractor shall be responsible for the security of the Site, and:

(a) for keeping unauthorized persons off the Site;

(b) authorized persons shall be limited to the Contractor's Personnel, the Employer's Personnel, and to any other personnel identified as authorized personnel (including the Employer's other contractors on the Site), by a notice from the Employer or the Project Manager to the Contractor.

Subject to GCC Sub-Clause 16.2, the Contractor shall submit for the Project Manager'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 Specifications.

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."

B. Time Control

30. Program and Progress Reports

30.1 Within the time **stated in the PCC**, after the date of the Letter of Acceptance, the Contractor shall submit to the Project Manager for approval a Program showing the general methods, arrangements, order, and timing for all the activities in the Works. In the case of a lump-sum contract, the activities in the Program shall be consistent with those in the Activity Schedule. The Project Manager's approval of the Program shall not alter the Contractor's obligations. The Contractor may revise the Program and submit it to the Project Manager again at any time.

A revised Program shall show the effect of Variations and Compensation Events.

30.2 An update of the Program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequence of the activities.

30.3 The Contractor shall monitor progress of the Works and submit to the Project manager progress report and any updated Program showing the actual progress achieved and the effect of the progress achieved on the timing of the remaining Works, including any changes to the sequence of the activities, at intervals no longer than the period **stated in the PCC.** If the Contractor does not submit an updated Program within this period, the Project Manager may withhold the amount **stated in the PCC** from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program has been submitted. In the case of lump-sum Contract, the Contractor shall provide an updated Activity Schedule within 14 days of being instructed to by the Project Manager.

30.4 Unless otherwise stated in the Specifications, each progress report shall include the Environmental and Social (ES) metrics set out in Appendix B.

30.5 In addition to the progress reports, the Contractor shall inform the Project Manager immediately of any allegation, incident or accident in the Site, which has or is likely to have a significant adverse effect on the environment, the affected communities, the public, Employer's Personnel, Project Manager'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 Project Manager 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 Project Manager within the timeframe agreed with the Project Manager.

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.

31. Extension of the Intended Completion Date

31.1 The Project Manager shall extend the Intended Completion Date if a Compensation Event occurs or a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining work, which would cause the Contractor to incur additional cost.

31.2 The Project Manager shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Contractor asking the Project Manager for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new Intended Completion Date.

32. Acceleration

32.1 When the Employer wants the Contractor to finish before the Intended Completion Date, the Project Manager shall obtain priced proposals for achieving the necessary acceleration from the Contractor. If the Employer accepts these proposals, the Intended Completion Date shall be adjusted accordingly and confirmed by both the Employer and the Contractor.

32.2 If the Contractor's priced proposals for an acceleration are accepted by the Employer, they are incorporated in the Contract Price and treated as a Variation.

33. Delays Ordered by the Project Manager

33.1 The Project Manager may instruct the Contractor to delay the start or progress of any activity within the Works.

34. Management Meetings

34.1 Either the Project Manager or the Contractor may require the other to attend a management meeting. The business of a management meeting shall be to review the plans for remaining work and to deal with matters raised in accordance with the early warning procedure.

34.2 The Project Manager shall record the business of management meetings and provide copies of the record to those attending the meeting and to the Employer. The responsibility of the parties for actions to be taken shall be decided by the Project Manager either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

35. Early Warning

35.1 The Contractor shall warn the Project Manager at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the work, increase the Contract Price, or delay the execution of the Works. The Project

Manager may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Completion Date. The estimate shall be provided by the Contractor as soon as reasonably possible.

35.2 The Contractor shall cooperate with the Project Manager in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the work and in carrying out any resulting instruction of the Project Manager.

C. Quality Control

36. Identifying Defects

36.1 The Project Manager shall check the Contractor's work and notify the Contractor of any Defects that are found. Such checking shall not affect the Contractor's responsibilities. The Project Manager may instruct the Contractor to search for a Defect and to uncover and test any work that the Project Manager considers may have a Defect.

37. Tests

37.1 If the Project Manager instructs the Contractor to carry out a test not specified in the Specifications to check whether any work has a Defect and the test shows that it does, the Contractor shall pay for the test and any samples. If there is no Defect, the test shall be a Compensation Event.

38. Correction of Defects

38.1 The Project Manager shall give notice to the Contractor of any Defects before the end of the Defects Liability Period, which begins at Completion, and is **defined in the PCC.** The Defects Liability Period shall be extended for as long as Defects remain to be corrected.

38.2 Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Project Manager's notice.

39. Uncorrected Defects

39.1 If the Contractor has not corrected a Defect within the time specified in the Project Manager's notice, the Project Manager shall assess the cost of having the Defect corrected, and the Contractor shall pay this amount.

D. Cost Control

40. Contract Price

40.1 The Bill of Quantities shall contain priced items for the Works to be performed by the Contractor. The Bill of Quantities is used to calculate the Contract Price. The Contractor will be paid for the quantity of the work accomplished at the rate in the Bill of Quantities for each item.

41. Changes in the Contract Price

41.1 If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 25 percent, provided the change exceeds 1 percent of the Initial

Contract Price, the Project Manager shall adjust the rate to allow for the change. The Project Manager shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 15 percent, except with the prior approval of the Employer.

41.2 If requested by the Project Manager, the Contractor shall provide the Project Manager with a detailed cost breakdown of any rate in the Bill of Quantities.

42. Variations

42.1 All Variations shall be included in updated Programs produced by the Contractor.

42.2 The Contractor shall provide the Project Manager with a quotation for carrying out the Variation when requested to do so by the Project Manager. The Contractor shall also provide information of any ES risks and impacts of the Variation. The Project Manager shall assess the quotation, which shall be given within seven (7) days of the request or within any longer period stated by the Project Manager and before the Variation is ordered.

42.3 If the Contractor's quotation is unreasonable, the Project Manager may order the Variation and make a change to the Contract Price, which shall be based on the Project Manager's own forecast of the effects of the Variation on the Contractor's costs.

42.4 If the Project Manager decides that the urgency of varying the work would prevent a quotation being given and considered without delaying the work, no quotation shall be given and the Variation shall be treated as a Compensation Event.

42.5 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning.

42.6 If the work in the Variation corresponds to an item description in the Bill of Quantities and if, in the opinion of the Project Manager, the quantity of work above the limit stated in GCC Sub-Clause 41.1 or the timing of its execution do not cause the cost per unit of quantity to change, the rate in the Bill of Quantities shall be used to calculate the value of the Variation. If the cost per unit of quantity changes, or if the nature or timing of the work in the Variation does not correspond with items in the Bill of Quantities, the quotation by the Contractor shall be in the form of new rates for the relevant items of work.

42.7 Value Engineering: The Contractor may prepare, at its own cost, a value engineering proposal at any time during the performance of the contract. The value engineering proposal shall, at a minimum, include the following;

(a) the proposed change(s), and a description of the difference to the existing contract requirements;

(b) a full cost/benefit analysis of the proposed change(s) including a description and estimate of costs (including life cycle cost) the Employer may incur in implementing the value engineering proposal;

(c) a description of any effect(s) of the change on performance/functionality; and

(d) a description of the proposed work to be performed, a program for its execution and sufficient ES information to enable an evaluation of ES risks and impacts.

The Employer may accept the value engineering proposal if the proposal demonstrates benefits that:

(a) accelerates the contract completion period; or

(b) reduces the Contract Price or the life cycle costs to the Employer; or

(c) improves the quality, efficiency, safety or sustainability of the Facilities; or

(d) yields any other benefits to the Employer,

without compromising the functionality of the Works.

If the value engineering proposal is approved by the Employer and results in:

(a) a reduction of the Contract Price; the amount to be paid to the Contractor shall be the **percentage specified in the PCC** of the reduction in the Contract Price; or

(b) an increase in the Contract Price; but results in a reduction in life cycle costs due to any benefit described in (a) to (d) above, the amount to be paid to the Contractor shall be the full increase in the Contract Price.

43. Cash Flow Forecasts

43.1 When the Program, is updated, the Contractor shall provide the Project Manager with an updated cash flow forecast. The cash flow forecast shall include different currencies, as defined in the Contract, converted as necessary using the Contract exchange rates.

44. Payment Certificates

44.1 The Contractor shall submit to the Project Manager monthly statements of the estimated value of the work executed less the cumulative amount certified previously.

44.2 The Project Manager shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor.

44.3 The value of work executed shall be determined by the Project Manager.

44.4 The value of work executed shall comprise the value of the quantities of work in the Bill of Quantities that have been completed.

44.5 The value of work executed shall include the valuation of Variations and Compensation Events.

44.6 The Project Manager may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.

44.7 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 Project Manager, may be withheld until the work or obligation has been performed, and/or the cost of rectification or replacement, as determined by the Project Manager, may be withheld until rectification or replacement has been completed. Failure to perform includes, but is not limited to the following:

(a) failure to comply with any ES obligations or work described in the Works' Requirements which may include: working outside site boundaries, excessive dust, failure to keep public roads in a safe usable condition, damage to offsite vegetation, pollution of water courses from oils or sedimentation, contamination of land e.g. from oils, human waste, damage to archeology or cultural heritage features, air pollution as a result of unauthorized and/or inefficient combustion;

(b) failure to regularly review C-ESMP and/or update it in a timely manner to address emerging ES issues, or anticipated risks or impacts;

(c) failure to implement the C-ESMP e.g. failure to provide required training or sensitization;

(d) failing to have appropriate consents/permits prior to undertaking Works or related activities;

(e) failure to submit ES report/s (as described in Appendix B), or failure to submit such reports in a timely manner;

(f) failure to implement remediation as instructed by the Project Manager within the specified timeframe (e.g. remediation addressing non-compliance/s).

45. Payments

45.1 Payments shall be adjusted for deductions for advance payments and retention. The Employer shall pay the Contractor the amounts certified by the Project Manager within 28 days of the date of each certificate. If the Employer makes a late payment, the Contractor shall be paid interest on the late payment in the next payment. Interest shall be calculated from the date by which the payment should have been made up to the date when the late payment is made at the prevailing rate of interest for commercial borrowing for each of the currencies in which payments are made.

45.2 If an amount certified is increased in a later certificate or as a result of an award by the Adjudicator or an Arbitrator, the Contractor shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.

45.3 Unless otherwise stated, all payments and deductions shall be paid or charged in the proportions of currencies comprising the Contract Price.

45.4 Items of the Works for which no rate or price has been entered in shall not be paid for by the Employer and shall be deemed covered by other rates and prices in the Contract.

46. Compensation Events

46.1 The following shall be Compensation Events:

(a) The Employer does not give access to a part of the Site by the Site Possession Date pursuant to GCC Sub-Clause 20.1.

(b) The Employer modifies the Schedule of Other Contractors in a way that affects the work of the Contractor under the Contract.

(c) The Project Manager orders a delay or does not issue Drawings, Specifications, or instructions required for execution of the Works on time.

(d) The Project Manager instructs the Contractor to uncover or to carry out additional tests upon work, which is then found to have no Defects.

(e) The Project Manager unreasonably does not approve a subcontract to be let.

(f) Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of the Letter of Acceptance from the information issued to bidders (including the Site Investigation Reports), from information available publicly and from a visual inspection of the Site.

(g) The Project Manager gives an instruction for dealing with an unforeseen condition, caused by the Employer, or additional work required for safety or other reasons.

(h) Other contractors, public authorities, utilities, or the Employer does not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor.

(i) The advance payment is delayed.

(j) The effects on the Contractor of any of the Employer's Risks.

(k) The Project Manager unreasonably delays issuing a Certificate of Completion.

46.2 If a Compensation Event would cause additional cost or would prevent the work being completed before the Intended Completion Date, the Contract Price shall be increased and/or the Intended Completion Date shall be extended. The Project Manager shall decide whether and by how much the Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended.

46.3 As soon as information demonstrating the effect of each Compensation Event upon the Contractor's forecast cost has been provided by the Contractor, it shall be assessed by the Project Manager, and the Contract Price shall be adjusted accordingly. If the Contractor's forecast is deemed unreasonable, the Project Manager shall adjust the Contract Price based on the Project Manager's own forecast. The Project Manager shall assume that the Contractor shall react competently and promptly to the event.

46.4 The Contractor shall not be entitled to compensation to the extent that the Employer's interests are adversely affected by the Contractor's not having given early warning or not having cooperated with the Project Manager.

47. Tax

47.1 The Project Manager shall adjust the Contract Price if taxes, duties, and other levies are changed between the date 28 days before the submission of bids for the Contract and the date of the last Completion certificate. The adjustment shall be the change in the amount of tax payable by the Contractor, provided such changes are not already reflected in the Contract Price or are a result of GCC Clause 49.

48. Currencies

48.1 Where payments are made in currencies other than the currency of the Employer's country **specified in the PCC,** the exchange rates used for calculating the amounts to be paid shall be the exchange rates stated in the Contractor's Bid.

49. Price Adjustment

49.1 Prices shall be adjusted for fluctuations in the cost of inputs only if **provided for in the PCC.** If so provided, the amounts certified in each payment certificate, before deducting for Advance Payment, shall be adjusted by applying the respective price adjustment factor to the payment amounts due in each currency. A separate formula of the type specified below applies to each Contract currency:

$$\mathbf{P_c = A_c + B_c\ Imc/Ioc}$$

where:

P_c is the adjustment factor for the portion of the Contract Price payable in a specific currency "c."

A_c and B_c are coefficients**specified in the PCC,** representing the nonadjustable and adjustable portions, respectively, of the Contract Price payable in that specific currency "c;" and

Imc is the index prevailing at the end of the month being invoiced and Ioc is the index prevailing 28 days before Bid opening for inputs payable; both in the specific currency "c."

49.2 If the value of the index is changed after it has been used in a calculation, the calculation shall be corrected and an adjustment made in the next payment certificate. The index value shall be deemed to take account of all changes in cost due to fluctuations in costs.

50. Retention

50.1 The Employer shall retain from each payment due to the Contractor the proportion **stated in the PCC** until Completion of the whole of the Works.

50.2 Upon the issue of a Certificate of Completion of the Works by the Project Manager, in accordance with GCC Sub-Clause 57.1, half the total amount retained shall be repaid to the Contractor and half when the Defects Liability Period has passed and the Project Manager has certified that all Defects notified by the Project Manager to the Contractor before the end of this period have been corrected. The Contractor may substitute retention money with an "on demand" Bank guarantee.

51. Liquidated Damages

51.1 The Contractor shall pay liquidated damages to the Employer at the rate per day **stated in the PCC** for each day that the Completion Date is later than the Intended Completion Date. The total amount of liquidated damages shall not exceed the amount **defined in the PCC.** The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor's liabilities.

51.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Project Manager shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in GCC Sub-Clause 45.1.

52. Bonus

52.1 The Contractor shall be paid a Bonus calculated at the rate per calendar day **stated in the PCC** for each day (less any days for which the Contractor is paid for acceleration) that the Completion is earlier than the Intended Completion Date. The Project Manager shall certify that the Works are complete, although they may not be due to be complete.

53. Advance Payment

53.1 The Employer shall make advance payment to the Contractor of the amounts **stated in the PCC** by the date **stated in the PCC,** against provision by the Contractor of an Unconditional Bank Guarantee in a form and by a bank acceptable to the Employer in amounts and currencies equal to the advance payment. The Guarantee shall remain effective until the advance payment has been repaid, but the amount of the Guarantee shall be progressively reduced by the amounts repaid by the Contractor. Interest shall not be charged on the advance payment.

53.2 The Contractor is to use the advance payment only to pay for Equipment, Plant, Materials, and mobilization expenses required specifically for execution of the Contract. The Contractor shall demonstrate that advance payment has been used in this way by supplying copies of invoices or other documents to the Project Manager.

53.3 The advance payment shall be repaid by deducting proportionate amounts from payments otherwise due to the Contractor, following the schedule of completed percentages of the Works on a payment basis. No account shall be taken of the advance payment or its repayment in assessing valuations of work done, Variations, price adjustments, Compensation Events, Bonuses, or Liquidated Damages.

54. Securities

54.1 The Performance Security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount **specified in the PCC,** by a bank or surety acceptable to the Employer, and denominated in the types and proportions of the currencies in which the Contract Price is payable. The Performance Security shall be valid until a date 28 days from the date of issue of the Certificate of Completion in the case of a Bank Guarantee, and until one year from the date of issue of the Certificate of Completion in the case of a Performance Bond.

55. Dayworks

55.1 If applicable, the Dayworks rates in the Contractor's Bid shall be used only when the Project Manager has given written instructions in advance for additional work to be paid for in that way.

55.2 All work to be paid for as Dayworks shall be recorded by the Contractor on forms approved by the Project Manager. Each completed form shall be verified and signed by the Project Manager within two days of the work being done.

55.3 The Contractor shall be paid for Dayworks subject to obtaining signed Dayworks forms.

56. Cost of Repairs

56.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Correction periods shall be remedied by the Contractor at the

Contractor's cost if the loss or damage arises from the Contractor's acts or omissions.

E. Finishing the Contract

57. Completion

57.1 The Contractor shall request the Project Manager to issue a Certificate of Completion of the Works, and the Project Manager shall do so upon deciding that the whole of the Works is completed.

58. Taking Over

58.1 The Employer shall take over the Site and the Works within seven days of the Project Manager's issuing a certificate of Completion.

59. Final Account

59.1 The Contractor shall supply the Project Manager with a detailed account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The Project Manager shall issue a Defects Liability Certificate and certify any final payment that is due to the Contractor within 56 days of receiving the Contractor's account if it is correct and complete. If it is not, the Project Manager shall issue within 56 days a schedule that states the scope of the corrections or additions that are necessary. If the Final Account is still unsatisfactory after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a payment certificate.

60. Operating and Maintenance Manuals

60.1 If "as built" Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates **stated in the PCC.**

60.2 If the Contractor does not supply the Drawings and/or manuals by the dates **stated in the PCC** pursuant to GCC Sub-Clause 60.1**,** or they do not receive the Project Manager's approval, the Project Manager shall withhold the amount **stated in the PCC** from payments due to the Contractor.

61. Termination

61.1 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.

61.2 Fundamental breaches of Contract shall include, but shall not be limited to, the following:

(a) the Contractor stops work for 28 days when no stoppage of work is shown on the current Program and the stoppage has not been authorized by the Project Manager;

(b) the Project Manager instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within 28 days;

(c) the Employer or the Contractor is made bankrupt or goes into liquidation other than for a reconstruction or amalgamation;

(d) a payment certified by the Project Manager is not paid by the Employer to the Contractor within 84 days of the date of the Project Manager's certificate;

(e) the Project Manager gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Project Manager;

(f) the Contractor does not maintain a Security, which is required;

(g) the Contractor has delayed the completion of the Works by the number of days for which the maximum amount of liquidated damages can be paid, as **defined in the PCC**; or

(h) if the Contractor, in the judgment of the Employer has engaged in Fraud and Corruption, as defined in paragraph 2.2 a of the Appendix A to the GCC, in competing for or in executing the Contract, then the Employer may, after giving fourteen (14) days written notice to the Contractor, terminate the Contract and expel him from the Site.

61.3 Notwithstanding the above, the Employer may terminate the Contract for convenience.

61.4 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as soon as reasonably possible.

61.5 When either party to the Contract gives notice of a breach of Contract to the Project Manager for a cause other than those listed under GCC Sub-Clause 61.2 above, the Project Manager shall decide whether the breach is fundamental or not.

62. Payment upon Termination

62.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Project Manager shall issue a certificate for the value of the work done and Materials ordered less advance payments received up to the date of the issue of the certificate and less the percentage to apply to the value of the work not completed, as **specified in the PCC.** Additional Liquidated Damages shall not apply. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be a debt payable to the Employer.

62.2 If the Contract is terminated for the Employer's convenience or because of a fundamental breach of Contract by the

Employer, the Project Manager shall issue a certificate for the value of the work done, Materials ordered, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works, and less advance payments received up to the date of the certificate.

63. Property

63.1 All Materials on the Site, Plant, Equipment, Temporary Works, and Works shall be deemed to be the property of the Employer if the Contract is terminated because of the Contractor's default.

64. Release from Performance

64.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Employer or the Contractor, the Project Manager shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all work carried out before receiving it and for any work carried out afterwards to which a commitment was made.

65. Suspension of Bank Loan or Credit

65.1 In the event that the Bank suspends the Loan or Credit to the Employer, from which part of the payments to the Contractor are being made:

(a) The Employer is obligated to notify the Contractor of such suspension within 7 days of having received the Bank's suspension notice.

(b) If the Contractor has not received sums due to it within the 28 days for payment provided for in GCC Sub-Clause 45.1, the Contractor may immediately issue a 14-day termination notice.

APPENDIX A
TO GENERAL CONDITIONS

Fraud and Corruption

(Text in this Appendix 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 (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 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;17 (ii) to be a nominated18 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[19] 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.

17 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.

18 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.

19 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.

APPENDIX B

Environmental and Social (ES) Metrics for Progress Reports

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

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.

Section IX -Particular Conditions of Contract

<table>
<tr><th colspan="2">A. General</th></tr>
<tr><td>GCC 1.1 (d)</td><td>The financing institution is: The World Bank</td></tr>
<tr><td>GCC 1.1 (r)</td><td>The Employer is The Chief Engineer, Water Resources Department</td></tr>
<tr><td>GCC 1.1 (v)</td><td>The Intended Completion Date for the whole of the Works shall be 24 months from the date of signing of contract</td></tr>
<tr><td>GCC 1.1 (y)</td><td>Employer has appointed the designated official of the WRD mentioned below to supervise the execution of the Works and administer the Contract. He will perform all roles and responsibilities assigned to the Project Manager in the GCC Section.
Designated official of WRD:
The Executive Engineer, Barpeta W.R Division and Chirang W.R Division</td></tr>
<tr><td>GCC 1.1 (aa)</td><td>The Site is located at Barpeta and Chirang District and is defined in drawings No. 1&2 (Page No 221-222)</td></tr>
<tr><td>GCC 1.1 (dd)</td><td>The Start Date shall be within 7 days of signing the Contract.</td></tr>
<tr><td>GCC 1.1 (hh)</td><td>The Works consist of
1) Below water bank protection works, including systematic dumping of geo-textile bags in apron in cratesof 9.00m width and 0.90M thickness in Beki River.
2) Above water bank protection works, including supplying and installing geotextile filters, and supplying and laying geobags in pitching in revetment, and supply of wire netting sheet and toe key in wire mesh.
3) Construction and launching of PSC porcupines
Identification number of Contract is
a) Identification Number of Contract, Lot-1 is WRD/WB/Beki Pkg 1/Lot1
b) Identification Number of Contract, Lot-2 is WRD/WB/Beki Pkg 1/Lot2</td></tr>
<tr><td>GCC 1.1 (jj)</td><td>GCC 1.1 (jj) is replaced with the following:
“Key Personnel are the Contractor’s personnel named in GCC 9.1 of the Particular Conditions of Contract.”</td></tr>
<tr><td>GCC 2.2</td><td>N/A</td></tr>
<tr><td>GCC 2.3(i)</td><td>The following documents also form part of the Contract:
<table>
<tr><td>S. No.</td><td>Document</td><td>Description of the document</td></tr>
</table>
</td></tr>
</table>

	1.	Construction Methodology	Construction methodology given in bid amended as per comments of Employer given in letter of acceptance.
	2.	Quality control	Quality control procedures and assurance plans given in the bid and amended as per comments of Employer given in letter of acceptance.
	3.	Fraud and Corruption	Appendix A toGeneral Conditions – Fraud and Corruption
	4.	Environmental and Social	Appendix B toGeneral Conditions - Environmental and Social (ES) Metrics for Progress Reports.
	5.	JV Agreement	Joint Venture Agreement (applicable if Contractor is aJV).

GCC 3.1	The following is inserted as a sub-clause at the end of GCC 3.1: "Salient features of major labour and other laws that are applicable to construction industry in India are given at the end of this PCC Sectionas Appendix 1." The language of the contract is *English.* The law that applies to the Contract are the laws of Union of India.
GCC 4.1	The following is inserted as a sub-paragraph at the end of GCC 4.1: "However, if the Project Manager is required, under the rules and regulations and orders of the Employer, to obtain approval of some other authorities for specific actions, he will so obtain the approval. Provided further that any requisite approval shall be deemed to have been given by the Employer for any such authority exercised by the Project Manager."
GCC 5.1	The Project manager may delegate any of his duties and responsibilities.
GCC 6.1	The following is inserted at the end of GCC 6.1: "All oral instructions shall be confirmed in writing in seven working days."
GCC 7.1	Subcontracting is allowed. Ceiling for sub-contracting is 25 % of the contract value. Hiding information about any sub-contracting not authorized by the Employer shall be treated as violation of Appendix A to General Conditions (Fraud and Corruption).
GCC 8.1	N/A
GCC 9	The following is inserted as a sub-clause at the end of GCC 9.2: "In all the above cases, the contractor shall ensure that the person leaves the site within seven days and has no further connection with the work in the contract. The Contractor shall appoint a suitable replacement within 28 days or earlier as may be agreed to between the Project Manager and the Contractor." The following sentence is deleted from first paragraph of GCC 9.4.1:

<table>
<tr><td></td><td>"The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labor with appropriate qualifications and experience from sources within the Country."

GCC 9.4.3 and GCC 9.4.4 are deleted.

The following sub-clauses are inserted at the end of GCC 9.4:

"9.5 The Contractor shall not employ any retired Gazetted officer who has either not completed two years after the date of retirement or has not obtained permission from the Government authorities for employment with the Contractor[20].

9.6 During continuance of the Contract, the Contractor and his Sub-Contractors shall abide at all times by all existing labour enactments and rules made there under, regulations, notifications and bye laws of the State or Central Government or local authority and any other labour laws (including rules), regulations, bye laws that may be passed or notification that may be issued under any labour law prevailing on the Base Date either by the State or the Central Government or the local authority. The Contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent authority on account of contraventions including amendments. If the Employer is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications/bye laws/Acts/Rules/regulations including amendments, if any, on the part of the Contractor, the Project Manager/ Employer shall have the right to deduct any money due to the Contractor including his amount of performance security and if applicable, the Environmental and Social (ES) Performance Security. The Employer/ Project Manager shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer.

9.7 The employees of the Contractor and the Sub-Contractor in no case shall be treated as the employees of the Employer at any point of time.

9.8 The Contractor shall duly comply with the provisions of the Apprentices Act 1961 (III of 1961) and the rules made there under, and the failure to comply, or neglect shall be subject to all liabilities and penalties provided in the said Act and Rules."</td></tr>
<tr><td>GCC 9.1</td><td>[Names of Key Personnel agreed by the Employer prior to Contract signature and the Schedule of Key Personnel along with their qualifications and equipment as indicated in accepted bid & construction methodology shall be inserted here in PCC.]</td></tr>
<tr><td>GCC 13.1</td><td>The minimum insurance amounts and deductibles shall be:

<table>
<tr><td>S.N.</td><td>Description</td><td>Minimum cover for Insurance</td><td>Maximum deductible for Insurance</td></tr>
<tr><td>(i)</td><td>Works and Plant and Materials</td><td>Contract Value</td><td>5% of the Contract Value</td></tr>
</table>
</td></tr>
</table>

[20]Based on Government Directives.

	(ii)	Loss or damage to Equipment	Total book value of the equipment brought to the site by the contractor	5% of the figure in the preceding column.
	(iii)	Other Property (except the Works, Plant, Materials, and Equipment)	Rs.1,00,00,000.00	Rs. 200,000.00
	(iv)	Personal injury or death insurance: (a) for other people;	As per Workmen's Compensation Act 1923 and other Acts in force.	As per Workmen's Compensation Act 1923 and other Acts in force.
		(b) for Contractor's Employees	In accordance with the statutory requirements applicable in India	

GCC 14.1	Site Data: are: The Site is located at Barpeta and Chirrang District. Site data is available are available under section VII-Works requirement & drawing of this bidding document
GCC 15.1	GCC 15.1 is replaced with the following: "The Contractor shall construct and install the Works in accordance with the Specifications and Drawings and as per instructions of Project Manager."
GCC 18 (add new sub-clause 18.3.3)	The following is inserted as a new sub-clause 18.3.3: "18.3.3 During continuance of the contract, the contractor and his sub-contractors shall abide at all times by all existing enactments on environmental protection and rules made thereunder, regulations, notifications and by-laws of the State or Central Government, or local authorities and other law, bye-law, regulations that may be passed or notification that may be issued in this respect in future by the State or Central Government or the local authority. Salient features of the major laws are given in Appendix 1 to the General Conditions of Contract."
GCC 20.1	GCC 20.1 is replaced with the following: "The Employer shall give possession of minimum 80% of the Site to the Contractor within 7 (seven) days of the signing of the contract, and possession of balance site shall be handed over by the date **stated in the PCC.** If possession of a part is not given by the date **stated in the PCC,** the Employer shall be deemed to have delayed the start of the relevant activities, and this shall be a Compensation Event."
GCC 20.1	The Contractor shall take possession of 80% of the site within 7 (seven) days of the signing of the contract and start the work in consultation with site engineers. Balance site shall be handed over to the Contractor on or before completion of 50% of the contracted work in terms of value.
GCC 23	The following is inserted as a new sub-clause 23.1.1:

	"23.1.1 The Adjudicator should be in position before "notice to proceed with work" is issued to the Contractor and an agreement should be signed with the Adjudicator jointly by the Employer and the Contractor in the form attached – Appendix 2."
GCC 23.1 & GCC 23.2	Name of the agreed Adjudicator …….. *(insert name before signing contract)* Appointing Authority for the Adjudicator: President of the Institution of Engineers (India)
GCC 24	In the first sentence in GCC 24.3, the text "The Adjudicator shall be paid by the hour at the rate" is replaced by the text "The Adjudicator shall be paid daily at the rate"
GCC 24.3	Daily rate and types of reimbursable expenses to be paid to the Adjudicator are: Fees of Rs20,000.00 per day of effective hearing, plus reimbursable expenses, namely actual boarding, lodging, travel and other incidental expenses.
GCC 24.4	The procedure for adhoc arbitration will be as follows: (a) In case of Dispute or difference arising between the Employer and a Contractor relating to any matter arising out of or connected with this agreement, such disputes or difference shall be settled in accordance with the Arbitration and Conciliation Act, 1996. The arbitral tribunal shall consist of 3 Arbitrators one each to be appointed by the Employer and the Contractor. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the Parties and shall act as Presiding Arbitrator. In case of failure of the two Arbitrators appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the Arbitrator appointed subsequently the Presiding Arbitrator shall be appointed by the President of the Institution of Engineers (India). (b) If one of the parties fails to appoint its Arbitrator in pursuance of sub-clause (a) above within 30 days after receipt of the notice of the appointment of its Arbitrator by the other party, then the President of the Institution of Engineers (India) shall appoint the Arbitrator. A certified copy of the order of the President of the Institution of Engineers (India), making such an appointment shall be furnished to each of the parties. (c) Arbitration may be commenced prior to or after completion of the Works, provided that the obligations of the Employer, the Project Manager, the Contractor and the Adjudicator shall not be altered by reason of the arbitration being conducted during the progress of the Works. (d) Arbitration proceedings shall be held at Guwahati, and the language of the arbitration proceedings and that of all documents and communications between the parties shall be English. (e) The decision of the majority of Arbitrators shall be final and binding upon both parties. The cost and expenses of Arbitration proceedings will be paid as determined by the arbitral tribunal. However, the expenses incurred by each party in connection with the preparation, presentation, etc. of its proceedings as also the fees and expenses paid to the Arbitrator appointed by such party or on its behalf shall be borne by each party itself.

	(f) The Arbitrator should give final award within 120 days of starting of the proceedings. (g) Performance under the contract shall continue during the arbitration proceedings and payments due to the contractor by the Employer shall not be withheld, unless they are the subject matter of the arbitration proceedings.
B. Time Control	
GCC 30.1	The Contractor shall submit for approval a Program for the Works within 14 days of delivery of the Letter of Acceptance. Any revision in Program should only be agreed in writing.
GCC 30.3	The period between Program updates is 30 days. The amount to be withheld for late submission of an updated Program is Rs 5,00,000.00 The period for submission of progress reports is *30* days.
GCC 31	GCC 31.1 is replaced with the following: "31.1 The Project Manager shall extend the Intended Completion Date if a Compensation Event occurs or a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining work, which would cause the Contractor to incur additional cost." In GCC 31.2, replace the words "Intended Completion Date" at the first occurrence by the words "Intended Completion Date"; and at the second occurrence by the words "Intended Completion Date".
GCC 34	GCC 34.1 is replaced with the following: "Either the Project Manager or the Contractor may require the other to attend a management meeting (which will be held at the place **indicated in PCC**. The periodicity shall be fixed by Project Manager/ Contractor jointly). The business of a management meeting shall be to review the progress of construction with reference to the construction program given in accordance with GCC 30.1, the plans for remaining work and to deal with matters raised in accordance with the early warning procedure."
GCC 34.1	Venue of management meeting will be Office of the Executive Engineer, Barpeta W.R Division and Chirrang WR Division. The management meetings shall be held at intervals of 14 days.
C. Quality Control	
GCC 36	The following sub-clause is inserted at the end of GCC 36.1: "36.2 The contractor shall permit the Employer's Technical auditor to check the contractor's work and notify the Project Manager and Contractor of any defects that are found.

	Such a check shall not affect the Contractor's or the Project Manager's responsibility as defined in the Contract Agreement."
GCC 37	The following sub-clauses are inserted before GCC 37.1, and GCC 37.1 is re-numbered as GCC 37.3: "GCC 37.1 The Contractor shall institute Quality Assurance (QA) and Quality Control (QC) systems in accordance with Quality Assurance Plan to demonstrate compliance with the requirements of the Contract as approved by the Project Manager. Compliance with the QA/QC systems shall not relieve the Contractor of any of his duties obligations or responsibilities under the Contract. GCC 37.2 The Contractor shall provide all apparatus, assistance, documents and other information, electricity, equipment, fuel, consumables, instruments, labour, materials, and suitably qualified and experienced staff, as are necessary to carry out the specified tests efficiently."
GCC 38.1	The Defects Liability Period is: 365 days.
GCC 39.1	The following notes are added at the end of GCC 39.1: ***"Note: 1. Where in certain cases, the technical specifications provide for acceptance of works within specified tolerance limits at reduced rates, Project Manager will certify payments to Contractor accordingly.*** ***2. Where the failure to correct a particular defect within the specified time is considered as a fundamental breach of contract a notice should be given to the contractor as stated in GCC 61.2(e)."***
D. Cost Control	
GCC 41	GCC 41.1 is replaced with the following, and existing GCC 41.2 is re-numbered as GCC 41.3: "41.1 If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 25 percent, provided the change exceeds 1 percent of the Initial Contract Price, the Project Manager shall adjust the rate to allow for the change. (a) If the quantity of work executed exceeds the quantity of the item in BOQ beyond the higher specified limit the Project Manager shall fix the rate to be applied for the additional quantity of the work executed. (b) If the quantity of work executed is less than the quantity of the item in BOQ and is lesser than the lower specified limit, the Project Manager shall fix the rate to be applied for whole of the quantity of the work so executed 41.2 The Project Manager shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 15 percent, except with the prior approval of the Employer."
GCC 42	In GCC 42.2, the first sentence is modified as follows: "The Contractor shall provide the Project Manager with a quotation (with breakdown of unit rates) for carrying out the Variation when requested to do so by the Project Manager. The

	Contractor shall also provide 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." In the first sentence in GCC 42.3, after the words 'If the Contractor's quotation is unreasonable', the following is added: "or if contractor fails to provide the Project Manager with a quotation within a reasonable time specified by Project Manager in accordance with GCC 42.2."
GCC 42.7	Provisions related to Value Engineering do not apply.
GCC 43.1	The second sentence in GCC 43.1 is replaced with the following: "The cash flow forecast shall be in Indian Rupees."
GCC 44	At the end of GCC 44.1 after the word 'previously', the following words are added: "along with details of measurement of the quantity of works executed in a tabular form approved by the Project Manager" At the end of GCC 44.2 after the words 'the Contractor', the following words are added: "after taking into account any credit or debit for the month in question in respect of materials for the works in the relevant amount and under conditions set forth in GCC Sub-Clause 53.1 (Secured Advance)"
GCC 45	GCC 45.1 is replaced with the following: "Payments shall be adjusted for deductions for advance payments, retention, other recoveries in terms of contract & taxes to be deducted at source [TDS] as per applicable law. The Employer shall pay the Contractor the amounts certified by the Project Manager within 28 days of the date of each certificate. If the Employer makes a late payment, the Contractor shall be paid interest on the late payment in the next payment. Interest shall be calculated from the date by which the payment should have been made up to the date when the late payment is made at the rate **stated in the PCC**." A new sub-clause 45.5 is added after sub-clause 45.4: "45.5 The Contractor shall open an Escrow Account with his bank for the purpose of receiving all the payments as well as incurring expenditure under this Contract. The Account shall be open to verification and audit at any time by the Employer or designee of the Employer. This account will be controlled solely by the Contractor's Project Officers (Project Manager and/or Finance Manager or equivalent designate). No other Contractor employees or associates will have access to the Project Account or the funds therein. The Contractor shall report monthly on the status of this account including actual bank account statements. The Contractor shall provide all Account statements as requested by the Employer."
GCC 45.1	Interest rate for Delayed payment is 6% per annum
GCC 45.3	All payments (and deductions) shall be paid or charged in Indian Rupees.
GCC 47	The following sub-clause is inserted before GCC 47.1, and GCC 47.1 is re-numbered as GCC 47.2:

	"47.1 The rates quoted by the Contractor shall be deemed to be inclusive of the VAT, Sales and other taxes that the Contractor will have to pay for the performance of this Contract. The Employer will perform such duties in regard to the deduction of such taxes at source [TDS] as per applicable law." In first line of the re-numbered GCC 47.2, replace the words 'the date 28 days before' with the words 'the deadline for'.
GCC 48	All payments shall be made in Indian Rupees.
GCC 49	GCC 49.1 is replaced with the following: "Contract price shall be adjusted for increase or decrease in rates and price of labour, materials, fuels and lubricants and other inputs to the works in accordance with the principles and procedures outlined below. A table of adjustment data is included in the PCC which indicates the coefficients of various inputs and the sources of indices for various schedules of BOQ. If the PCC does not include a table of adjustment data this sub clause shall not apply and there shall be no price adjustment. (a) The price adjustment according to sub para (d) below, shall apply for the work done from the start date given in the PCC up to the end of the Intended Completion Date. If there is delay in completion beyond such date for reasons attributable to the contractor, the Price Adjustment for the work carried out during such period, for reasons attributable to the Contractor, shall be regulated by sub-para (g) below. (b) The Contract Price shall be adjusted to take account of any increase or decrease in costs after the base date, which affect the Contractor in performance of obligations under the Contract. (c) The total value (R) of the work done during the specified period [GCC 44.1] shall be as under: R= SUM (RS1 + RS2 + RS3 + …….RSn), Where, 'Rsn' is the value of work done during the specified period to which the price adjustment shall be applied for the relevant schedule of Bill of Quantities (BOQ) specified in P.C.C during the specified period, and represented as under: Rsn = (Vsn + Ssn) minus (amount of secured advance recovered in the same period + value of works executed under variations for which price adjustments will be worked separately based on terms mutually agreed between the Project Manager and the Contractor) where, Vsn is the total value of work done during the specified period for the respective schedule of BOQ, and Ssn is the secured advance paid during the specified period for the respective schedule of BOQ,

(d) The adjustment to be applied to the amount otherwise payable to the Contractor, as valued in accordance with the appropriate schedule of BOQ and certified in Payment Certificates, shall be determined from formulae which 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 value of the work done during the period "n", this period being a month unless otherwise stated in the PCC.

"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" [Labour], "En"[Equipment], "Mn"[Material], …. are the current cost indices or reference prices for period "n", each of which is applicable to the relevant tabulated cost element [Labour, Equipment, Steel, Cement, Fuel/Lubricants, Bitumen, others] on the date, specified in the Table-2 of Adjustment Data, 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.

(e) The cost indices or reference prices stated in the adjustment data given in the following Clause in PCC shall be used. The base date shall be the deadline for submission/uploading of bids.

(f) If the Contractor fails to complete the Works within the Intended Completion date, adjustment of prices thereafter shall be made using either:

(i) index or price applicable for each cost element tabulated in the adjustment data on the specified date prior to the expiry of the Intended Completion Date, or

(ii) the current index or price applicable for the period in question whichever is more favourable to the Employer.

(g) The weightings (coefficients) for each of the factors of cost stated in the adjustment data shall only be varied by the Project Manager if they have been rendered unreasonable, unbalanced or inapplicable, as a result of Variations.

(h) Unless otherwise stated in the P.C.C., the Price adjustment shall be done in each monthly Interim Payment Certificate [IPC]. The coefficients and indices are given in the Tables of Adjustment Data in P.C.C.

To the extent that full compensation for any rise or fall in costs to the contractor is not covered by the provisions of this or other clauses in the contract, the unit rates and prices included in the contract shall be deemed to include amounts to cover the contingency of such other rise or fall in costs."

GCC 49.1	Adjustment Data The contract is subject to Price Adjustment in accordance with G.C.C. Clause 49 and following information/data relating to Price Adjustment shall be applicable. Base Date for Price Adjustment = Deadline for submission/uploading of bids Adjustment to be applied to the amount otherwise payable to the Contractor, as referred to in sub-paragraph (d) in the GCC Clause, during the period n to which the Interim Payment Certificate (IPC) relates, and which will be certified in Payment Certificates shall be determined using the following formula: Pn = 0.15 + 0.17Ln/Lo + 0.35 SFn/SFo + 0.04 PsCn/PsCo + 0.06 DSLn/DSLo + 0.23 WNn/WNo Where Pn = Adjustment multiplier to be applied to the value of the work done during the period "n" [GCC 44.1], this period being a month unless otherwise stated in the PCC. Ln and Lo = all India average Consumer Price Index (CPI) for Industrial Workers with base 2016 = 100 for the State of Assam for Guwahati Centre, for the Period n and the Base Date respectively, published by Labour Bureau, Ministry of Labour and Employment, Government of India; SFn and SFo = Wholesale Price Index (with base 2011-12 = 100) for "Synthetic Fabrics and Others" for the month in which the geobags and geo-sheets are brought to site or one month prior to the month to which IPC is related, whichever is less, and the Base Date respectively, published by Economic Advisor, Ministry of Commerce and Industry, Government of India; PsCn and PsCo = Wholesale Price Index (with base 2011-12 = 100) for "Poles and posts of concrete" for the month in which the porcupines are brought to site or one month prior to the month to which IPC is related, whichever is less, and the Base Date respectively, published by Economic Advisor, Ministry of Commerce and Industry, Government of India; DSLn/DSLo = Diesel price per unit in IOC's Depot in Guwahati on the first day of the month to which the IPC relates and the Base Date respectively; WNn and WNo = Wholesale Price Index (with base 2011-12=100) for "Manufacturing of fabricated metal product except machinery and equipments" for the month in which the wire netting crates are brought to site or one month prior to the month to which IPC is related, whichever is less, and the Base Date respectively, published by Economic Advisor, Ministry of Commerce and Industry, Government of India.
GCC 50.1	The proportion of payments retained (Retention Money) shall be 6% from each bill subject to the maximum of 5% of final contract price.
GCC 50.2	The last line of GCC 50.2 is replaced with the following: "On completion of the whole works the Contractor may substitute the balance retention money with an "on demand" Bank guarantee."
GCC 51	In the first sentence of GCC 51.1, the following words are inserted after the words 'Intended Completion Date':

<table>
<tr><td></td><td>"(for the whole of the works or the milestones as stated in the PCC)"

The following is inserted as a sub-paragraph at the end of GCC 51.1:

"Time is the essence of the contract and payment or deduction of liquidated damages shall not relieve the contractor from his obligation to complete the work as per agreed construction program and milestones, or from any of the Contractor's other obligations and liabilities under the contract."</td></tr>
<tr><td>GCC 51.1</td><td>The liquidated damages for the whole of the Works are 0.05% per day. The maximum amount of liquidated damages for the whole of the Works is 10% of the final Contract Price.</td></tr>
<tr><td>GCC 52.1</td><td>N/A</td></tr>
<tr><td>GCC 53</td><td>The following is inserted as a new sub-clause 53.4:

"The Project Manager shall make advance payment in respect of materials intended for but not yet incorporated in the Works in accordance with conditions stipulated in the PCC."</td></tr>
<tr><td>GCC 53.1</td><td><u>Advance Payments shall be made in Indian Rupees only. The amount of the Advance Payments is:</u>
<table>
<tr><td><u>Nature of Advance</u></td><td><u>Amount (Rs.)</u></td><td><u>Conditions to be fulfilled</u></td></tr>
<tr><td>1. Mobilization</td><td>5% of the Contract price</td><td>On submission of un-conditional Bank Guarantee. (to be drawn before end of 20% of Contract period)</td></tr>
<tr><td>2. Equipment

(This advance is not applicable for equipment already owned or hired/leased by the contractor.)</td><td>90% for new and 50% of depreciated value for old equipment. Total amount will be subject to a maximum of 5% of the Contract price.</td><td>After equipment is brought to site as per agreed construction program (provided the Project Manager is satisfied that the equipment is required for performance of the contract) and on submission of unconditional Bank Guarantee for amount of advance.</td></tr>
<tr><td>3. Secured advance for non-perishable materials brought to site [Specify the item or items for which this will be given here]</td><td>75% of Invoice value or Market value –lower of the two.</td><td>a) The materials are in-accordance with the specification for Works;

b) Such materials have been delivered to site, and are properly</td></tr>
</table></td></tr>
</table>

				stored and protected against damage or deterioration to the satisfaction of the Project Manager. c) the Contractor's records of the requirements, orders, receipt and use of materials are kept in a form approved by the Project Manager and such records shall be available for inspection by the Project Manager; d) The contractor has submitted with his monthly statement the estimated value of the materials on site together with such documents as may be required by the Project Manager for the Purpose of valuation for material and providing evidence of ownership and payment thereof; e) Ownership of such materials shall be deemed to vest in the Employer for which the Contractor has submitted an Indemnity Bond in an acceptable format; and f) The quantity of materials are not excessive and shall be used within a reasonable time as determined by the Project Manager.	

	The advance payment will be paid to the Contractor no later than 15 days after fulfilment of the above conditions. Repayment of advance payment for mobilization and equipment: The advance shall be repaid with percentage deductions from the interim payments certified by the Project Manager under the Contract. Deductions shall commence in the next Interim Payment Certificate following that in which the total of all such payments to the contractor has reached not less than 15 percent of the Contract Price or 2 months from the date of payment of first instalment of advance, whichever period concludes earlier, and shall be made at the rate of 15 percent of the amounts of all Interim Payment Certificates until such time as the advance has been repaid, always provided that the advance shall be completely repaid prior to the expiry of the original time for completion. **Repayment of secured advance**: The advance shall be repaid from each succeeding monthly payments to the extent materials *[for which advance was previously paid pursuant to Clause 53 of GCC and 53.1(3) of PCC.]* have been incorporated into the Works. The amount of the Bank Guarantee(s) may be progressively reduced by the amounts repaid by the Contractor, each instalment not less than Rs. 500,000.
GCC 54	GCC 54.1 is replaced with the following: "The Performance Security and an Environmental and Social (ES) Performance Security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in the amounts **specified in the PCC**, and shall be issued by a Nationalized or Scheduled bank in India. The Performance Security including additional security for unbalanced bids, and the ES Performance Security, shall be valid until a date 28 days from the date of issue of the Certificate of Completion."
GCC 54.1	The Performance Security amount is 4 percent of the Accepted Contract Amount and Environmental and Social (ES) Performance Security amount is 1 percent of the Accepted Contract Amount The standard forms of Performance Security and if applicable ES Security acceptable to the Employer shall be unconditional Bank Guarantees from Scheduled or Nationalized banks in India of the types as presented in Section X of the Bidding Document. Throughout this bidding document the term 'performance security', unless the context clearly indicates otherwise, means and includes both 'the performance security and the ES performance security' to be submitted by the successful bidder in the amounts specified above.
E. Finishing the Contract	
GCC 59.1	The following is added after the words 'issue a payment certificate' at the end of GCC 59.1: "within 56 days of receiving the contractor's revised account"
GCC 60.1	The date by which operating and maintenance manuals are required is within 28 days of issue of certificate of completion of whole or section of work, as the case may be.

	The date by which "as built" drawings (in scale1:250) including a compact disc containing digitized drawings in 2 sets are required, is within 28 days of issue of certificate of completion of whole or section of the work, as the case may be.
GCC 60.2	The amount to be withheld for failing to produce "as built" drawings and/or operating and maintenance manuals by the date required in GCC 60.1 is Rs. 5,00,000
GCC 61	The following sub-clauses are added after GCC 61.2 (h): "(i) The contractor has contravened Clauses 7 and 9 of GCC. (j) The contractor does not adhere to the agreed construction program, agreed ES-MSIP [Clause 30 of GCC], and also fails to take satisfactory remedial action as per agreements reached in the management meetings [Clause 30 of GCC] for a period of 60 days. (k) The contractor fails to carry out the instructions of the Project Manager within a reasonable time determined by the Project Manager in accordance with GCC Clause 15.1 and 22. (l) The contractor (in case of Joint Venture) has modified the composition of the joint venture and/or the responsibility of each member of the joint venture from what is stated in joint venture agreement without the prior approval of the Employer."
GCC 61.2 (g)	The maximum number of days is: 200 days
GCC 61.2(l)	Hiding any information regarding changes in roles and responsibilities of JV members, which is not authorized by the Employer, shall also be treated as violation of Appendix A to General Conditions (Fraud and Corruption).
GCC 62	The following is added after the words 'issue of the certificate' in the first sentence of GCC 62.1; "less other recoveries due in terms of contract, less taxes to be deducted at source [TDS] as per applicable law," The following is added after the words 'date of the certificate' at the end of GCC 62.2: "less other recoveries due in terms of contract, less taxes to be deducted at source [TDS] as per applicable law"
GCC 62.1	The percentage to apply to the value of the work not completed, representing the Employer's additional cost for completing the Works, is 20%.

Appendix 1

Salient Features of Labour & Environment Protection Laws[21]

SALIENT FEATURES OF SOME MAJOR LABOUR LAWS APPLICABLE TO ESTABLISHMENTS ENGAGED IN BUILDING AND OTHER CONSTRUCTION WORK

(a) Employees Compensation Act 1923: The Act provides for compensation in case of injury, disease or death arising out of and during the course of employment.

(b) Payment of Gratuity Act 1972: gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years' service or more or on death at the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.

(c) Employees P.F. and Miscellaneous Provision Act 1952 (*since amended*): The Act provides for monthly contribution by the employer plus workers @ 10% or 8.33%. The benefits payable under the Act are:

(i) Pension or family pension on retirement or death, as the case may be.
(ii) Deposit linked insurance on the death in harness of the worker.
(iii) Payment of P.F. accumulation on retirement/death etc.

(d) Maternity Benefit Act 1961: The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.

(e) Sexual Harassment of Women at the Workplace (Prevention, Prohibition and Redressal) Act, 2013: This Act defines sexual harassment in the workplace, provides for an enquiry procedure in case of complaints and mandates the setting up of an Internal Complaints Committee or a Local Complaints Committee

(f) Contract Labour (Regulation & Abolition) Act 1970: The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided, by the Principal Employer by law. The Principal Employer is required to take Certificate of Registration and the Contractor is required to take license from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Employer if they employ 20 or more contract labour.

(g) Minimum Wages Act 1948: The Employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of Buildings, Roads, Runways are scheduled employments.

(h) Payment of Wages Act 1936: It lays down the mode, manner and by what date the wages are to be paid, what deductions can be made from the wages of the workers.

[21]This list is only illustrative and not exhaustive. Bidders and Contractors are responsible for checking the correctness and completeness of the list. The law as current on the date of bid opening will apply.

(i) Equal Remuneration Act 1976: The Act provides for payment of equal wages for work of equal nature to male and female workers and for not making discrimination against Female employees in the matters of transfers, training and promotions etc.

(j) Payment of Bonus Act 1965: The Act is applicable to all establishments employing 20 or more employees. Some of the State Governments have reduced this requirement from 20 to 10. The Act provides for payments of annual bonus subject to a minimum of 8.33% of the wages drawn in the relevant year. It applies to skilled or unskilled manual, supervisory, managerial, administrative, technical or clerical work for hire or reward to employees who draw a salary of Rs. 10,000/- per month or less. To be eligible for bonus, the employee should have worked in the establishment for not less than 30 working days in the relevant year. The Act does not apply to certain establishments.

(k) Industrial Disputes Act 1947: the Act lays down the machinery and procedure for resolution of Industrial disputes, in what situations, a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

(l) Trade Unions Act 1926: The Act lays down the procedure for registration of trade unions of workmen and employers. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.

(m) Child Labour (Prohibition & Regulation) Act 1986: The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of Child Labour is prohibited in the Building and Construction Industry.

(n) Inter-State Migrant workmen's (Regulation of Employment & Conditions of Service) Act 1979: The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter-State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home upto the establishment and back, etc.

(o) The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996 and the Building and Other Construction Workers Welfare Cess Act, 1996 (BOCWW Cess Act): All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under these Acts. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be notified by the Government. The Employer of the establishment is required to provide safety measures at the building or construction work and other welfare measures, such as Canteens, First – Aid facilities, Ambulance, Housing accommodations for workers near the work place etc. The Employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

(p) Factories Act 1948: the Act lays down the procedure for approval of plans before setting up a factory engaged in manufacturing processes, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power.

(q) Weekly Holidays Act -1942

(r) Bonded Labour System (Abolition) Act, 1976: The Act provides for the abolition of bonded labour system with a view to preventing the economic and physical exploitation of weaker sections of society. Bonded labour covers all forms of forced labour, including that arising out of a loan, debt or advance.

(s) Employer's Liability Act, 1938: This Act protects workmen who bring suits for damages against employers in case of injuries endured in the course of employment. Such injuries could be on account of negligence on the part of the employer or persons employed by them in maintenance of all machinery, equipment etc. in healthy and sound condition.

(t) Employees State Insurance Act 1948: The Act provides for certain benefits to insured employees and their families in case of sickness, maternity and disablement arising out of an employment injury. The Act applies to all employees in factories (as defined) or establishments which may be so notified by the appropriate Government. The Act provides for the setting up of an Employees' State Insurance Fund, which is to be administered by the Employees State Insurance Corporation. Contributions to the Fund are paid by the employer and the employee at rates as prescribed by the Central Government. The Act also provides for benefits to dependents of insured persons in case of death as a result of an employment injury.

(u) The Personal Injuries (Compensation Insurance) Act, 1963: This Act provides for the employer's liability and responsibility to pay compensation to employees where workmen sustain personal injuries in the course of employment.

(v) Industrial Employment (Standing Order) Act 1946: It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and get the same certified by the designated Authority.

SALIENT FEATURES OF SOME OF THE MAJOR LAWS THAT ARE APPLICABLE FOR PROTECTION OF ENVIRONMENT.

1. The Environment (Protection) Act, 1986 and as amended: This provides for the protection and improvement of environment and for matters connected therewith, and the prevention of hazards to human beings, other living creatures, plants and property. 'Environment' includes water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property.

2. The Forest Conservation Act, 1980, as amended, and Forest (Conservation) Rules, 1981 as amended: These provides for protection of forests by restricting conversion of forested areas into non- forested areas and prevention of deforestation, and stipulates the procedures for cutting any trees that might be required by the applicable rules. Permissions under the Act also stipulates the norms and compliance requirements of the employer and any contractor on behalf of the employer.

3. State Tree Preservation Acts as may be in force: These provide for protection of trees of important species. Contractors will be required to obtain prior permission for full or partial cutting, uprooting, or pruning of any such trees.

4. The Wildlife (Protection) Act, 1972, and as amended: This provides for protection of wildlife through notifying National Parks and Sanctuaries and buffer areas around these zones; and to protect individuals of nationally important species listed in the Annex of the Act.

5. The Biological Diversity Act, 2002: This provides for conservation of biological diversity, sustainable use of components of biological diversity, and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith or incidental thereto.

6. The Public Liability Insurance Act, 1991 as amended and The Public Liability Insurance Rules, 1991 as amended: These provide for public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling hazardous substances and for mattes connected herewith or incidental thereto. Hazardous substance means any substance or preparation which is defined as hazardous substance under the Environment (Protection) Act 1986, and exceeding such quantity as may be specified by notification by the Central Government.

7. The Ancient Monuments and Archaeological Sites and Remains Act, 1958 and the Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010, the Ancient Monuments and Archaeological Sites and Remains Rules, 1959 amended 2011, the National Monuments Authority Rules, 2011 and the similar State Acts: These provide for conservation of cultural and historical remains found in India. Accordingly, area within the radii of 100m and 300m from the "protected property" are designated as "protected area" and "controlled area" respectively. No development activity (including building, mining, excavating, blasting) is permitted in the "protected area" and development activities likely to damage the protected property is not permitted in the "controlled area" without prior permission of the Archaeological Survey of India (ASI) or the State Departments of Art and Culture or Archaeology as applicable.

8. The Environmental Impact Assessment Notification, 2006 and as amended: This provides for prior environmental clearance for new, modernization and expansion projects listed in

Schedule 1 of the Notification. Contractors will be required to ensure that no work starts until applicable clearances under the Notification is not available. Contractors will be responsible for implementation of any environmental management plan stipulated as per the permission under this Notification; and will be required to prepare and submit to the employer and compliance report stipulated in the permission under the Notification.

9. The Water (Prevention and Control of Pollution) Act, 1974 as amended, and the Water (Prevention and Control of Pollution) Rules, 1975 as amended: These provide for the prevention and control of water pollution and the maintaining and restoring of wholesomeness of water. 'Pollution' means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance into water(whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms. Contractors will need to obtain consent for establishment and consent for operation of any item of work or installation of equipment that generates waste water, and observe the required standards of establishment and operation of these items of work or installations; as well as install and operate all required waste water treatment facilities.

10. The Water (Prevention and Control of Pollution) Cess Act, 1977 and The Water (Prevention and Control of Pollution) Cess Rules, 1978: These provide for the levy and collection of a cess on water consumed by persons carrying on certain industries and by local authorities, with a view to augment the resources of the Central Board and the State Boards for the prevention and control of water pollution under the Water (Prevention and Control of Pollution) Act, 1974.

11. The Air (Prevention and Control of Pollution) Act, 1981 as amended, and the Air (Prevention and Control of Pollution) Rules, 1982: These provides for prevention, control and abatement of air pollution. 'Air Pollution' means the presence in the atmosphere of any 'air pollutant', which means any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment. Contractors will need to obtain consent for establishment and consent for operation of any item of work or installation of equipment that generates air pollution such as batching plants, hot mix plants, power generators, backup power generation, material handling processes, and observe the required standards of establishment and operation of these items of work or installations.

12. Noise Pollution (Control and Regulation) Rules, 2000, and as amended: This provides for standards for noise for day and night for various land uses and specifies special standards in and around sensitive receptors of noise such as schools and hospitals. Contractors will need to ensure compliance to the applicable standards, and install and operate all required noise control devices as may be required for all plants and work processes.

13. Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996: This provides for Requirement of preparation of on-site and off-site Disaster Management Plans for accident-prone areas.

14. The Explosives Act 1884 and the Explosives Rules, 2008: These provide for safe manufacture, possession, sale, use, transportation and import of explosive materials such as diesel, Oil and

lubricants etc.; and also for regulating the use of any explosives used in blasting and/or demolition. All applicable provisions will need compliance by the contractors.

15. The Petroleum Rules, 2002: This provides for safe use and storage of petroleum products, and will need to be complied by the contractors.

16. The Gas Cylinder Rules 2004 and amendments: This provides for regulations related to storage of gas, and possession of gas cylinder more than the exempted quantity. Contractors should comply with all the requirements of this Rule.

17. Manufacture, Storage and Import of Hazardous Chemical Rules of 1989 and as amended: These provide for use and storage of hazardous material such as highly inflammable liquids like HSD/LPG. Contractors will need to ensure compliance to the Rules; and in the event where the storage quantity exceeds the regulated threshold limit, the contractors will be responsible for regular safety audits and other reporting requirements as prescribed in the Rules.

18. Hazardous & Other Wastes (Management and Transboundary Movement) Rules, 2016: These provide for protection of general public from improper handling storage and disposal of hazardous waste. The rules prescribe the management requirement of hazardous wastes from its generation to final disposal. Contractors will need to obtain permission from the State Pollution Control Boards and other designated authorities for storage and handling of any hazardous material; and will to ensure full compliance to these rules and any conditions imposed in the permit.

19. The Bio Medical Waste Management Rules, 2016: This provides for control, storage, transportation and disposal of bio-medical wastes. As and where the contractor has any first aid facility and dispensaries, established in either temporary or permanent manner, compliance to these Rules are mandatory.

20. Construction and Demolition Waste Management Rules, 2016: This provides for management of construction and demolition waste (such as building materials possible to be reused, rubble and debris or the like); and applies to all those waste resulting from construction, re-modelling, repair or demolition of any civil structure. Contractor will need to prepare a waste disposal plan and obtain required approval from local authorities, if waste generation is more than 20 tons in any day or 300 tons in any month during the contract period; and ensure full compliance to these rules and any conditions imposed in the regulatory approval.

21. The E-Waste (Management) Rules, 2016: This provides for management of E-wastes (but not covering lead acid batteries and radio-active wastes) aiming to enable the recovery and/or reuse of useful material from e-waste, thereby reducing the hazardous wastes destined for disposal and to ensure the environmentally sound management of all types of waste of electrical and electronic equipment. This Rule applies to every manufacturer, producer, consumer, bulk consumer, collection centers, dealers, e-retailer, refurbisher, dismantler and recycler involved in manufacture, sale, transfer, purchase, collection, storage and processing of e-waste or electrical and electronic equipment listed in Schedule I, including their components, consumables, parts and spares which make the product operational.

22. Plastic waste Management Rules, 2016: This provides for control and management of the plastic waste generated from any activity. Contractors will ensure compliance to this Rule.

23. The Batteries (Management and Handling) Rules 2001: This provides for ensuring safe disposal and recycling of discarded lead acid batteries likely to be used in any equipment during construction and operation stage. Rules require proper control and record keeping on the sale or import of lead acid batteries and recollection of the used batteries by registered recyclers to ensure environmentally sound recycling of used batteries. Contractors will ensure compliance to this Rule.

24. The Ozone Depleting Substances (Regulation and Control) Rules, 2000 and as amended: This provides for regulation of production and consumption of ozone depleting substances in the country, and specifically prohibits export to or import from countries not specified in the Rules, and prohibits unless specifically permitted, any use of ozone depleting substance.

25. The Coastal Regulation Zone Notifications, 1991 and as amended: This provides for regulation of development activities within the 500m of high tide line in coastal zone and 100m of stretches of rivers and estuaries influenced by tides. Contractors will be required to ensure that no work starts until applicable clearances under the Notification is not available. Contractors will be responsible for implementation of any plan stipulated as per the permission under this Notification; and will be required to prepare and submit to the employer and compliance report stipulated in the permission under the Notification.

26. The Motor Vehicle Act 1988 as amended (and State Motor Vehicle Acts as may be in force) and the Motor Vehicle Rules, 1989, and as amended (and State Motor Vehicle Rules as may be in force): To minimize the road accidents, penalizing the guilty, provision of compensation to victim and family and check vehicular air and noise pollution. Contractors will be required to ensure full compliance to these rules.

27. Easement Act, 1882: This provides for the rights of landowners on groundwater. Contractors will need to ensure that other landowners' rights under the Act is not affected by any groundwater abstraction by the contractors.

28. State Groundwater Acts and Rules as may be in force and the Guidelines for Groundwater Abstraction for drinking and domestic purposes in Notified Areas and Industry/Infrastructure project proposals in Non-Notified areas, 2012: These provide for regulating extraction of ground water for construction/industrial and drinking and domestic purposes. Contractors will need to obtain permission from Central/State Groundwater Boards prior to groundwater abstraction through digging any bore well or through any other means; and will to ensure full compliance to these rules and any conditions imposed in the permit.

29. The Mines Act, 1952 as amended; the Minor Mineral and concession Rules as amended; and the State Mineral (Rights and Taxation) Acts as may be in force: These provide for for safe and sound mining activity. The contractors will procure aggregates and other building materials from quarries and borrow areas approved under such Acts. In the event the contractors open any new quarry and/or borrow areas, appropriate prior permission from the State Departments of Minerals and Geology will need to be obtained. Contractors will also need to ensure full compliance to these rules and any conditions imposed in the permit.

30. The Insecticides Act, 1968 and Insecticides Rules, 1971 and as amended: These provide for regulates the manufacture, sale, transport, distribution, export, import and use of pesticides to prevent risk to human beings or animals, and for matters connected therewith. No one should import or manufacture; sell, stock or exhibit foe sale; distribute, transport, use: (i) any

misbranded insecticides, (ii) any insecticide the sale, distribution or use of which is for the time being prohibited under the Act; and (iii) any insecticide except in accordance with the condition on which it was registered under the Act.

31. National Building Codes of India, 2005 and as amended: This provides guidelines for regulating the building construction activities in India. The code mainly contains administrative regulations, development control rules and general building requirements; stipulations regarding materials, structural design and construction; and building and plumbing services. Contractors will be required to comply with all Bureau of Indian Standards Codes dealing with: (i) use and disposal of asbestos containing materials in construction; (ii) paints containing lead; (iii) permanent and temporary ventilations in workplace; (iv) safety, and hygiene at the workplace; (v) prevention of fire; (vi) prevention of accidents from faulty electrical gadgets, equipment and accessories; and all other such codes incidental to the Contract.

Appendix - 2
Appointment of Adjudicator

Suggested Draft of **Letter of Appointment of Adjudicators** in civil works contracts

Sub:_____(Name of the Contract)

To

Name and address of the Adjudicator

We hereby confirm your appointment as Adjudicator for the above contract to carry out the assignment specified in this Letter of Appointment.

For administrative purpose_____(*name of the officer representing the Employer*) has been assigned to administer the assignment and to provide the Adjudicator with all relevant information needed to carry out the assignment on behalf of both the employer and the contractor. The services will be required during the period of contract for the work of (Name of the Contract)_____.

The Adjudicator shall visit the worksite once in 3 (three)months till the completion of the work indicated above or as specifically requested by Employer/ Contractor for the period upto the end of defects liability period with prior intimation to the Employer and the contractor. The duration of each visit shall ordinarily be for one day only. These durations are approximate and (*Name of the employer and Name of the Contractor*) may find it necessary to postpone or cancel the assignment and/or shorten or extend the duration.

The appointment will become effective upon confirmation of letter by you. The appointment of Adjudicator shall be liable for termination under a 30 (thirty) days written notice from the date of issue of the notice, if both Employer and the Contractor so desire. Also the appointment shall automatically stand terminated 14 days after the defect notice / correction period as stated in Clauses 23 and 24 of the Conditions of Contract is over.

The Adjudicator will be paid a fee of Rs._____ (Rupees _____only) per each day of visit at the worksite. The actual expenses for boarding and traveling in connection with the assignment will be reimbursed to the Adjudicator. The Adjudicator will submit a pre-receipted bill in triplicate to the employer indicating the date of the visit, fees for the visit and a proof in support of the actual expenditure [only for items valued above Rs. 500 each] incurred by him against boarding, lodging and traveling expenses after performing the visit on each occasion. The Employer will make the admissible payment (both the Employer's and the Contractor's share) to the Adjudicator within 30 days of the receipt of the bill. The Contractor's share on this account (half the paid amount) will be recovered by the Employer from the Contractor's bills against the work.

In accepting this assignment, the Adjudicator should understand and agree that he is responsible for any liabilities and costs arising out of risks associated with travel to and from the place of emergency repatriation, loss or damage to personal/professional effects and property. The Adjudicator is advised to effect personal insurance cover in respect of such risks if he does not already have such cover in place. In this regard, the Adjudicator shall maintain appropriate medical, travel, accident and third-party liability insurance. The obligation under this paragraph will survive till termination of this appointment.

Procedures for resolution of disputes by the Adjudicator is described in the contract of _____(name of the contract) between the employer and the contractor vide Clause No.24 of the General Conditions of Contract. Your recommendation should be given in the format attached, within 28 days of receipt of a notification of dispute.

The Adjudicator will carry out the assignment in accordance with the highest standard of professional and ethical competence and integrity, having due regard to the nature and purpose of the assignment, and will conduct himself in a manner consistent herewith. After visiting the worksite, the Adjudicator will discuss the matter with the Employer and if necessary with the Contractor before arriving at any decision.

The Adjudicator will agree that all knowledge and information not within the public domain, which may be acquired while carrying out this service shall be all time and for all purpose, regarded as strictly confidential and held in confidence, and shall not be directly or indirectly disclosed to any party whatsoever, except with the permission of the employer and the contractor. The Adjudicator's decision should be communicated in the form of a speaking order specifying the reasons.

The Adjudicator will agree that any manufacturing or construction firm with which he might be associated with, will not be eligible to participate in bidding for any goods or works resulting from or associated with the project of which this consulting assignment forms a part

Read and Agreed Name of Adjudicator

Signature

Place:

Date:

Name of Employer
Signature of authorized representative of Employer

Name of the Contractor
Signature of authorized representative of Contractor

Attachment: Copy of contract document between the employer and contractor and format for recommendation.

SUMMARY OF AJUDICATOR'S RESPONSIBILITIES

The Adjudicator has the following principal responsibilities:

1. Visit the site periodically.

2. Keep abreast of job activities and developments.

3. Encourage the resolution of disputes by the parties.

4. When a dispute is referred to it, conduct a hearing (no legal presentation), complete its deliberations, and prepare a recommendations in a professional and timely manner (as per sample format)

Sample Format of Adjudicator's Recommendation

[Project Name]
Recommendation of Adjudicator

Dispute No. XX [*NAME OF DISPUTE*]

Hearing Date:_____

Dispute

Description of dispute. A one or two sentence summation of the dispute.

Contractor's Position

A short summation of the contractor's position as understood by the Adjudicator.

Employer's Position

A short summation of the Employer's position as understood by the Adjudicator.

Recommendation

The Adjudicator's specific recommendation for settlement of the dispute. (*The recommended course is consistent with the explanation*).

Explanation

(*This section could also be called Considerations, Rationale, Findings, Discussion, and so on.*)

The Adjudicator's description of how each recommendation was reached.

Respectfully submitted,

Date : _____ _____

Date : _____ _____

Date : _____ _____

Section X - Contract Forms

This Section contains forms which, once completed, will form part of the Contract. The forms for Performance Security, ES performance security if applicable, and Advance Payment Security, when required, shall only be completed by the successful Bidder after contract award.

NOTIFICATION OF AWARD

Letter of Acceptance

[on letterhead paper of the Employer***]***

[The Letter of Acceptance shall be the basis for formation of the Contract as described in ITB Clause 47. This Standard Form of Letter of Acceptance shall be filled in and sent to the successful Bidder only after evaluation of bids has been completed, subject to any review by the World Bank required under the Loan Agreement.]

. . . . . ***[date]***. . . . . .

To: . . . . . ***[name and address of the Contractor]*** . . . . . .

Subject: . . . . . ***[Notification of Award Contract No]***. . . . . .

This is to notify you that your Bid dated . . . . ***[insert date] . . .*** . for execution of the . . . . . ***.[insert name of the contract and identification number, as given in the PCC]***. . . . . for the Accepted Contract Amount of . . . . . ***.[insertamount in numbers and words]***, as corrected and modified[22] in accordance with the Instructions to Bidders is hereby accepted by our Agency.

You are requested to furnish the Performance Security, plus additional security for unbalanced bids in terms of ITB Clause 41, and ES Performance Security***[Delete ES Performance Security if it is not required under the contract]*** in the form detailed in ITB Clause 50 for amounts[23] of Rs. …….., and Rs. ……. specified therein, within 21 days of the receipt of this letter of acceptance, and visit this office to sign the contract, failing which action as stated in ITB Clause 50.2 will be taken in accordance with the Conditions of Contract. The securities shall be valid upto 28 days from the date of completion i.e. upto ……. and shall be as per the Performance Security Form and the ES Performance Security Form***[Delete reference to the ES Performance Security Form if it is not required under the contract]***,included in Section X -Contract Forms, of the bidding document.

[Choose one of the following statements:]

We accept that _____***[insert the name of Adjudicator proposed by the Bidder]*** be appointed as the Adjudicator[24].

[or]

We do not accept that _____***[insert the name of the Adjudicator proposed by the Bidder]*** be appointed as the Adjudicator, and by sending a copy of this Letter of Acceptance to _____***[insert name of the Appointing Authority]***, the

[22]*Delete "corrected and" or "and modified" if not applicable. See Notes on Standard Form of Agreement, next page.*

[23]*Insert amounts for (i) Performance Security, plus additional security for unbalanced bids in terms of ITB Clause 41; and (ii) ES Performance Security respectively.*

[24]*To be used only if the Contractor disagrees in the Bid with the Adjudicator proposed by the Employer in the Instructions to Bidders, and has accordingly offered another candidate.*

Appointing Authority, we are hereby requesting such Authority to appoint the Adjudicator in accordance with ITB 51.1 and GCC 23.1[25].

We note that as per your bid, you do not intend to subcontract any component of work.

[OR]

We note that as per your bid, you propose to employ M/s. …… as sub-contractor for executing ……..

We have reviewed the construction methodology submitted by you alongwith the bid in response to ITB Clause 16 and our comments are given in the attachment. You are requested to submit a revised Program including ES requirements as per Clause 30 of General Conditions of Contract within 14 days of receipt of this letter of acceptance.

Authorized Signature: .....

Name and Title of Signatory: .....

Name of Agency: .....

[25]*To be used only if the Contractor disagrees in the Bid with the Adjudicator proposed by the Employer in the ITB, has accordingly offered another candidate, and the Employer does not accept the counterproposal.*

Issue of Notice to proceed with the work

(letterhead of the Employer)

_____ (*date*)

To

_____(*name and address of the Contractor)*

_____

_____

Dear Sirs:

Pursuant to your furnishing the requisite securities as stipulated in ITB clause 50.1, insurance policy as per GCC 13, construction methodology as stated in letter of acceptance and signing of the contract agreement for the construction of_____@ a Bid Price of Rs._____, you are hereby instructed to proceed with the execution of the said works in accordance with the contract documents.

Yours faithfully,

(Signature, name and title of signatory authorized to sign on behalf of Employer)

Attachment: Contract Agreement

Contract Agreement

THIS AGREEMENT made the . . . . . .day of . . . . . ., ..., between . . . . . ***[name of the*** Employer***]***. . . . . (hereinafter "the Employer"), of the one part, and . . . . . ***[name of the Contractor]***. . . . .(hereinafter "the Contractor"), of the other part:

WHEREAS the Employer desires that the Works known as . . . . . ***[name of the Contract]***. . . . .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.

(i) This Agreement

(ii) the Letter of Acceptance

(iii) the Contractor's Bid including completed schedules and priced bill of quantities,

(iv) the addenda Nos _____(if any)

(v) the Particular Conditions

(vi) the General Conditions of Contract, including appendix;

(vii) the Specification

(viii) the Drawings

(ix) Construction Program, Methodology, Quality Assurance Program, the ES Management Strategies and Implementation Plans, and Code of Conductfor Contractor's Personnel (ES)

(x) Joint Venture Agreement [for JVs only];and

(xi) any other document **listed in the PCC** as forming part of the Contract.

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 Indiaon the day, month and year specified above.

Signed by: .....
for and on behalf of the Employer

in the presence of: .....
Witness, Name, Signature, Address, Date

Signed by: .....
for and on behalf the Contractor

in the presence of: .....
Witness, Name, Signature, Address, Date

Performance Security- Bank Guarantee

[including Additional Performance Security for unbalanced bids]

[Guarantor letterhead or SWIFT identifier code]

Performance Guarantee No……. *[insert guarantee reference number]*
Date……. *[insert date of issue of the guarantee]*

To: _____ *[name of Employer]*

_____ *[address of Employer]*

WHEREAS _____ *[name and address of Contractor[26]]* (hereinafter called "the Applicant") has undertaken, in pursuance of Contract No. _____ dated _____ to execute _____ *[name of Contract and brief description of Works]* (hereinafter called "the Contract");

AND WHEREAS it has been stipulated by you in the said Contract that the Applicant shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Applicant such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Applicant, up to a total of _____ *[amount of guarantee[27]]* _____ *[in words]*, such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of _____ *[amount of guarantee]* as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Applicant before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed thereunder or of any of the Contract documents which may be made between you and the Applicant shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

[26] *In the case of a JV, insert the name of the Joint Venture*

[27] *An amount shall be inserted by the Guarantor, representing the percentage of the Contract Price specified in the Contract less provisional sums, if any, plus additional performance security for unbalanced bids if any, and denominated in Indian Rupees.*

This guarantee shall be valid until …… [28], and any demand for payment under it must be received by us at this office on or before that date.

Signature and seal of the guarantor _____

Name of Bank _____

Address _____

Date _____

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

[28] *Insert the date twenty-eight days after the expected completion dateas described in GC Clause 53.1. 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 Employer'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
ES – Bank Guarantee

[Guarantor letterhead or SWIFT identifier code]

ES Performance Guarantee No.: *[Insert guarantee reference number]*

Date……. *[insert date of issue of the guarantee]*

To: _____ *[name of Employer]*

_____ *[address of Employer]*

WHEREAS _____ *[name and address of Contractor[29]]* (hereinafter called "the Applicant") has undertaken, in pursuance of Contract No. _____ dated _____ to execute _____ *[name of Contract and brief description of Works]* (hereinafter called "the Contract");

AND WHEREAS it has been stipulated by you in the said Contract that the Applicant shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his Environmental and/or Social (ES) obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Applicant such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Applicant, up to a total of _____ *[amount of guarantee[30]]* _____ *[in words]*, such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of _____ *[amount of guarantee]* as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Applicant before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed thereunder or of any of the Contract documents which may be made between you and the Applicant shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

[29] *In the case of a JV, insert the name of the Joint Venture*

[30] *An amount shall be inserted by the Guarantor, representing the percentage of the Contract Price specified in the Contract less provisional sums, if any, and denominated in Indian Rupees.*

This guarantee shall be valid until …… [31], and any demand for payment under it must be received by us at this office on or before that date.

Signature and seal of the guarantor _____

Name of Bank _____

Address _____

Date _____

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

[31] *Insert the date twenty-eight days after the expected completion dateas described in GC Clause 53.1. 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 Employer's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee*

Advance Payment Security

Demand Guarantee

[Guarantor letterhead or SWIFT identifier code]

Advance Payment Guarantee No……. *[insert guarantee reference number]*
Date……. *[insert date of issue of the guarantee]*

To: _____ *[name of Employer]*

_____ *[address of Employer]*

_____ *[name of Contract]*

Gentlemen:

In accordance with the provisions of the Conditions of Contract, Subclause 53.1 ("Advance Payment") of the above-mentioned Contract, _____ *[name and address of Contractor[32]]* (hereinafter called "the Applicant") shall deposit with _____ *[name of Employer]* a bank guarantee to guarantee his proper and faithful performance under the said Clause of the Contract in an amount of _____ *[amount of guarantee[33]]* _____ *[in words]*.

We, the _____ *[bank or financial institution]*, as instructed by the Applicant, agree unconditionally and irrevocably to guarantee as primary obligator and not as Surety merely, the payment to _____ *[name of Employer]* on his first demand without whatsoever right of objection on our part and without his first claim to the Applicant, in the amount not exceeding _____ [amount of guarantee] _____ *[in words]*.

We further agree that no change or addition to or other modification of the terms of the Contract or of Works to be performed thereunder or of any of the Contract documents which may be made between _____ *[name of Employer]* and the Applicant, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall remain valid and in full effect from the date of the advance payment under the Contract until _____ *[name of Employer]* receives full repayment of the same amount from the Applicant. Consequently any demand for payment under this guarantee must be received by us at this office on or before that date.

Yours truly,

[32]In the case of a JV, insert the name of the Joint Venture
[33]An amount shall be inserted by the bank representing the amount of the Advance Payment, and denominated in Indian Rupees.

Signature and seal: _____

Name of Bank: _____

Address: _____

Date: _____

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

Retention Money Security

Demand Guarantee

[Guarantor letterhead or SWIFT identifier code]

_____ *[Bank's name and address of issuing branch or office]*

Beneficiary: _____ *[Name and Address of Employer]*

***Date:* _____**

RETENTION MONEY GUARANTEE NO.: _____

We have been informed that _____ *[name of contractor[34]]* (hereinafter called "the Applicant") has entered into Contract No. _____ *[reference number of the contract]* dated _____ with you, for the execution of _____ *[name of contract and brief description of Works]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, when the Taking-Over Certificate has been issued for the Works and the first half of the Retention Money has been certified for payment, payment of _____ *[insert* the second half of the Retention Money*]* is to be made against a Retention Money guarantee.

At the request of the Applicant, we _____ *[name of Bank]* hereby irrevocably undertake to pay you the sum or sums not exceeding in total an amount of _____ *[amount in Rupees]* (_____) *[amount in words[35]]* upon receipt by us of your first demand in writing accompanied by a written statement stating that the Applicant is in breach of its obligation under the Contract without cavil or argument.

It is a condition for any claim and payment under this guarantee to be made that the payment of the second half of the Retention Money referred to above must have been received by the Applicant on its account number _____ at _____ *[name and address of Bank].*

This guarantee shall expire, at the latest, 21 days after the date when the Employer has received a copy of the Defects Liability Certificate issued by the Project Manager. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

[34] *In the case of a JV, insert the name of the Joint Venture*

[35] *The Guarantor shall insert an amount representing the amount of the second half of the Retention Moneyor 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.*

_____

[Signature(s) and seal of the guarantor]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

Annexure ESMP

Standard Environmental and Social Management Plan

(ESMP)

STANDARD ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

IMPORTANT NOTE

This Standard ESMP is prepared with management plans for all relevant ESSs.

This Standard ESMP shall be updated with sub-project specific data/ ESIA outcomes/management plans as identified in ESIA for preparing sub-project specific ESMP, as applicable.

CHAPTER 1: PROJECT OVERVIEW

1.1. Proposed Project (Phase 1) Development Objective(s)

The proposed Project Development Objective (PDO) is to "strengthen institutional capacity to improve integrated water resources planning and management and to build resilience to flood and erosion risks in Assam."

1.2. Key Results of the Project

The proposed project seeks to achieve the following key results towards achieving the PDO:

- Modernized institutions for water resources planning and management and disaster risk reduction in Assam (index)
- Targeted basin/sub-basin investment plans completed with analytical and stakeholder input (number)
- Population in targeted area with reduced risk from flooding or erosion (number)

1.3. Project Components

The four components of the project include:

Component 1: Institutional Strengthening

The aim of this component is to modernize and strengthen the capacity of the key agencies, including WRD, FREMAA, and ASDMA. This will include equipping WRD, ASDMA, and other related institutions in Assam with modern tools and systems for planning and design of programs and their implementation. To assess the needs, it was agreed that the World Bank would provide technical assistance to carry out a functional review of GoA agencies working in water resources and disaster risk management. The component will support institutional cooperation at local, regional and international levels (such as knowledge exchange programs, internships, exposure visits, etc.) and improved coordination with various departments in Assam and beyond that deal with water resources management and disaster risk mitigation. Stakeholder engagement, including setting up two-way communication channels, will also be supported under this component.

Component 2: Integrated River Basin Planning and Demonstration Investments.

The aim of this component is to develop an integrated water resources planning framework for cross-sectoral investment. This will include the development of a suite of analytical tools for planning and operational decision support systems, in addition to targeted technical studies to fill critical knowledge gaps and serve as a sound basis for integrated basin planning. It was agreed that traditional approaches that rely almost exclusively on hard infrastructure investments (such as embankments) and that have had only limited success, and some striking failures, in managing the complex river systems should give way to more integrated and adaptive approaches that focus on nature-based 'green' infrastructure and non-structural measures. The aim is to mainstream nature-based and environmental management measures into decision-making based on sound economic principles. Instrumentation and monitoring will also be supported under this component.

Initially small number of demonstration investments in selected tributaries of the Brahmaputra Basin (Buridehing River, Manas River and Beki River) under this component was identified.

Component 3: Flood and Erosion Management.

The aim of this component is to begin to address two major water-related risks in Assam, i.e., recurrent floods and extensive erosion. The following specific activities were discussed and will be confirmed in the course of project preparation: (i) enhancement of operational lead flood forecasting and early warning systems for short-term forecasts of water levels and flooding, including impact forecasting and development of community alert systems; (ii) flood hazard mapping and flood plain zoning; (iii) embankment design and management systems; (iv) erosion management systems, including monitoring of impacted areas, erosion prediction modeling, erosion mitigation plans, etc.; (v) scaling up community-based disaster risk mitigation (CBDRM) and ASDMA's program on climate resilient villages including multipurpose flood shelters, community-level emergency response teams, and community flood disaster education and preparedness planning; (vi) studies on the impact of livelihoods due to erosion and flooding and mitigation plans; and (vii) establishing a state-of-the art flood forecasting and mathematical modeling center, drawing on the experience of other countries and States such as Bihar. GoA to engage with various government agencies outside of Assam, including the North East Space Application Center (NESAC), Indian Meteorological Department (IMD), and the Central Water Commission (CWC) to support flood forecasting and other activities under the project.

Component 4 – Contingency Emergency Response Component (CERC)

This component will allow provision of immediate response to an Eligible Crisis or Emergency, as needed, following an adverse natural event that causes a major natural disaster. GoA may request the Bank to re-allocate project funds to support response and reconstruction.

1.4. OBJECTIVE AND CONTEXT OF ESMP

This Standard ESMP is prepared to describe the process to manage the impacts identified during the Environmental & Social Screening & Scoping (ESSS). It should be noted that this Standard ESMP is prepared with management plans for all relevant Environmental and Social Standards (ESSs). This Standard ESMP shall be updated with sub-project specific data management plans as identified in ESIA for preparing sub-project specific ESMP, as applicable."

This ESMP is a live document and is subjected to periodic review and updates. WRD and contractors are primarily responsible for the implementation of the ESMP. Environmental and social management plans covering various phases, prepared as part of this ESMP shall be updated in line with the dynamics of project progress and stakeholder engagement inputs. If during the operationalization of this ESMP, new conditions emerge and risks and impacts differ from that identified in the Environmental & Social Screening & Scoping, a new ESMP may be prepared adapting to the new conditions.

1.5. E & S SCREENING & SCOPING FINDINGS AND KEY IMPACTS TO BE ADDRESSED

(i) This section should also be customized for each sub-project in line with ESIA findings.

ESIA has been carried out considering the proposals/interventions mentioned in the DPR. The screening and site assessment exercise has identified the nature of risk and impacts, with level

of risk and the outcomes are documented in ESIA report. The risks/impacts identified are related to labour employment and working conditions, pollution generation from rehabilitation work and impact on physical environment, SEA/SEAH and GBV risks. These risks are moderate and localised, short term and temporary in nature which can be managed following management plans and guidelines.

Environment risks of air, water, noise, land use, soil and resource use for most of the activities are substantial as well as social risks of labour. Environment risks of pollution downstream and upstream is categorised as substantial for some of the activities along with that of labour camp. As per ESMF, Occupational Health and Safety (OHS) risk is envisaged across the project interventions, a separate OHS plan in accordance with WBG Environmental Health and Safety (ESHS) Guidelines and Good Practice shall be applicable to all sub-projects. Hence it was not being considered under screening criteria. Occupational health and safety is considered an important requirement and shall be managed as per OHS plan and will be part of Contractor's ESMP. Based on E&S findings, WB Environmental & Social Standards (ESS) applicability analysis and recommended management plan is given at Table 1.1.

Table 1.1 WB-ESS Applicability Analysis and Recommended management plan

WB-ESS	Recommended Management Plan	Applicability To proposed 6 sub-projects
ESS1: Assessment and Management of Environmental and Social Risks and Impacts	Gender Based Violence or SEA/SH related actions	Applicable
ESS2: Labour and Working Conditions	Labour Management Procedure including Occupational health and Safety	Applicable
ESS3: Resource Efficiency, Pollution Prevention and Management	Pollution Prevention and Environment Quality Management Plan including Debris Management	Applicable
ESS 4: Community Health and Safety	Community Health and Safety Plan	Applicable
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Resettlement Action Plan/ Livelihood improvement Plan	Not Applicable
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural resources	Biodiversity Conservation Plan	Applicable
ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Tribal Development Plan	Not Applicable
ESS 8: Cultural Heritage	Cultural Heritage Protection Plan	Not Applicable
ESS 10: Stakeholder Engagement Plan	Stakeholder Engagement Plan	Applicable

(ii) *Applicability of WB-E&S standards will be assessed for each sub-project during ESIA; the above table is for priority selected locations under Buridehing River Basin.

The above recommended plans are discussed in detail in Chapter 2.

CHAPTER 2: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLANS

The E&S management plans prepared for the risks and impacts identified as part of ESIA are presented hereunder. Each plan includes mitigation measures specific to the risks and impacts and where applicable, sets out the framework for other plans and procedures to be developed later in the Project. Construction contractors will develop and implement their own site specific C-ESMPs.

2.1 GENDER BASED VIOLENCE OR SEA/SH RELATED ACTIONS (ESS1)

The following key actions are to be ensured during implementation:

S. No.	Key Action to address GBV/SEA/SH Risks	By Whom
1	Clearly define SEA/SH requirements in Bid-documents and also the requirement for a CoC which addresses SEA/SH, using Standard WB procurement documents	FREMAA
2	Operationalize or constitute Internal Complaints Committee as per Prevention of Sexual Harassment at Workplace procedure	FREMAA
3	Implement appropriate project-level activities such as: separate, safe and easily accessible facilities for women and men in the place of work and the labour camps. (e.g. toilets should be located in separate areas, well-lit) display signs that the project site is an area where SEA/SH is prohibited.	Implementation by Contractor / GBV Focal Point at FREMAA & overall supervision by GRM Cell
4	Ensure Codes of Conduct are clearly understood and signed by those with a physical presence at the project site; Train project staff on the behaviour obligations under the CoCs and Disseminate CoCs (including visual illustrations) and discuss with employees and local communities.	FREMAA/ Site In-Charge (WRD) Contractor
5	Undertake regular M&E of progress on SEA/SH prevention and response activities, including reassessment of risks as appropriate.	GBV Focal Point at FREMAA

Implementation costs would include: preparation of sign boards, posters, conducting of awareness trainings by Contractor based on recommendation/ approval from FREMAA.

2.2 LABOR MANAGEMENT PROCEDURE (ESS2)

2.2.1 OVERVIEW OF LABOR USE IN THE PROJECT

Number of Project Workers: Approximately 30-40 workers at different points of time (Direct workers, Contracted workers and Community workers) shall be engaged for the flood & river erosion management work.

Characteristics of Project Workers: As per the proposed execution strategies for all sub-projects, the following categories of project workers are identified:

iv) Direct workers – all the existing sub-project site officials including those from FREMAA & WRD involved in the project activities;

v) Contracted workers - FREMAA would engage Contractors to undertake rehabilitation works; agencies/firms to support core service functions. These contractors shall bring skilled Migrant workers for some of more specialized tasks; and

vi) Community workers (or volunteers particularly for EAP).

Timing of Labor requirements: See Table below:

S.No.	Type	Numbers	Locations	Duration	Skills required
1	Direct Workers (Project officials)		Sub-project site	Throughout	Executive and Supervisory
2	Contracted Workers		Sub-project site	24 months	Varied (skilled, semi-skilled)
3	Community Workers		Villages/areas in the vicinity of the sub-projects	Only during EAP implementation	Community facilitation skills

Hence as per WB's guidance note, for such workers, Contractor needs to prepare detailed profile of Workforce as per table below:

Key work activities	Schedule for such activities	Duration of contract	Rotation	Place of residence		
				workers from community	Within local community	On site

2.2.2 ASSESSMENT OF KEY POTENTIAL RISKS

Labour related risks would include:

- Safety issues while at work like injuries/accidents/ fatalities, Occupational health and safety risks due to exposure of workers to unsafe conditions while working at heights, working using lifts, handling of equipment and machinery, exposure to air and noise pollution etc. will be addressed through OHS guidelines.
- Short terms effects due to exposure to dust and noise levels, while at work
- Inadequate accommodation facilities for labour, including inadequate sanitation and health facilities
- Discrimination in Employment (e.g. abrupt termination of the employment, working conditions, wages or benefits etc.)
- Sexual harassment at work

- Absence or inadequate or inaccessible emergency response system for rescue of labour/workforce in situations of natural calamities.
- Health risks of labour relating to HIV/AIDS and other sexually transmitted diseases
- Non-payment of wages
- Unclear terms and conditions of employment
- Discrimination and denial of equal opportunity in hiring and promotions/incentives/training opportunities
- Denial for workers' rights to form worker's organizations, etc.
- Absence of a grievance mechanism for labour to seek redressal of their grievances/issues

2.2.3 RESPONSIBLE STAFF

See Table below for list of key activities with responsibilities:

S. No.	Activity	Responsibility
1	Engagement and management of Contractors	WRD/ FREMAA
2	Engagement and management of Sub-Contractors	Contractor
3	Occupational Health and Safety (OHS)	Engineer-In-Charge (FREMAA/WRD)
4	Training of Workers	Engineer-In-Charge (FREMAA/ WRD)
5	Addressing worker grievances	Contractor (with supervision of WRD/FREMAA)

2.2.4 POLICIES AND PROCEDURES

These are listed below under the following sub-headings: i) Incidents and Accident Notification; ii) GBV/SEAH related iii) Occupational Health and Safety; and iv) COVID considerations.

i) **Incidents and Accident Notifications:** The contractor will promptly notify to the FREMAA within 8 hours any major incident or accident having significant impact on the environment, tangible cultural heritage, communities, the public or workers. They will provide sufficient detail regarding the incident or accident, indicating immediate measures taken to address it, and including information provided by any contractor and supervising entity. Further the FREMAA will appraise this to WB.

ii) **GBV/SEAH related:** More than 95% of the contract labor is expected to be men, and women's participation as contract labor or community labor is going to be very low. Contractors will need to maintain harmonious relations with local communities by ensuring laborers/workers adhere to Code of conduct (CoC). The CoC commits all persons engaged by the contractor, including sub-contractors and suppliers, to acceptable standards of behavior. The CoC will include sanctions for non-compliance, including non-compliance with specific policies related to gender-based violence, sexual exploitation and sexual harassment (e.g., termination). The CoC will be written in plain language and signed by each worker to indicate that they have:

- received a copy of the CoC as part of their contract;
- been explained the CoC to them as part of induction process;
- acknowledged that adherence to this CoC is a mandatory condition of employment;
- understood that violations of the CoC can result in serious consequences, up to and including dismissal, or referral to legal authorities.

To mitigate potential risks related to on-site safety and GBV, the Contractor/ will undertake actions as given in Table below:

S. No.	Action	Timelines
1	Separate, safe and easily accessible facilities for women and men in the place of work and the labour camps. (e.g. toilets should be located in separate areas, well-lit)	Throughout construction period
2	Display signs that the project site is an area where SEA/SH is prohibited.	Throughout construction period
3	Ensure Codes of Conduct are clearly understood and signed by those with a physical presence at the project site;	Upon joining
4	Train project staff on the behavior obligations under the CoCs and Disseminate CoCs (including visual illustrations) and discuss with employees and local communities.	Periodic; every six months

iii) Occupational Health and Safety:

WRD & FREMAA is committed to:

- Complying with legislation and other applicable requirements which relate to the occupational health and safety hazards.
- Enabling active participation in OH&S risks elimination through promotion of appropriate skills, knowledge and attitudes towards hazards.
- Continually improving the OH&S management system and performance.
- Communicating this policy statement to all persons working under the control. of FREMAA with emphasis on individual OH&S responsibilities.
- Availing this policy statement to all interested parties.

To avoid work related accidents and injuries, the contractor shall ensure following Do's and Don'ts at site will:

- ***Health Check-up***: Ensure that health of each worker is checked and health record is maintained before deputing them to work.
- ***Deployment of EHS officer :*** Designate a person responsible for OHS who is fully acquainted with handling of OHS issues
- ***Induction training***: Ensure that every workers is given OHS orientation training which will include use of PPE, first aid, use of fire extinguishers, action to be taken in case of accidents, caution to be exercised during working at height or confined areas, respecting system and procedures evolved at site for safe working. Training shall create enough awareness amongst workers so that they take reasonable care to avoid acts or omissions that are likely to result in injury to self, or the other workers/and other people.
- ***First Aid***: Ensure that first aid box is provided at each workplace with easily identifiable location. Few workers shall be trained as first aider.
- ***PPE***: Ensure availability of PPE. helmet, boot, earplug (for noisy areas) , mask for dusty areas, gloves, safety belt and safety jacket.

- ***SOPs:*** Define SOPs (standard operating procedures) for Working at height or confined areas which will include minimum two persons working, one at work and another standby as rescuer.
- ***Ventilation***: Maintain adequate ventilation at confined areas and at workplace.
- ***Illumination***: Maintain adequate illumination at all workplaces.
- ***Electric Hazards***: Prevent exposure to electrical hazards.
- ***Fire Protection***: Ensure adequate fire extinguisher (as per type of fire hazard viz A, B, C)
  are placed at workplace.
- ***Dust Control:*** Ensure that workers are not exposed to high dust and noise level which can affect their health. Use dust suppressing system like water sprinkling and muffler or acoustic enclosures for noise generating system.
- ***Gas Cylinder handling***: Acetylene and oxygen/gas cylinders shall be handled using trolley where these cylinder are securely separated with each other for its safe use.
- ***Drinking Water and Sanitation***: Ensure that safe drinking water is available at each work site. Also mobile toilets fitted with anaerobic sewage treatment system are provided at each work site.
- ***Barricading and securing the work areas***: Each hazardous work area, if any, have safety barricading depending on nature of hazard viz trip, fall danger, restricted entry area, electrical hazard.
- ***Safety Signage and Mock Drill***: Place adequate safety caution and signage in local languages for awareness to workers. Also conduct periodic mock drill.
- ***Back-up Medical facility***: identify and tie up with equipped hospital capable of providing ambulance and medical facilities or handling major injuries.
- ***Accident*** Reporting ***Analysis and Prevention***: Identify the reportable accidents[36], analyse the cause of each reportable accident, maintain the record with analysis and take corrective action based on cause analysis for prevention of such accidents in future.
- ***Caution from Covid-19 scenario***: Provide multiple entries for workers to avoid crowding depending upon site condition. Ensure that physical distancing is maintained as far as possible at workplace. Each workers shall be provided with face mask.
- ***Compliance to law***: Ensure those legal requirements are followed like restriction on use of Child labour etc.

DON'T

- Do anything which may leads to risk to established health, safety and well being rules or relevant health, safety and well being regulatory requirements.

[36] An accident which causes death or which causes any bodily injury by reason of which the person injured is prevented from working for a period of forty-eight hours or more immediately following the accident (as per Building and Other Construction Workers Act, 1996)

- Jeopardise mental and physical well being or that of people you work with by, for example, imposing unreasonable deadlines or regularly demanding longer working hours.

Further to enforce the compliance of environmental management, contractors will be responsible and liable for safety of site equipment, labours and daily workers attending to the construction site and safety of citizens for each work site, as mandatory measures.

(iii) Occupational Health and Safety Monitoring

OHS compliance monitoring will carried out by designated E&S Expert every month. Contractor will provide compliance in initial report to Engineer in charge and thereafter submit a compliance report every 3 months. Following shall be covered as part of OHS monitoring:

- Health check-up records of workers, as applicable.
- Accident hot spots on transport route, if any
- Training and awareness of labour – OHS, Emergency Management, Use of PPEs
- Identification of hazardous working locations and marking
- Emergency response procedure
- Availability of PPEs – types, numbers
- Accident reporting

(iv) Communication and Consultation (Workers)

Workers consultation will be regular features. However, this aspect shall be as per consultation process defined under other plans and ESS4.

(v) Training and Records

Contractor will provide training to all workers before start of work and thereafter every three months. He will maintain training records and share the details with E&S specialist of the sub-project as part of his quarterly progress report. The training should cover the following:

- General awareness about the site, type of works to be carried out and risks involved
- Use of appropriate PPEs for different types of works including dust masks and ear muffs
- Following work instructions for hazardous/risky operations as marked on site
- How to act during emergency including basic rescue operations and accident reporting
- Location of first aid boxes and fire extinguishers and how to use them
- Handling of gas cylinders

(vi) Emergency Preparedness and Management

Emergency Preparedness and Management Plan shall be followed as given under ESS 4

Reference to World Bank Group –(WBG) Environmental Health and Safety (EHS) and Other Guidelines

The WBG Guidelines of Environmental Health and Safety (WBGEHS) provide detailed guidance note on health and safety requirement and good practices. The WBGEHS guidelines are intended to be used in conjunction with Indian legislation on OHS at construction sites and shall be referred by contractor and IAs while finalizing site specific contractor's EHS management plan.

2.2.5 AGE OF EMPLOYMENT

The minimum age of employment for this project shall be 18 years and to ensure compliance, all employees will be required to produce Aadhar card or any other valid proof of age. If any contractor employs a person under the age of 18 years, that contractor will not only be terminated by WRD/FREMAA but also be reported to the authorities.

2.2.6 TERMS AND CONDITIONS

Terms and conditions for three types of workers are presented below:

- The Direct Workers (FREMAA/ WRD officials) are governed by their employment agreements with the Department

- Contractors will also be required to comply with the most current Regulation of Wages for the Building and Construction Industry which is issued by the Government and reviewed on a regular basis. The Minimum Wage Act specifies the minimum wages, hours of work, overtime pay, leave entitlements, travelling and Subsistence Allowances and the issue of protective clothing. Before a contract is awarded, contractor is required to certify in writing that the wages, hour and conditions of work or persons to employed by him on the contract are not less favourable than those contained in the most current wages regulation issued by the Labour Commissioner. Where a contractor fails to comply with this requirement, the contract with the contractor may be withdrawn as an approved contractor upon recommendations of the Labour Commissioner.
- In ensuring full compliance with the law in this regard, contractors will be required to furnish with copies of the labour license and/ or copies of contract of all its workforce. As a monitoring mechanism, a contractor shall not be entitled to any payment unless he has confirmed that all employment conditions of the contract are being complied with. FREMAA would intervene if the contractor defaults in the payment of wages due to any of its employees.
- 'Community Workers' is further detailed in following sections.

2.2.7 GRIEVANCE MECHANISM

The Grievance Mechanism for Workers will be organised as follows.

i. **Direct Workers (Project Officials):** GRM Cell, FREMAA will be responsible for providing guidance and advice on all worker related grievances and their redressal, in line with the state and national legislation and the LMP.

ii. **Contract Workers:** While the Contractor will have his own GRM, PMU (FREMAA/ WRD will have oversight) and the overall responsibility for ensuring the establishment and implementing the GRM for project workers. In this regard, the concerned Engineer from FREMAA/ WRD will be responsible to ensure that the

Contractor has established and operationalized the contract workers grievance redress mechanism. In this, Contractor will be supported by GRM Cell, FREMAA designated for the purpose. GRM Cell will also be responsible for tracking and resolving workers grievances. GRM Cell shall maintain records where grievances and complaints, including minutes of discussions, recommendations and resolutions made, will be recorded.

iii. **Community Workers:** The concerned sub-project in-charge from FREMAA/ WRD, will be responsible for providing guidance and advice on all community worker related grievances with this LMP.

The designated Social Specialist/ Communication Specialist in FREMAA will provide overall implementation and capacity building support on resolving all workers grievances and will support sub-project in-charge in this regard. S/HE will also include workers grievance status in the progress report. Grievances will continue to be received through established communication channels. Workers will also be able to submit their grievances through the district Labour Department, whose contacts will be shared with all the contractors and worksites.

2.2.8 CONTRACTOR MANAGEMENT

FREMAA will ensure that contractor monitor, keep records and report on terms and conditions related to labour management. The contractor must maintain records with evidence of all payments made, including social security benefits, pension contributions or other entitlements, as applicable based on workers engagement i.e.-fixed term contract, full-time, part-time or temporary. The application of this requirement will be proportionate to the activities and to the size of the contract, in a manner acceptable to FREMAA and the World Bank:

Labour conditions: records of workers engaged under the Project, including contracts, registry of induction of workers including CoC, hours worked, remuneration and deductions (including overtime), collective bargaining agreements;

Safety: Reportable incidents and corresponding Root Cause Analysis (lost time incidents, medical treatment cases), first aid cases, high potential near misses, and remedial and preventive activities required (for example, revised job safety analysis, new or different equipment, skills training, and so forth).

Workers: number of workers, indication of origin (local and migrant), gender, age with evidence that no child labour is involved, and skill level (unskilled, skilled, supervisory, professional, management).

Training/induction: dates, number of trainees, and topics.

Details of any security risks: details of risks the contractor may be exposed to while performing its work; the threats may come from third parties external to the project. Worker grievances: details including occurrence date, grievance, and date submitted; actions taken and dates; resolution (if any) and date; and follow-up yet to be taken; grievances listed should include those received since the preceding report and those that were unresolved at the time of that report.

2.2.9 COMMUNITY WORKERS

All OHS related aspects shall be applicable to this category of workers also, if they are engaged.

2.3 RESOURCE EFFICIENCY AND POLLUTION PREVENTION (ESS3)

2.3.1 POLLUTION PREVENTION AND ENVIRONMENT QUALITY MANAGEMENT PLAN (PPEQMP)

Flood & River Erosion work in general can be categorized as civil work earth work at embankment, anti-erosion work, supply of geo-bags, repairing/ reconstruction of slice gate& pro-siltation work requiring labour involvement for works, use of resources such as raw material, water and power during construction, pollution generation from storage and handling of material, generation of waste, use of paints and other chemicals for construction activities and generation of hazardous waste, transportation of raw material, etc. As all the proposed structural interventions are within the sub-project area, no adverse impacts are envisaged on communities including on the disadvantaged or vulnerable people.

Resource Efficiency, Pollution Prevention and Management plan is prepared to address potential risks identified with respect to resource use and pollution generation from civil, construction, repairing work and also from labour camps.

2.3.2 OVERVIEW OF PPEQMP

i. Water Management

The proposed intervention activities are not expected to impact water resources as the proposed interventions are neither crossing, altering or disturbing drainages nor impacting ground water resource in any form. Use of resources such as water and power will be optimized before start of work.

Construction related impacts and risks for water quality include:

- Accidental release of fuel or chemicals and contamination from poor waste management practices can affect surface and groundwater; although quantum of waste is expected to be small.
- Fuel/oil leakage from construction machinery working near water bodies
- Construction work along river bank
- Generation of sanitary wastes from labour colony and construction sites finding way to water bodies

Pollution prevention and control measures to avoid surface water pollution shall include:

- Labour camp will have adequate sanitation arrangement in terms of mobile/fixed toilet with arrangement of sewage collection and disposal. No wastewater from the camp/work force site shall be discharged directly without any treatment in to any surface water channels or drain, which eventually joins surface water bodies.
- The oil/lube storage shall be under roofed areas with impermeable cement concrete surfaces and provided with separate drainage system with oil separators. No discharge from oil/lube storage areas shall be directly discharged in to any open surface water channel/ streams.
- No construction debris and/or spills of construction materials are dumped on to

stream waterway.

- Construction work along river bank shall be done in lean season when surface water level has receded and clear construction area is available.
- Adequate protection needs to be provided to avoid spillage of chemicals/construction material in reservoir.

ii. Air Quality Management

Construction activities can give rise to dust emissions if not effectively managed and have the potential to affect receptors near to the main construction sites due to dust generated from demolition, excavation, operation of construction equipment and machinery, increased movement of vehicles, onto the local road network. Earth works will result in exposed areas of soil which will potentially generate dust when the weather is windy. The level and distribution of dust emissions varies according to the duration and location of activity, weather conditions, and the effectiveness of suppression measures.

Gaseous emission during construction will be from machinery, equipment and vehicles used for material transportation. The operation of vehicles and equipment will result in emissions of carbon monoxide, sulphur dioxide, and oxides of nitrogen. In particular, all commercial vehicle driven with diesel fuel is often used in India. Impact is expected to be localised. Keeping in view the quantum of work and requirement of raw material, only marginal increase in number of vehicles is expected, therefore, emission on village road due to vehicular movement will not be significant.

Pollution prevention and control measures to avoid air pollution shall include:

Among the air pollutants, dust levels in term of $PM_{2.5}$ and PM_{10}, is the most significant. In order to prevent and control the dust levels, the following measures are to be strictly adhered to:

- The contractor/transporter shall carry valid PUC (Pollution Under Control) certificate and only compliant vehicles shall be deployed during construction.
- The vehicles and equipment used during construction should be we well maintained, to ensure minimum emissions. Site in-Charge (WRD/ FREMAA) will carry out physical inspection to ensure compliance.
- The contractor shall provide wind barrier, if required, depending on most prevailing wind direction and presence of sensitive receptors at downwind side, at perimeter of construction site to arrest or blowing of suspended particle.
- Regular sprinkling of the water will be done on construction sites for dust suppression if there is potential of dust emission from storage of handling of loose material.
- If power connection is not available, Mobile DG sets may be used for lighting only during construction phase and they should meet emission and noise standards as per guidelines/standards issued by CPCB/ SPCB. Contractor should obtained license from the ASPCB.
- All the construction workers and other staff, who get directly exposed to dust, should be provided with dusk mask.

iii. Noise and Vibration Control

Sources of noise will be the vehicles and equipment for construction at the project sites. Due to construction activity in the area, noise levels will increase during the period of construction, however, they will remain limited to the work area mainly where construction activity will progress.

Impact of noise generation due to operation of construction machines and equipment is the exposure of workers operating these machines and other who are working in the surrounding. Such impacts can become significant if they are exposed to high noise for long hours continuously.

Pollution prevention and control measures to avoid Noise pollution shall include:

- DG sets, if required, will have a valid Type Approval Certificate and Conformity of Production certificate as per CPCB guidelines.
- All the construction equipment will be required to use available noise suppression devices and properly maintained mufflers.
- Workers in high noise area, will be provided with ear muffs.. Workers exposure (time duration) to high noise will also be controlled.
- Minimize the use of noise producing equipment during night hours to avoid the disturbance to locals and wild animals of surrounding area.
- Vehicles to be equipped with mufflers recommended by the vehicle manufacturer.
- Movement of vehicles on village roads especially heavy vehicles for transportation of construction material, equipment, etc. shall be done during day time only.

iv. Waste Management from repairing/ reconstruction of sluice gate

Project interventions include hydro-mechanical work such as repair/reconstruction of sluice gate. These activities will generate waste in terms of replaced parts, packaging material, empty containers, use and disposal of oil & grease, iron scrap, etc. There will be a mix of hazardous and non-hazardous wastes. It is important to have a plan ready for disposal of such wastes before start of the activity.

Pollution prevention and control measures with respect to waste management: Project engineer needs to identify all the waste generated from hydro-mechanical work including replaced parts with estimated quantities and categorisation as hazardous and non-hazardous waste. Storage and disposal of removed parts need to be planned by site in charge Engineer; separately for hazardous waste which will be given to authorised vendors only.

v. Debris Management

Rehabilitation work will generate construction debris due to repair and demolition works such as removal and fresh laying of rip-raps, removal of top layer during road repairs, operation of construction equipments and machinery and waste generation thereof, etc.

Pollution prevention and control measures in respect of Debris management shall include:

- Debris disposal site shall be identified by contractor and concerned In-Charge Engineer (FREMAA/ WRD) together and necessarily avoid natural water courses.
- While identifying such locations, endeavour would be to find low lying areas nearby so as to avoid effort of transporting debris.
- Area on the course of natural drainage should be avoided.
- The construction debris from all operational areas shall be regularly scavenged and disposed off at identified disposal sites only.
- No dump site shall be located in forest area.
- No dump site shall be located on agricultural area.
- The Contractor shall educate his workforce on issues related to disposal of waste.
- The debris disposal sites have to be suitably rehabilitated by leveling and restoring to original conditions and slopes stabilized.
- If required, grass and local shrubs should be planted to rehabilitate the site.

2.3.3 HOW WATER AND OTHER RESOURCE USE WILL BE PLANNED

Resource planning will be done by contractor in consultation with engineer in charge. After award, the contractor will make an estimate of the raw material requirement, sources for procurement and transportation route. Contractor will discuss the plan with Engineer in Charge at site and get approval.

Material to be procured from quarry/borrow area, shall be identified by contractor along with source. Approval status will be submitted to engineer in charge for consent.

Requirement of water and power at various locations for construction work and labour camp shall be established by contractor and discussed with Engineer in charge. Locations, where DG power is to be used, shall be identified along with location of DG set and its noise and emission impacts on labour and community. Mitigation measures such as ear muffs for labour and sound barrier for community, if required shall be established.

2.3.4 ENVIRONMENTAL QUALITY MONITORING PLAN AND PROTOCOLS

This being flood & river erosion work limited to sub-project area only with localised impacts which can be managed by implementing standard ESMP, environment quality monitoring is not required. However, keeping in view that some of the sub- are located in proximity to protected areas, environmental quality monitoring will be carried out at such subprojects only. These requirements are indicative and can be altered and modified as per project components and activities proposed.

Environment Quality monitoring requirements for sub-project located in proximity to protected areas (where applicability of ESS6 is identified during ESIA) are tabulated below:

Activity	Parameters	Locations	Frequency	Responsibility
Ambient Air Quality	$PM_{2.5}$, PM_{10} and SO_2 for 24 hours	At two major location of rehabilitation works to be identified by E&S Expert	Once before start of construction, once during the construction period and one at end of rehabilitation work	Contractor through NABL accredited Lab
Sound Levels	dB(A) levels – day and night equivalents – hourly reading during day and night time for 24 hrs	At two major location of rehabilitation works to be identified by E&S Expert	Once before start of construction, once during the construction period and one at end of rehabilitation	Contractor through NABL accredited Lab
Wastewater discharge	Physical inspection to ensure wastewater from rehabilitation work is not being disposed off in river	All rehabilitation worksites using water	Once every month	Environmental Specialist, FREMAA
Debris handling and disposal	Physical inspection to ensure debris from rehabilitation work is being securely disposed off at identified and approved location	All rehabilitation worksites generating debris	Once every month	Environmental Specialist, FREMAA
Storage and disposal of hazardous waste	Physical inspection to ensure hazardous waste is being segregated and securely disposed off to authorised vendors	All rehabilitation worksites generating hazardous wastes	Once every month	Engineer in charge

2.3.5 REPORTING

Contractor will prepare a Monthly Progress report (QPR) and submit to EO-NT, FREMAA. The report will cover the compliance status of the Project with the ESMP in their scope and shall include Debris Management, Resource Conservation and Pollution Prevention Plan implementation. EO-NT with support from Environmental & Social Safeguard Specialist at FREMAA will include its own monthly inspection report and submit the report to WB every quarter.

2.4 COMMUNITY HEALTH AND SAFETY (ESS4)

2.4.1 OVERVIEW

Flood & River Erosion work, although limited to sub-project sites, can increase community exposure to risk and impacts. ESS4 addresses the health, safety, and security risks and impacts on project-affected communities and the corresponding responsibility of FREMAA to avoid or minimize such risks and impacts, with particular attention to people who, because of their particular circumstances, may be vulnerable. Occupational health and safety (OHS) requirements for project workers are set out in ESS2, and measures to avoid or minimize impacts on human health and the environment due to existing or potential pollution are set out in ESS3. ESIA has identified that there will not be any direct risks and impacts on communities due to proposed flood & river erosion work including those who are vulnerable. Following sections propose mitigation measures in accordance with mitigation hierarchy to mitigate any indirect impact on communities.

2.4.2 HAZARD IDENTIFICATION

Implementations of sub-project activities pose minimum risk to community health and safety risks as the proposed rehabilitation work will be limited to sub-project area only. However, transportation of material; setting up of labour camp; influx of workers, though small in number and generally skilled workers only; pollution generation from rehabilitation work; may have indirect impact on community as identified in the ESDD report. The risks are summarized below:

Traffic and Road Safety – Sub-project activities are largely structural interventions categorised as civil works and hydro-mechanical works. This would require transportation of construction material, equipment and machinery, instrumentation, parts and accessories to the project sites. In addition, there will be movement of workers (direct and contract workers) to and from site. Transportation of man and material will increase traffic on the village roads during the period of construction leading to increased risk of accidents, spillages, noise and air emissions on generally deserted village roads. Keeping in view the nature of proposed rehabilitation work, only few vehicles will be added per day, therefore this activity do not pose any risk to community. However drivers will be advised to limit the vehicle speed to 30 KM/hr in village areas.

Community Exposure to Health Issues – The sub-project activities will require contract workers – skilled and unskilled. It is expected that unskilled workers will be available locally; however, a small number of skilled workforce will come from outside the area and expected to stay at site. Influx of workers and setting up of temporary labour camp interfacing with community may increase the health risk of community. Migrant workers can be potential carriers of new infectious diseases not known in the area and impact the community health. Labour camp in vicinity of community may pose risk of unplanned waste and waste water discharge.

Management and Safety of Hazardous Material – Sub-project civil, repairing & reconstruction works may require use of hazardous material in limited quantities such as fuels, flammable gases e.g. as acetylene and LPG, etc. Transportation, storage and handling of these hazardous materials shall require careful handling and disposal to minimize risk of public exposure.

2.4.3 HAZARD RISK MANAGEMENT

Following measures are proposed to minimize the community health and safety risks due to sub-project activities:

Traffic and Road Safety

- Transportation of lose construction material will be through covered vehicles only
- PUC for all transport vehicles will made compulsory
- No large scale movement of vehicles at night time
- Drivers will be issued instructions to follow signage and safety norms

Community Exposure to Health Issues

- Health and hygiene requirement of the labour camp will be maintained though out the project cycle – potable water, power, community/individual kitchen, waste management
- Separate toilets for male and female workers staying in labour camp connected to septic tanks/adequate waste collection and disposal arrangement
- Waste management system will be implemented in labour camp by providing adequate number of bins and collection system to avoid littering of waste
- Labour will be sensitized to follow good health and hygiene practices for their as well communities health

Incident Management, OHS monitoring, training:

Labour interaction with communities, Incident prevention and management, OHS monitoring, Health and Hygiene, training are discussed as part of labour management Plan ESS2.

2.4.4 COMMUNICATION AND CONSULTATION (WORKERS & COMMUNITY)

Stakeholder consultation was carried out involving direct workers and community in the month of November & December'2020. Direct workers are well aware of flood & river erosion work and confirmed these activities remain limited to sub-project area only. Community participants welcomed the proposed interventions relating to flood control & erosion management. The participants explicitly mentioned that the river is their lifeline for agriculture, fishing and soil fertility. Strengthening works will help their long term livelihood and therefore welcomed such information. Participants have expressed that they do not have any grievances and as such no grievances were ever reported from their communities/neighborhoods. Consultations will be continued during various phases of the project by FREMAA.

2.4.5 EMERGENCY MANAGEMENT PLAN

Emergency Management Plan should be displayed prominently at work site in local language for ease of understanding of workers and staff. It should contain following information:

1. Name, Designation & Contact Numbers of the site supervisor and alternate to be informed in case of any emergency;
2. Contact details of nearby hospitals, fire department and police department
3. Location of fire extinguishers, first aid boxes, emergency alarm and assembly points
4. Potential Emergencies Situations such as fire, fall, electric shock, etc. & response measures such as use of fire extinguishers, rescue procedures, switching off main power (can be made pictorially).

Responsibility of site supervisor (or his alternate in case he is not present) will be clearly defined including:

1. Assess the level of emergency
2. Providing first aid/organize rescue, as per the emergency situation
3. Assess the need for hospitalization and call ambulance
4. Evacuate the area/limit entry after assessing type of emergency
5. Assess emergency situation and its potential of expanding and inform IA and first responders, as required (fire, police and medical)
6. Prepare accident report – root cause, corrective action and preventive action

2.4.6 REFERENCE TO IFC ENVIRONMENTAL HEALTH AND SAFETY GUIDELINES

The IFC guidelines of environmental health and safety provide detailed guidance note on health and safety requirement and good practices. This manual shall guide contractor and FREMAA while finalizing site specific contractor's EHS management plan.

2.5 Land Acquisition, Restrictions on Land Use and Involuntary Resettlement (ESS5)

(vii) Based on the baseline survey, applicability of ESS5 seems to be very rare in phase-I at Buridihing Basin; and it has not been identified in any of the ESIAs completed so far for Low to Moderate Risk category projects. But bringing in the standard ESMP document for Low to Moderate Risk Category projects with an explicit objective that in case during implementation stage of rehabilitation activities especially in very few exceptional cases, FREMAA can address any relevant issues related to ESS5. This template shall be used on need basis by FREMAA.

Construction stage Impacts: These could include:

- Temporary loss of business
- Land and assets temporarily impacted during construction
- Minor impacts on community resources/Common property resources
- Temporary – short duration or prolonged disruption to services such as water supply, power
- Disruption to traffic movement leading to time delays;

Assessment of Impacts – Nature and Extent

Details on impacts based on enumeration of impacts (Census & Socio-economic survey) is as follows

Table 2.1 – Impact by Activity

S.No.	Type of rehabilitation activity	Type of Impact temporary loss of business/ impact on common property Impact on structure	Number of Impacted Assets	Number of Impacted Persons

Table 2.2 Usages of structure

Number of				
Residential	Commercial	Residential cum commercial	Others (cattle shed, shed etc)	Total

Table 2.3 Typology of affected structures

Number of			
Pucca /Permanent	Semi Pucca	Kutcha	Total

Table 2.4 Type of affected CPR

Number of					
School	**Religious structure**	**Bus Shelter**	**Hand pump**	**Others (ATM Toilet, Compound wall etc**	**Total**

Table 2.5 – Extent of Impacts on structures/Common properties

Name of Structure /CPR	Location	Name of owner	Impact on Structure 1. 1 to10%, 2. 10%to20%, 3. 21%to50%, 4. Above 50%

Table 2.6 Loss of Income (due to loss of temporary access, damage to crops/ trees)

Number of Persons/entities impacted due to			
Loss of access to Shop /Kiosk	**Damage to crop**	**Damage to Trees**	**Loss of income**
Estimated Loss (Amount)			
Loss of access to Shop /Kiosk	**Damage to crop**	**Damage to Trees**	**Loss of income**

Brief Socio-Economic Profile of Impacted Persons/Households: Based on the rapid census and socio-economic survey and consultations, details are given below:

Item	Description	Nos.
Population	Male	
	Female	
	Total	
Religious Group	Hindu	
	Muslim	
	Total	
Social Group	General	
	BC	
	SC	
	ST	
	Total	
Education level of HH	Illiterate	
	New-literate	
	Primary	
	Middle	
	High school	

Item	Description	Nos.
	Intermediate	
	Graduate	
	Post graduate	
	Professional	
	Others	
	Total	
Occupation of HH	Agriculture	
	Trade/Business	
	Petty shop keeping	
	Agri labour	
	Non-Agri labour	
	HH Industries/Artisan activity	
	Service	
	Professional	
	Self employed	
Annual Income	Retired	
	Unemployed	
	Others	
	Total	
	<75000	
	75001 - 1lakh	
	1lakh - 2.5lakh	
	2.5lakh - 5lakh	
	Total	

Entitlement Matrix: Such impacts would be addressed through the relevant provisions outlined in Resettlement Policy Framework

Sl. No.	Impact	Entitled Unit	Entitlement Details
Loss of Livelihood			
1	Temporary loss of business	Business owners	Compensation for temporary loss of income due to loss of access shall be determined as per data on income collected during SIA, and paid commensurate to the period of loss of income **(to be paid by FREMAA)**
Temporary Impact During Construction			
3	Land and assets temporarily impacted during construction	Owners of land and assets	**Temporary losses incurred during construction will be paid by the contractor as determined below:** iii. Damaged structure: Compensation will be estimated as per latest Basic Schedule of Rates (BSR) of Public Works Department, without depreciation iv. Crops and Trees: Compensation for crops & tree damages will be estimated as per Section 29(3) of RFCTLARR Act[71]. All temporary use of land outside ROW, would be

Sl. No.	Impact	Entitled Unit	Entitlement Details
			done based on written / prior approval of landowner and contractor
Loss of Community Infrastructure/Common Property Resources			
2	Structures & other resources (e.g. land, water, access to structures etc.) within the Corridor of Impact (CoI)	Affected communities and groups	Reconstruction of community structure and common property resources, will be done in consultation with community **(costs to be borne by IA)**

Budget for ARAP implementation

Budget for RAP Implementation					
S.No	**Cost Items**	**Unit**	**Rate-Rs**	**Quantity (in sq. mtrs)**	**Amount (in Rs.)**
Compensation for affected part of structure at Replacement Cost					
1	Pucca				
2	Semi Pucca				
3	Kutcha				
Compensation for temporary loss of income (as calculated based on SIA)					
1	Kutcha				
Cost of reconstruction of impacted Common Property					
1	CPR Rehabilitation /Reconstruction Cost				
	Total				

2.6 BIODIVERSITY CONSERVATION MANAGEMENT PLAN (ESS6)

"Protected Area" means a National Park, a sanctuary, a conservation reserve or a community reserve notified under Wildlife Protection Act. Any new or expansion project within or in proximity to protected area, will have to undergo wildlife Clearance, however, flood & river erosion work at existing sub-project in proximity to protected area do not require any clearance/compliances.

WB ESS6, "Biodiversity Conservation and Sustainable Management of Living Natural Resources" requires assessing its applicability to a sub-project during ESIA, keeping in view the potential impact on biodiversity or habitat either positively or negatively, directly or indirectly.

Keeping the above in view, Biodiversity Conservation and Management Plan will be prepared for only those sub-projects which are in close proximity to any of the protected areas, to mitigate potential indirect impacts. The requirement is established during ESIA.

2.6.1 OVERVIEW OF BIODIVERSITY CONSERVATION AND MANAGEMENT PLAN (BCMP)

Area selected for proposed development activities in the 6 sub-projects at Buridihing Basin under Dibrugarh district of Assam do not come in the 10km radius of any 'protected area'. Hence, these 6 sub-projects will not require any bio-diversity conservation and management plan. However basic guidelines as per the national & state legal framework shall be strictly adhered by the contractors & FREMAA.

2.6.2 CONSERVATION AND MANAGEMENT PLAN

Following measures are proposed for conservation of biodiversity:

- Labour will be sensitized to ensure that they do not indulge in tree cutting or hunting.
- Any access/short cut, linking work sites and labour camp through PA will be blocked/fenced
- Project authorities/contractor will be bound by rules and regulation of Wildlife (Protection) Act, 1972 of India and any other rule and guidelines, stipulated by the state Government.
- No dumping site will be identified in the protected area (this is not permitted by law) and no waste dumping (even temporary) will be permitted in that area.
- The project staff and workforce will be appropriately made aware about the importance of biodiversity and shall be advised not to indulge in any illegal activity
- In case of any violation, strict action and penalties would be levied in accordance with the law by appropriate authority.

MONITORING, COMPLIANCE REPORTING AND BUDGET

Physical inspection by Site in Charge (WRD/ FREMAA), before start of work and thereafter every month to check:

- Location of labour camp/colony with respect to conservation area and expected locations of breach
- Route of labour movement from camp to work site and back and any possible interference with the protected area (block any short cuts/access)
- Review of complaints received, if any, reporting labour movement in the protected area and take corrective action
- Review of labour training content and record to ensure labour is sensitized to the need of biodiversity conservation
- Preparing quarterly compliance report

Budget for biodiversity conservation, which largely involve inspection and monitoring by Environmental Specialist, will be part of overall ESMP implementation budget.

2.7 TRIBAL DEVELOPMENT PLAN (ESS7)

2.7.1 TDP TO A SUB-PROJECT

Flood & River erosion work proposed at sub-projects will be limited to that stretches within the existing facilities and no structural interventions are proposed outside, therefore, no direct impact on local community is assessed as part of ESIAs. The project activities do not lead to any direct or indirect impacts on local communities due to structural interventions. Only non-structural interventions such as preparation and implementation of EAP and early flood warning systems will involve engaging with variety of stakeholders including tribal groups, living in the vicinity of the sub-projects and would need to be consulted and informed in culturally appropriate approach – language, techniques that are familiar to them.

Bank ESF (ESS 7 on Tribals) is applicable if:

1. there is a project /activities in Schedule V or VI areas
2. In other areas outside of schedule areas, there are tribal groups who meet the four characteristics as given in para 8 of ESS 7
3. It does not apply if there are tribals in the project area, but such groups are mainstreamed into the general society - tribal and non-tribal living and hence no distinguishing feature exists between them.

Keeping the above in view, TDP will be prepared for only those sub-projects where applicability is established during ESIA.

2.7.2 SOCIAL IMPACTS, IF ANY

Positive Impacts: The tribal households will be indirectly and positively benefited by the safety interventions proposed for each sub-project as these will help improve the overall safety of the river bank protection works. .

Potential adverse impacts:. None

These activities in no way cause restriction on access to land or use of resources by local communities and there is no economic displacement envisaged due to the sub-project.

2.7.3 MEASURES TO AVOID, MINIMIZE IMPACTS, IF ANY

As the structural interventions will not lead to any adverse impacts, no specific mitigation measures are required.

2.7.4 FPIC

ESS7, sets out the requirement of obtaining Free, Prior, and Informed Consent (FPIC) of affected Indigenous Peoples/ Sub-Saharan African Historically Underserved Traditional Local Communities in the three circumstances viz.

(a) have adverse impacts on land and natural resources subject to traditional ownership or under customary use or occupation;

(b) cause relocation of Indigenous Peoples/ Sub-Saharan African Historically Underserved Traditional Local Communities from land and natural resources subject to traditional owner- ship or under customary use or occupation; or

(c) have significant impacts on Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities' cultural heritage that is material to the identity and/or cultural, ceremonial, or spiritual aspects of the affected Indigenous Peoples/ Sub-Saharan African Historically Underserved Traditional

Local Communities' lives.

If any of the above three circumstance will become applicable, project risk category will change from Low to Moderate to Substantial to High. As such none of the three circumstances are found applicable and therefore, for Low to Moderate Risk project. Hence FPIC will not be required.

2.7.5 ACTION PLAN TO BE IMPLEMENTED WITH EAP

.No.	Activities	Q1	Q2	Q3	Q4	Q5
1	Initial kick off meeting with communities including tribal communities on: i. project interventions including likely disruptions if any to water supply ii. preparation of EAP including likely timelines for mapping exercises of emergency resources (e.g. boats, community volunteers, etc.) iii. Inform them of the project level GRM;					
2	For EAP preparation, • hold consultation with general tribal communities involving Gaon-Burha and community members • Hold separate meetings with females, disadvantaged and vulnerable groups					
3	Develop culturally appropriate IEC materials (for STs) for dissemination					
4	Disclose draft EAP at Disclosure event with participationfrom local villages including Gao-Burha					
5	Disseminate key details (or Executive Summary) of EAP by pasting details in local villages					

2.8 CULTURAL HERITAGE PROTECTION PLAN (ESS8)

Cultural Heritage Protection Plan will be applicable to those sub-projects, where cultural heritage of significance is identified within the project area and proposed interventions may have interface with cultural heritage of the area requiring plan for heritage protection during project implementation.

ESS8 recognizes that cultural heritage provides continuity in tangible and intangible forms between the past, present, and future and the CHPP is prepared for those sub projects which are likely to have risks or impacts on cultural heritage.

2.8.1 SCOPE OF CULTURAL HERITAGE PROTECTION PLAN (CHPP):

CHPP shall meet the following aspects:

6. Identify the presence of Archaeological protected monuments, present in sub-project or close vicinity of the sub-project
7. Identify applicable legislative restriction and comply with them.
8. Identify physical, cultural or any religious heritage of importance to communities in the area close to or in the vicinity of sub-project and is/ are likely to have impact

9. Define procedure for minimising the impact if any on cultural heritage of the areas.
10. To define procedure for dealing with chance find

2.8.2 CHPP PREPARATION AND APPROVAL

CHPP shall be prepared prior to start of construction, by Contractor in consultation with FREMAA in accordance with ESMF provisions. However, no cultural heritage sites has been identified within the close vicinity of the priority 6 sub-project at Buridihing River Basin. However, for overall investment it may be kept ready.

2.8.3 CONTENTS OF SITE SPECIFIC CHPP

i. Identification of cultural resources and likely impact from the project
ii. All archeological monument s and physical cultural resources shall be identified.

iii. Undertake community consultation and other stakeholders consultation so that Community consultation and evolve sustainable protection measures.
iv. Identification and Protection of Chance Find: Any chance find of historical or archaeological importance shall be informed to authority concerned and it shall be preserved under secure conditions.
v. Reporting: Contractor shall share the CHPP monitoring reports with Engineer-In-Charge on regular basis.
vi. Responsibility: Prime responsibility of developing and implementation of CHPP shall be of the contractor. However, FREMAA will ensure its preparation and implementation in consultation with the Contractor. FREMAA shall also ensure deployment of experienced Cultural Heritage expert, if required.

2.9 STAKEHOLDER ENGAGEMENT PLAN (ESS10)

2.9.1 IDENTIFICATION OF STAKEHOLDERS

Based on the current set of proposed interventions, the following potential stakeholders were identified and categorized as Affected Stakeholders, Other Interested Stakeholders, and Disadvantaged & Vulnerable Stakeholder.

i. **Affected Persons:** There are no affected persons who shall be directly or indirectly adversely affected by the proposed interventions.

ii. **Other Interested persons**: In relation to structural interventions, these would be contractors, project management consultants, regulatory bodies/institutional stakeholders such as Pollution Control Board, Forest and Wildlife department or other environmental authorities, etc.

iii. **Disadvantaged and Vulnerable Stakeholders**: Illiterate persons, physically challenged, women and elderly would be key stakeholders – requiring special focus and outreach to ensure that they are well informed about the provisions of the EAP.

2.9.2 STAKEHOLDER CONSULTATION

2.9.3 STAKEHOLDER ENGAGEMENT AND PROJECT CYCLE

Table 1 lists the different types of information, relevant target audience depending on the nature of information, modes and frequency of engagement with these stakeholders.

Table 1 – Stakeholder Engagement by Activities				
Information to be disclosed	**Target stakeholders**	**Tools of engagement & mode of disclosure**	**Frequency**	**Responsibility**
Emergency Action Plans (preparation and implementation)	✓ District Administration, ✓ Revenue department ✓ Police ✓ SDMA, DDMA, NDMA ✓ Print and electronic media ✓ Farmers, Communities (affected/ other interested) in the sub-project vicinity	✓ Consultative meetings and EAP Dissemination workshop ✓ Website notifications ✓ SMS alerts ✓ Meetings to inform Village heads or community representatives	✓ Multiple	FREMAA
Provisions related to a. Biodiversity around the sub-projects and clearance if any required b. Cultural, religious or monumental heritage around Sub-project , if exist	✓ Contractor ✓ WRD/ FREMAA staff ✓ Forest Department ✓ Pollution control Board ✓ Department of culture, if required ✓ Farmers, Communities (affected/ other interested) in the sub-projects' vicinity	✓ Consultation meetings related ESIAs and ESMP ✓ Web disclosure of related ESDDs and ESMP	✓ Multiple ✓ Must before work starts ✓ During implementation	FREMAA
Work opportunities for Structural works	✓ Contractors ✓ Consultants	✓ Website notifications ✓ Tender advertisements in newspaper	✓ Multiple ✓ Continuous	FREMAA
Work opportunities for ✓ Petty contracts ✓ Labor	✓ Communities (including disadvantaged persons) ✓ Petty contractor	✓ Website notifications ✓ Meetings to inform Village heads or community representatives	✓ Multiple ✓ Continuous	FREMAA and Contractor
GBV related provisions	✓ FREMAA officials ✓ Contractor personnel ✓ Consultant personnel	✓ Office circular and training events ✓ Website notifications ✓ Bid documents and Contract provisions	✓ Multiple ✓ Continuous	FREMAA
Labor management procedure	✓ FREMAA/ WRD officials ✓ Contractor personnel ✓ Consultant personnel	✓ Website notifications ✓ Bid documents and Contract provisions	✓ Multiple ✓ Continuous	FREMAA
Grievance mechanisms	✓ Communities (affected/ other interested) ✓ Contractors (for procurement related)	✓ Phone number or Toll free Helpline ✓ Display boards at site with GRM information ✓ Consultative meetings ✓ Website notifications ✓ Meetings to inform Village heads or community representatives	✓ Continuous ✓ Multiple	FREMAA

2.9.4 TIMELINES FOR INFORMATION DISCLOSURE AND FEEDBACK

Information to be disclosed with timelines for providing feedback, responding to newspaper advertisements is presented below:

Table 2: Disclosure, feedback and timelines				
Disclosure of information/documents	**Mode of providing feedback**	**Timeline for feedback**	**Conveying of responses by FREMAA**	
			No. of days	**Mode**
ESMF, SEF	Email id/website	-NA-		
Draft ESDDs/ESIAs; draft ESMPs	Email id/website	30 days	Within 7 days of end of feedback period	Website notification
Executive Summaries in local languages of ESMP	Email id/website	30 days	Within 7 days of end of feedback period	Website notification

2.9.5 MONITORING AND REPORTING

Quarterly progress reports of FREMAA to include the following parameters

S. No.	Parameters	Status (Nos./description)
1	Number of consultation meetings conducted within a reporting period (e.g. monthly, quarterly, or annually);	
2	Number and types of IEC materials used	
3	Number of project events published/broadcasted in the local, regional media	
4	Type and frequency of public engagement activities;	
5	Number and type of grievances received within a reporting period (e.g. monthly, quarterly, or annually) and number of those resolved within the prescribed timeline	

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CHAPTER 3: ENVIRONMENTAL AND SOCIAL MITIGATION AND MONITORING PLAN

3.1 PURPOSE OF ES MITIGATION MANAGEMENT AND MONITORING

For the relevant environmental and social risks identified during the ESDD process of the Project, Management Plans are furnished in Chapter 2. This Chapter provides E&S risk/impacts mitigation and management plan, along with monitoring requirement, responsible entity for implementation of mitigation plan as well as monitoring. The mitigation measures are presented ESS wise at Table 3.1.

Table 3.1 Environment and Social Mitigation and Management Plan

Activity and environmental aspects	Environmental and Social Risks/Impacts	Mitigation Measures	Stage of Action	Monitoring Requirements and Frequency	Responsibility of Implementation of Mitigation Measures	Monitoring Responsibility
Labour Camp (ESS 2)	Labour health, Hygiene, Drinking Water availability and Sanitary waste generation	Provide clean, hygienic and safe camp facilities for workers with provision of safe drinking water, separate canteen facility, first aid, periodic health check-up and waste management. Make provision for a adequate numbers of toilets- separate for female and male with sewage collection arrangement & disposal.	Before Construction	Physical Inspection by FREMAA before construction and thereafter every 3 months or if any complaint is received whichever is earlier. Review of complaints should be done every month by FREMAA.	Contractor	FREMAA/ WRD
	Water and Power requirement impacting other competitive users	Source of water and power for labour camp as per advisory from FREMAA/ WRD	Before Construction		Contractor	FREMAA/ WRD
	Tree cutting by labour for cooking and space heating	Provision of community kitchen/kitchen fuel (LPG) for labour. Restriction of cutting any tree.	Before Construction		Contractor	FREMAA/ WRD

	Outside labour, may be bringing in new and infectious diseases not known to area.	Pre deployment health check -up of labour	Before Construction	Review of records of health check-up before start of construction.	Contractor	FREMAA/ WRD
	SEAH/GBV risk within as well as outside the camp	Training and awareness of workers, identification of GBV hotspots and monitoring, establishing GRM mechanism	Entire duration of project	• Review of training records and identified GBV hotspots and monitoring arrangement at start and every 3 months • Monthly Review of complaints received under GRM	Contractor; FREMAA to establish GRM; GBV support	FREMAA/ WRD/ District Administration for GRM
Labour employment and working conditions (ESS 2)	1. Non-payment of wages and overtime 2. Non-compliance to working hours, number of working days per week, rest day and rest time 3. Inadequate facilities at site - drinking water, toilets, food 4. Not providing temporary accommodation for labour free of charge with separate toilet, bathing and lavatory facilities 5. Not providing kitchen and creche, if applicable 6. Employment of child labour	Ensure compliance to BOCW and other applicable legal instruments; latest state government notification issued by Labour Department for minimum wages, working hours, child labour age should be complied with.	Before construction - Contractors Labour License, Insurance, ESI and PF registration Regular review during construction	Document review such as licenses, record register and muster roll; Physical inspection of working condition at site and labour camp; every 3 months or if any complaint is received whichever is earlier; Review of complaints received under GRM every month	Contractor	FREMAA/ WRD
Occupational Health and	1. Unsafe working conditions – poor	1. Contractor/Supervisor will inspect the work sites and mark them as high,	Before construction –	Review of training records, review of availability of	Contractor	FREMAA/ WRD

Activity and environmental aspects	Environmental and Social Risks/Impacts	Mitigation Measures	Stage of Action	Monitoring Requirements and Frequency	Responsibility of Implementation of Mitigation Measures	Monitoring Responsibility
Safety during works (ESS 2)	marking, instructions, 2. Not enough PPEs for all workers; PPEs not appropriate for all types of risks at site or Poor quality PPEs 3. Inadequate training and awareness of workers in use of PPEs and/or in emergency response,	moderate and low risk areas and ensure workers follow instruction to work in these areas 2. Adequate number of good quality appropriate PPEs to be provided by contractor – helmets, gum boots, safety belts, safety harness, gloves, overalls, ear plugs, face masks, etc. 3. All workers should be provided with training on use of appropriate PPEs and how to respond during emergency 4. Adequate EHS instructions shall be displayed at site 5. Provision of First aid with availability of trained first aiders shall be ensured 6. SOP shall be developed as per best practices and IFC EHS guidelines for unsafe conditions like working on height, working in confined areas, electrical safety, fall prevention, handling of hazardous material like welding gases 7. Adequate provision of life jacket if working on reservoir side 8. Procedure of incident prevention, investigation and corrective preventive action	training and availability of PPEs During construction – marking of areas as per risks, rehearsing emergency response and identify training needs	PPEs, Review of accident records and corrective preventive action reports – before start of construction thereafter every 3 months		
COVID 19 conditions	Global Pandemic seriously affecting the employment of labor and working conditions	• Appointing a COVID-19 focal point with responsibility for monitoring and reporting on COVID-19 issues, and liaising with other relevant parties	Before start of mobilization of workers	First hand monitoring and review	Contractor and FREMAA	Contractor and FREMAA
Use of resources – water, power and raw	Resource wastage, impact on land environment while procuring material from quarry/borrow	Resource planning will be done by contractor in consultation with engineer in charge (Estimate of material requirement from quarry/borrow area, identification of nearest locations with approval status . Ensure that	Before start of construction work	Review of resource planning ensuring efficiency Review of quarry and borrow material requirement	Contractor with FREMAA	FREMAA

Activity and environmental aspects	Environmental and Social Risks/Impacts	Mitigation Measures	Stage of Action	Monitoring Requirements and Frequency	Responsibility of Implementation of Mitigation Measures	Monitoring Responsibility
material for floow & river erosion management work. (ESS 3)	areas	material is sourced from quarries or borrow areas which has valid environmental clearance.		with approval status, validity and environment clearance – once before start of construction		
Pollution generation from rehabilitation work sites and labour camp (ESS 3)	1. Air and noise emissions from storage and handling of raw material and during execution of civil work & DG Set. 2. Water pollution from construction activities and from labour camp 3. Debris waste generation from excavation work, if any, and debris generation from repair work 4. Hazardous waste generation from civil construction work.	1. Ensuring covered storage of lose material/sprinkling of water to minimize fugitive emissions 2. Maintaining construction equipment and ensuring DG set used for power have valid certificate of Type Approval and also valid certificates of Conformity of Production as per conformance labelling. DG stack height shall be as per the Consent to be obtained from State Pollution Control Board before start of work. 3. Ensuring use of dust masks, if workers are exposed to dust emissions and ear muffs for exposure to high noise for long durations 4. Provision of mobile toilets at work site 5. Wastewater from construction sites not to be discharged untreated (compliance with general discharge standards) 6. Construction debris to be disposed off at pre-identified and approved site 7. Hazardous waste (Empty barrels/containers/liners contaminated with hazardous chemicals /wastes; Contaminated cotton rags or other cleaning materials) to be separately stored and disposed off to authorized vendors only	During entire project duration	Ambient Air Quality Monitoring only for projects which are in close proximity to protected areas and shall be based on activities/component proposed($PM_{2.5}$, PM_{10} and SO_2 for 24 hours) at 2 major construction sites, before start of construction (as identified by Engineer in charge) once during construction and once at the end of rehabilitation work Sound Level monitoring (dB(A) levels) only for projects which are in close proximity to protected areas at 2 major construction sites (as identified by engineer in charge), once before start of construction once during construction and once at the end of construction work	Contractor through NABL accredited Lab; Contractor	FREMAA

Activity and environmental aspects	Environmental and Social Risks/Impacts	Mitigation Measures	Stage of Action	Monitoring Requirements and Frequency	Responsibility of Implementation of Mitigation Measures	Monitoring Responsibility
				Monthly physical inspection to ensure wastewater from rehabilitation work is not being disposed off in river; debris is being disposed off at identified locations. soil level : near construction camp site or active work site area where probability of waste discharge exists Physical inspection of use of PPEs, review of DG specification, wastewater discharge, debris handling and disposal – every month Physical inspection of segregation, storage and disposal of hazardous waste to authorised vendor – every month		
Transport of material to project site through village roads. (ESS 4)	Increase in the traffic on village roads leading to air and noise emissions as well as risk of accidents.	1. All vehicles used by contractors for transportation of persons and material should have valid PUC 2. Lose material should only be transported in covered vehicles	During entire duration of project	Physical inspection and review of documents before construction and thereafter every 3 months or if any complaint is received whichever is earlier	Contractor	FREMAA
Impacts on Agricultural Land/ structures/	Temporary loss of business Land and assets temporarily impacted	As per ESMP section 2.5	Pre- construction	Ongoing	FREMAA	FREMAA

Activity and environmental aspects	Environmental and Social Risks/Impacts	Mitigation Measures	Stage of Action	Monitoring Requirements and Frequency	Responsibility of Implementation of Mitigation Measures	Monitoring Responsibility
assets (ESS5)	during construction Minor impacts on community resources/Common property resources					
Biodiversity Conservation for sub-projects in close proximity to Protected area as per ESMP (ESS 6)	Indirect impacts due to rehabilitation work in proximity to protected areas involving limited outside labour	As per ESMP on Biodiversity Conservation & Management Plan	Before start of construction	Physical inspection of location of labour camp wrt PA before start of construction	Contractor and FREMAA	FREMAA
Tribal Development Plan for sub-projects in Schedule V or VI areas preparing EAP and other locations wherein there are tribals as per characteristics of ESS 7	Non-structural interventions such as preparation and implementation of EAP and early flood warning systems will involve consultation with variety of stakeholders including tribal groups, living in the vicinity of the sub-project and would need to be consulted and informed in culturally appropriate approach–	During EAP Implementation: 1. Identification of scheduled areas and tribal clusters to prioritize targeting of dispersed indigenous communities in the non-tribal areas as well as for clear targeting of tribal in the schedule V and VI areas 2. Development of culturally appropriate Information Education and Communication (IEC) materials for dissemination in the project areas to avoid panic/rumours and providing correct and accurate information in a manner understood to locals 3. Deployment of local (tribal) Community Facilitators to hold consultations and generate awareness in tribal areas on EAP provisions and implementation.	During implementation of EAP	Review of Plan of engagement of tribal population for EAP implementation Review of complaints received before start of construction	Contractor/ FREMAA	World Bank

Activity and environmental aspects	Environmental and Social Risks/Impacts	Mitigation Measures	Stage of Action	Monitoring Requirements and Frequency	Responsibility of Implementation of Mitigation Measures	Monitoring Responsibility
(ESS 7)	language, techniques that are familiar to them.	4.				
Cultural Heritage for sub projects impacting any protected monuments as identified in ESDD (ESS 8)	Damage to monument/site of cultural heritage	1. Before start of construction, joint inspection by contractor and IA, of cultural heritage site will be undertaken 2. Work plan will be prepared to ensure no direct/indirect impact from work. 3. Labour interference or labour access to the site will be prohibited 4. ASI rules for visit to site or any other regulation will be strictly adhered to 5. Training and awareness of labour to cover protection of site	Before start of construction	Review of work plan vis-à- vis protection requirement to cultural heritage Review of training records	Contractor and FREMAA	WB
Stakeholder Engagement Plan (ESS 10)	stakeholder participation, implementing the grievance mechanism, ensuring continuous information transfer through open communication	Grievance mechanism EAP consultations, dissemination material, awareness sessions, print and electronic media campaigns	Early in the project Throughout the project across various activities		FREMAA	WB

3.2 ES MITIGATION AND MONITORING PLAN – ACTION RESPONSIBILITY MATRIX

Various preparatory action and plans are to be prepared before start of construction work by contractor and Implementing Agency (Reference Chapter 2 and section 3.1) Table below lists actions to be taken by contractor and FREMAA.

By Contractor		
Specific Action/ Preparation requirements	**Reference Document /format**	**Stage of Action /Frequency**
Preparation of Labour Camp Plan	Number of workers, number of units required, duration of stay; facilities proposed to be provided – toilets, kitchen drinking water, waste management	Once - Before start of work
Health check-up of workers (if workers are planned to stay at site for more than six months)	Health check records	Once - Before start of work
Training and awareness of labour – GBV/ SEA, Code of Conduct, OHS requirements	Topics covered, date of training and attendance	First before start of work, thereafter after every 3 months
Compliance to labour laws	Copy of Labour license, ESI, PF	First before start of work, thereafter as per expiry/renewal
Identification of hazardous working locations and marking and emergency response plan	List of risky activities	Before start of work
Availability of PPEs	List of PPEs – number of each type	Before start of work
Training of workers on use of PPEs and Emergency Response	Training records	First before start of work, thereafter after every 3 months
Ambient air quality and sound level monitoring for projects in close proximity to protected areas	As per the report of NABL accredited lab	Before start of work, during construction and at the end of rehabilitation work
Identification of authorized vendor of hazardous waste	Name of the vendor, status of authorization and copy of authorization	Before start of work
Identification of approved quarry/borrow area	Name of the supplier, copy of approval	Before start of work
Submission of Quarterly Progress Report		Within 2 weeks of end of every 3 months period from start date

By FREMAA supported by PMTC	
Specific Action/Preparation requirements	**Timeline/Frequency**
Identification of suitable location of labour camp, if applicable	Before start of work
Identification of source of water and power for labour camp, if applicable	Before start of work
Identification of GBV hotspots	Before start of work
Approval of quarry/borrow area	Within one week of submission of details by contractor
Identification of ambient air quality and sound level monitoring locations for projects in close proximity to protected areas and shall be activity specific.	Before start of work
Identification of debris disposal location	Before start of work
Establishing GRM and its awareness - poster/signage with contact details	Before start of work
Ensuring effectiveness of GRM and review of complaints received	Every month during the entire duration of project implementation
Inspection of labour camp ensuring adequate facility	First on set up, thereafter every 3 months
Reviewing contractors documents and ensuring compliance to labour laws	First on setup, thereafter every 3 months
Ascertaining adequacy of good quality PPEs	Once before start of work, thereafter every 3 months
Physical inspection at work site - air emissions, noisy operations, use of PPEs	Every month during the entire duration of work
Submission of Quarterly Progress Report	Within one month, from end of every 3 months period from start date

CHAPTER 4. IMPLEMENTATION ARRANGEMENTS AND ESMP BUDGET

The ESMP implementation is mainly the responsibility of Contractor engaged for the works. FREMAA is responsible for Sub-Project level activities not directly addressed by Contractor such as GBV referral mechanism, Stakeholder engagement etc. The PMC engaged by FREMAA will support FREMAA in implementation monitoring of ESMP.

In compliance with ESMF, the framework provisions of ESMP, which shall be implemented by Contractor will be included as part of Bids and the Contractor upon boarding shall submit C-ESMP with updated inputs on management plans. The ESMP will be updated, should additional information/ impacts are determined during the project.

4.1 IMPLEMENTATION AND SUPERVISION ARRANGEMENTS

Table below outlines the management measures and implementation and supervision arrangements for the various activities at different stages of the project.

S. No	Project Stage/Activity	Management Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
1	Establishing Labour Camp before start of construction, if required	Provision of separate toilets for male and female, sanitation and waste collection & disposal facilities, provision of kitchen fuel/community kitchen	**Contractor**	Engineer In-Charge (WRD)
2	Health check of labour before induction(in case outside labor are proposed to employ and stay for more than six months)	Health from an authorized government hospital/dispensary and submission of record	Contractor	Engineer In-Charge (WRD)
3	Compliance to labour laws - before start of construction	Ensure compliance to BOCW and other applicable legal instruments including; latest state government notification issued by Labour Department for minimum wages, working hours, child labour age.	Contractor	Engineer In-Charge (WRD)
4	Identification of GBV hotspots and accident	Physical survey and hotspot identification	E&S Specialist (FREMAA)	Engineer In-Charge (WRD)

S. No	Project Stage/Activity	Management Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
	hotspots on transport route before start of construction			
5	Workers training	Workers training covering SEA/SEAH and GBV risks and consequences, OHS training and emergency actions, Code of Conduct – awareness and acceptance; biodiversity conservation	Contractor	FREMAA
6	Occupational Health and Safety of workers during entire duration of project	1. Contractor/Supervisor will inspect the work sites and identify the high risk areas, if any; ensures workers follow instruction to work in these areas 2. Adequate number of good quality appropriate PPEs to be provided by contractor – helmets, gum boots, safety belts, safety harness, gloves, overalls, ear plugs, face masks, etc. 3. All workers should be provided with training on use of appropriate PPEs and how to respond during emergency	Contractor	Engineer in Charge (WRD)
7	Resource planning before start of construction	1 Resource planning will be done by contractor in consultation with engineer in charge (requirement of water and power at various location for construction work and labour camp) 2 Estimate of material requirement from quarry/borrow area, identification of nearest locations with approval status	Contractor	Engineer in Charge (WRD)
8	Pollution prevention during entire project duration	1. Ensuring covered storage of lose material/sprinkling of water to minimise fugitive emissions. 2. Maintaining construction equipment and ensuring DG set used for power have valid certificate of Type Approval and also valid certificates of Conformity of Production as per conformance labelling 3. Ensuring use of dust masks, if workers are exposed to dust emissions and ear muffs for exposure to high noise for long durations 4. Provision of mobile toilets at work site 5. Wastewater from construction sites	Contractor	Engineer in Charge (WRD)

S. No	Project Stage/Activity	Management Measures	Responsibility	
			Planning and Execution	Supervision/ Monitoring
		not to be discharged untreated (compliance with general discharge standards) 6. Construction debris to be disposed off at pre-identified and approved site 7. Hazardous waste (Empty barrels/containers/liners contaminated with hazardous chemicals /wastes; Contaminated cotton rags or other cleaning materials) to be separately stored and disposed off to authorised vendors only		
9	Safe transportation of man and material during entire duration of project	1. All vehicles used by contractors for transportation of persons and material should have valid PUC 2. Lose material should only be transported in covered vehicles	Contractor	Engineer in Charge (WRD)
10	Inspection of Labour Camp wrt to Conservation Reserve	1. Physical inspection ensuring no easy access to conservation reserve from work site/labour camp and shortcuts 2. Blocking of access/shortcuts	E&S Experts	Engineer in Charge (WRD)
11	EHS monitoring	To be undertaken throughout the project implementation period with inspection by E& S staff of contractor monthly and report submission	E&S experts of contractor	FREMAA

Reporting by contractor and monitoring by FREMAA

Contractor will prepare a Monthly Progress report (QPR) and submit to EO-NT,FREMAA giving the compliance of ESMP. Details will include status on:

1. Progress on ESMP implementation work plan.
2. Status of Compliance with E&S statutory requirements such as labour licenses, insurance, etc.
3. ESHS incidents & supervision.
4. Usage (no. required, distributed and used) of Personal Protective Equipment (PPE) such as hard hats, safety shoes and safety vests by workers.
5. Safety at work sites like COVID incidents, providing traffic signage, barriers/delineator, management of traffic, drainage and pliable road surface etc.
6. Training conducted, and worker's participation (submit reports with statistics of training and worker's participation).
7. Functioning of GRM relating to labour aspects, including summary details of Workers grievances, if any.

8. Community grievances, if any.
9. Corrective Actions and planned E&S activities for next quarter.

FREMAA will prepare its quarterly monitoring report and submit the same along with contractors report to World Bank.

ANNEXURE 1 to ESMP: OUTLINE OF CONTRACTOR'S ESMP

(will cover all on site issues and responsibility with management; include chance find procedure if applicable)

1. **Sub-project activities description under Contractor's Scope**
2. **Licensing Requirement**
   - 2.1 Labour License
   - 2.2 Insurance
   - 2.3 Use of approved quarry/borrow areas, if such material is required
   - 2.4 Any other
3. **Workforce management under COVID 19 considerations, if applicable**
   - 3.1. Profile of work force – work activities, schedule, contract duration, workforce rotation plan, workers place of stay, workers with underlying health issues
   - 3.2. Measures to mitigate risks on account of COVID 19
   - 3.3. Contingency plan covering – pre-health checkup, access restrictions, hygiene, waste management, accommodation arrangements, PPE provision and usage
   - 3.4. Reporting and handling of Instances of COVID 19 cases, training and communication with workers, training and SOPs on communicating and contact with community
4. **Labour Camp (if outside labour is accommodated in a labour camp)**
   - 4.1. Location of Labour Camp
   - 4.2. Number of labour to be housed and duration
   - 4.3. Break-up of labour workforce – male, female, children
   - 4.4. Number of Units in Labour Camp
   - 4.5. Source and Provision of Water and Power Connection including Drinking Water
   - 4.6. Cooking Arrangement – Individual Kitchen/community Kitchen
   - 4.7. Source, Type and Provision of Kitchen Fuel
   - 4.8. Toilet facilities – individual/community; fixed/mobile and sewage disposal arrangement
   - 4.9. Waste collection and disposal arrangement
   - 4.10. Identify Risk of Community Interface – any fencing/separation requirement
   - 4.11. Security & General Lighting Arrangement
5. **Resource Planning**
   - 5.1. Water and power requirement for works and locations
   - 5.2. Need for water line or electrical wiring
   - 5.3. Raw material requirement and source(s)
   - 5.4. Temporary storage(s) at site and location(s) – cover/uncovered
   - 5.5. Transportation route from source to storage

6. Pollution Prevention

6.1. Potential of dust emission from openly stored raw material and mitigation arrangement – covering, sprinkling, etc.

6.2. Potential of water pollution from spillage and leakage from raw material storage and preventive measures

6.3. Potential of air emissions from works including toxic emissions from paints and chemicals, emissions from DG sets and other construction equipment – locations where potential is high, possibility of community impact, impact on workers, preventive measures such as dust masks for workers, etc.

6.4. Potential of noise generation from works (use of equipment and machinery, demolition work) including from any activity planned at nigh time – locations where potential is high, possibility of community impact, impact on workers, preventive measures such as ear muffs, etc.

6.5. Potential of water pollution from works – possibility of leakage to surface water or accumulation in low lying areas; preventive measures/treatment requirement

6.6. Estimate of excavated earth/construction debris requiring disposal – quantum, sources(s) of generation, identified dumping sites, transportation mode and route, period of dumping and restoration plan

7. Occupation Health & Safety and Emergency Management

7.1. PPE requirement and numbers

7.2. Lists of tasks and work zone critical for hazard prevention, if any

7.3. Location of warning signage for hazard prevention

7.4. Requirement of first aid boxes and portable fire extinguishers

7.5. Key person(s) to be contacted during emergency

7.6. Protocol for deciding the level of emergency – need for hospitalization, information to authorities, etc.

7.7. Process of accident analysis, corrective and preventive measures and need for reporting

8. **Addressing GBV**

8.1. Preventive measures – provision of lighting, separate toilet areas for men and women, increased vigil and security arrangement for community sensitive GBV hotspots, if identified by FREMAA.

8.2. Sensitizing and awareness of labour on GBV issues including penalties and legal action against offenders

8.3. Awareness about GRM

9. Code of Conduct

9.1. Preparation of Code of conduct

9.2. Making labour aware of conduct with all the provisions, do's and don'ts, penalties for non-compliances, etc.

9.3. Displaying CoC at prominent locations

9.4. Signing of CoC by workers

10. Awareness and Training

10.1 Plan for training and awareness covering Pollution Prevention, OHS, Use of PPEs, Accident reporting and emergency management, CoC, GBV, GRM, etc.

10.2 Training schedule

10.3 Training records

Appendix 1 to ESMP

Environmental & Social Monitoring Plan during Construction Phase

Environmental / Social component	Parameters to be monitored	Location	Frequency	Responsible Agency	
				Implemented by	Supervised by
Construction Stage					
Ambient Air Quality	PM10, PM2.5, SOx, NOx, CO	Sub-Project Site	1 sample/ location/ Quarter (i.e.,4 Samples/Year)	Contractor through a CPCB/SPCB recognized laboratory	WRD/ FREMAA
		Along the Stretch	1 sample/ location/ Quarter (i.e.,4 Samples/Year)		
Noise	Leq dB (A) (Day and Night) Average and Peak values	Sub-Project sites	2 Samples/ location/season (I.e., 6 Samples/Year)	Contractor through a CPCB/SPCB recognized laboratory	WRD / FREMAA
		Under water noise monitoring	3 Samples/ Location/Quarter (i.e.,12 Samples/Year)		
Water Quality (Drinking water)	pH, temperature, DO, BOD, COD, Oil & Grease, Total Suspended Solid, turbidity, Total Hardness, Chlorine, Iron, As, Total Coliform	Labour Camp	3 sample/location/ quarterly	Contractor through a CPCB/SPCB recognized laboratory	WRD / FREMAA
Water Quality (Surface Water)	pH, temperature, DO, BOD, COD, Oil & Grease, Total Suspended Solid, turbidity, Total Hardness, Chlorine, Iron, As, Total Coliform	At Sub-Project (Stretche) site	3 Samples/ Location/Year (i.e., Sample to be collected for three seasons (Pre-monsoon, monsoon & post monsoon or winter) at each location).	Contractor through a CPCB/SPCB recognized laboratory	WRD / FREMAA
Water Quality (Ground Water)		At Sub-Project site	3 Samples/ Location/Year (i.e., Sample to be collected for three seasons (Pre-monsoon, monsoon & post monsoon or winter) at each location).		
Soil Quality	Pb, Cd, Cr, Cu, Zn, Mn, As, Se, Hg, PCBs, POPs, and hydrocarbons	At Sub-project site	3 Samples/ Location/Year (i.e., Sample to be collected for three seasons (Pre-	Contractor	WRD / FREMAA

Environmental / Social component	Parameters to be monitored	Location	Frequency	Responsible Agency	
				Implemented by	Supervised by
			monsoon, monsoon & post monsoon or winter) at each location).		
Ecology & Biodiversity	The practices mentioned in biodiversity management plan are to be followed.	At Sub-Project site	Once in Six months.	Contractor	WRD / FREMAA
River Bed Sediments	PCBs, POPs, Hydrocarbons, Heavy Metals (Lead Arsenic, Cadmium Mercury)	At sub-Project site	4 Samples/ Location/Year (i.e., Sample to be collected for three seasons (Pre-monsoon, monsoon & post monsoon or winter) at each location).	Contractor	WRD / FREMAA
Dredged Material Management		At Sub-project Site	Daily	Contractor	WRD / FREMAA
Community Health & Safety		At all locations	Weekly	Contractor	WRD /FREMAA
GBV Gneder Based Violance)				Contractor	FREMAA
Waste Mangement		At all locations	Daily	Contractor	WRD / FREMAA
Incedents/ Accident	Maintaining Registrar	At all locations	Daily	Contractor/ Site-Incharge (FREMAA/WRD)	FREMAA/ WRD/ District Administration
Grievances	Maintaing Registrar	At all locations	Daily	Site-Inchrage (FREMAA/ WRD)	District Administration/ WRD/ FREMAA

Appendix 2 to ESMP

Environmental Codes of Practice (ECoPs) & other Plans to be followed by the Contractor

The environmental codes of practice (ECoPs) are generic, non-site-specific guidelines. The ECoPs consist of environmental management guidelines and practices to be followed by the contractors for management of all environmental issues. The contractor will be required to follow them by preparing site-specific management plans. The ECoPs are listed below and detailed in table below-

- ECoP 1: Waste Management
- ECoP 2: Fuels and Hazardous Substances Management
- ECoP 3: Water Resources Management
- ECoP 4: Drainage Management
- ECoP 5: Soil Quality Management
- ECoP 6: Erosion and Sediment Control
- ECoP 7: Top Soil Management
- ECoP 8: Topography and Landscaping
- ECoP 9: Borrow Areas Management
- ECoP 10: Air Quality Management
- ECoP 11: Noise and Vibration Management
- ECoP 12: Protection of Flora
- ECoP 13: Protection of Fauna
- ECoP 14: Protection of Fisheries
- ECoP 15: Road Transport and Road Traffic Management
- ECoP 16: River Transport management
- ECoP 17: Construction Camp Management
- ECoP 18: Cultural and Religious Issues
- ECoP 19: Workers Health and Safety
- EcoP 20: Dredging Management

Environmental Code of Practices (ECoPs) for Contractor

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
ECoP 1: Waste Management		
General Waste	Soil and water pollution from the improper management of wastes and excess materials from the construction sites.	The Contractor shall • Develop waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food waste etc.) prior to commencing of construction and submit to Construction Contractor for approval. • Organize disposal of all wastes generated during construction in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact. • Minimize the production of waste materials by 3R (Reduce, Recycle and Reuse) approach. • Segregate and reuse or recycle all the wastes, wherever practical. • Prohibit burning of solid waste • Collect and transport non-hazardous wastes to all the approved disposal sites. Vehicles transporting solid waste shall be covered with tarps or nets to prevent spilling waste along the route • Train and instruct all personnel in waste management practices and procedures as a component of the environmental induction process. • Provide refuse containers at each worksite. • Request suppliers to minimize packaging where practicable. • Place a high emphasis on good housekeeping practices. • Maintain all construction sites in a cleaner, tidy and safe condition and provide and maintain appropriate facilities as temporary storage of all wastes before transportation and final disposal.
Hazardous Waste	Health hazards and environmental impacts due to improper waste management practices	The Contractor shall • Collect chemical wastes in large drums (or similar sealed container), appropriately labeled for safe transport to an approved chemical waste depot. • Store, transport and handle all chemicals avoiding potential environmental pollution. • Store all hazardous wastes appropriately in areas away from water courses. • Make available Material Safety Data Sheets (MSDS) for hazardous materials on-site during construction. • Collect hydrocarbon wastes, including lube oils, for safe transport off-site for reuse, recycling, treatment or disposal at approved locations. • Construct concrete or other impermeable flooring to prevent seepage in case of spills
ECoP 2: Fuels and Hazardous Goods Management		
Fuels and hazardous goods.	Materials used in construction have a potential to be a source of contamination. Improper storage and handling of fuels, lubricants, chemicals	The Contractor shall • Prepare spill control procedures and submit the plan for Construction Contractor approval. • Train the relevant construction personnel in handling of fuels and spill control procedures.

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
	and hazardous goods/materials on-site, and potential spills from these goods may harm the environment or health of construction workers	• Store dangerous goods in bunded areas on a top of a sealed plastic sheet away from watercourses. • Refueling shall occur only within bunded areas. • Make available MSDS for chemicals and dangerous goods on-site. • Transport waste of dangerous goods, which cannot be recycled, to a designated disposal site approved by DoE. • Provide absorbent and containment material (e.g., absorbent matting) where hazardous material are used and stored and personnel trained in the correct use. • Provide protective clothing, safety boots, helmets, masks, gloves, goggles, to the construction personnel, appropriate to materials in use. • Make sure all containers, drums, and tanks that are used for storage are in good condition and are labeled with expiry date. Any container, drum, or tank that is dented, cracked, or rusted might eventually leak. Check for leakage regularly to identify potential problems before they occur. • Store hazardous materials above flood plain level. • Put containers and drums in temporary storages in clearly marked areas, where they will not be run over by vehicles or heavy machinery. The area shall preferably slope or drain to a safe collection area in the event of a spill. • Put containers and drums in permanent storage areas on an impermeable floor that slopes to a safe collection area in the event of a spill or leak. • Take all precautionary measures when handling and storing fuels and lubricants, avoiding environmental pollution. • Avoid the use of material with greater potential for contamination by substituting them with more environmentally friendly materials. • Return the gas cylinders to the supplier. However, if they are not empty prior to their return, they must be labeled with the name of the material they contained or contain, information on the supplier, cylinder serial number, pressure, their last hydrostatic test date, and any additional identification marking that may be considered necessary.
ECoP 3: Water Resources Management		
Hazardous Material and Waste	Water pollution from the storage, handling and disposal of hazardous materials and general construction waste, and accidental spillage	The Contractor shall • Follow the management guidelines proposed in ECoPs 1 and 2. • Minimize the generation of sediment, oil and grease, excess nutrients, organic matter, litter, debris and any form of waste (particularly petroleum and chemical wastes). These substances must not enter waterways, storm water systems or underground water tables

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Discharge from construction sites	During construction both surface and groundwater quality may be deteriorated due to construction activities in the river, sewerages from construction sites and work camps. The construction works will modify groundcover and topography changing the surface water drainage patterns of the area including infiltration and storage of storm water. These changes in hydrological regime lead to increased rate of runoff, increase in sediment and contaminant loading, increased flooding, groundwater contamination, and effect habitat of fish and other aquatic biology.	The Contractor shall • Install temporary drainage works (channels and bunds) in areas required for sediment and erosion control and around storage areas for construction materials • Install temporary sediment basins, where appropriate, to capture sediment-laden run-off from site • Divert runoff from undisturbed areas around the construction site • Stockpile materials away from drainage lines • Prevent all solid and liquid wastes entering waterways by collecting solid waste, oils, chemicals, bitumen spray waste and wastewaters from brick, concrete and asphalt cutting where possible and transport to an approved waste disposal site or recycling depot • Wash out ready-mix concrete agitators and concrete handling equipment at washing facilities off site or into approved bunded areas on site. Ensure that tires of construction vehicles are cleaned in the washing bay at the entrance of the construction site) to remove the mud from the wheels. This shall be done in every exit of each construction vehicle to ensure the local roads are kept clean
Soil Erosion and siltation	Soil erosion and dust from the material stockpiles will increase the sediment and contaminant loading of surface water bodies.	The Contractor shall • Stabilize the cleared areas not used for construction activities with vegetation or appropriate surface water treatments as soon as practicable following earthwork to minimize erosion • Ensure that roads used by construction vehicles are swept regularly to remove sediment. • Water the material stockpiles, access roads and bare soils on an as required basis to minimize dust. Increase the watering frequency during periods of high risk (e.g. high winds)
Construction activities in water bodies	Construction works in the water bodies will increase sediment and contaminant loading, and effect habitat of fish and other aquatic biology	The Contractor Shall • Dewater sites by pumping water to a sediment basin prior to release off site – do not pump directly off site • Monitor the water quality in the runoff from the site or areas affected by dredge plumes, and improve work practices as necessary • Protect water bodies from sediment loads by silt screen or bubble curtains or other barriers • Minimize the generation of sediment, oil and grease, excess nutrients, organic matter, litter, debris and any form of waste (particularly petroleum and chemical wastes). These substances must not enter waterways, storm water systems or underground water tables. • Use environment friendly and nontoxic slurry during construction of piles to discharge into the river. • Reduce infiltration of contaminated drainage through storm water management design • Do not discharge cement and water curing used for cement concrete directly into water courses and drainage inlets

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Drinking water	Groundwater at shallow depths is contaminated with arsenic and hence not suitable for drinking purposes. Depletion and pollution of groundwater resources	The Contractor Shall • Pumping of groundwater shall be from deep aquifers of more than 300 m to supply arsenic free water. Safe and sustainable discharges are to be ascertained prior to selection of pumps. • Tube wells will be installed with due regard for the surface environment, protection of groundwater from surface contaminants, and protection of aquifer cross contamination • All tube wells, test holes, monitoring wells that are no longer in use or needed shall be properly decommissioned • Install monitoring wells both upstream and downstream areas near construction yards and construction camps to regularly monitor the water quality and water levels. • Protect groundwater supplies of adjacent lands
ECoP 4: Drainage Management		
Excavation and earth works, and construction yards	Lack of proper drainage for rainwater/liquid waste or wastewater owing to the construction activities harms environment in terms of water and soil contamination, and mosquito growth	The Contractor shall • Prepare a program for prevent/avoid standing waters, which Construction Contractor will verify in advance and confirm during implementation • Provide alternative drainage for rainwater if the construction works/earth-fillings cut the established drainage line • Establish local drainage line with appropriate silt collector and silt screen for rainwater or wastewater connecting to the existing established drainage lines already there • Rehabilitate road drainage structures immediately if damaged by contractors' road transports. • Build new drainage lines as appropriate and required for wastewater from construction yards connecting to the available nearby recipient water bodies. Ensure wastewater quality conforms to the relevant standards provided by DoE, before it being discharged into the recipient water bodies. • Ensure the internal roads/hard surfaces in the construction yards/construction camps that generate has storm water drainage to accommodate high runoff during downpour and that there is no stagnant water in the area at the end of the downpour. • Construct wide drains instead of deep drains to avoid sand deposition in the drains that require frequent cleaning. • Provide appropriate silt collector and silt screen at the inlet and manholes and periodically clean the drainage system to avoid drainage congestion • Protect natural slopes of drainage channels to ensure adequate storm water drains. • Regularly inspect and maintain all drainage channels to assess and alleviate any drainage congestion problem. • Reduce infiltration of contaminated drainage through storm water management design

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Ponding of water	Health hazards due to mosquito breeding	• Do not allow ponding of water especially near the waste storage areas and construction camps • Discard all the storage containers that are capable of storing of water, after use or store them in inverted position
ECoP 5: Soil Quality Management		
Filling of Sites with dredge spoils	Soil contamination will occur from drainage of dredged spoils	The Contractor shall • Ensure that dredged sand used for land filling shall be free of pollutants. Prior to filling, sand quality shall be tested to confirm whether soil is pollution free. Sediments shall be properly compacted. Top layer shall be the 0.5 m thick clay on the surface and boundary slopes along with grass. Side Slope of Filled Land of 1:2 shall be constructed by suitable soils with proper compaction as per design. Slope surface shall be covered by top soils/ cladding materials (0.5m thick) and grass turfing with suitable grass. • Leaching from the sediments shall be contained to seep into the subsoil or shall be discharged into settling lagoons before final disposal. • No sediment laden water in the adjacent lands near the construction sites, and/or wastewater of suspended materials excessive of 200mg/l from dredge spoil storage/use area in the adjacent agricultural lands
Storage of hazardous and toxic chemicals	Spillage of hazardous and toxic chemicals will contaminate the soils	The Contractor shall • Strictly manage the wastes management plans proposed in ECoP1 and storage of materials in ECoP2 • Construct appropriate spill contaminant facilities for all fuel storage areas • Establish and maintain a hazardous materials register detailing the location and quantities of hazardous substances including the storage, use of disposals • Train personnel and implement safe work practices for minimizing the risk of spillage • Identify the cause of contamination, if it is reported, and contain the area of contamination. The impact may be contained by isolating the source or implementing controls around the affected site • Remediate the contaminated land using the most appropriate available method to achieve required commercial/industrial guideline validation results.
Construction material stock piles	Erosion from construction material stockpiles may contaminate the soils	The Contractor shall • Protect the toe of all stockpiles, where erosion is likely to occur, with silt fences, straw bales or bunds
ECoP 6: Erosion and Sediment Control		
Clearing of construction sites	Cleared areas and slopes are susceptible for erosion of top soils, that affects the growth of vegetation which causes ecological imbalance	• Reinstate and protect covered areas as soon as possible • Mulch to protect batter slopes before planting • Cover unused area of disturbed or exposed surfaces immediately with mulch/grass turfings/tree plantations
Construction activities and material stockpiles	The impact of soil erosion are (i) Increased run off and sedimentation causing a greater flood hazard to the	The Contractor shall • Locate stockpiles away from drainage lines • Protect the toe of all stockpiles, where erosion is likely to occur, with silt fences, straw bales or bunds

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
	downstream, (ii) destruction of aquatic environment in nearby lakes, streams, and reservoirs caused by erosion and/or deposition of sediment damaging the spawning grounds of fish, and (iii) destruction of vegetation by burying or gullying.	• Remove debris from drainage paths and sediment control structures • Cover the loose sediments and water them if required • Divert natural runoff around construction areas prior to any site disturbance • Install protective measures on site prior to construction, for example, sediment traps • Control drainage through a site in protected channels or slope drains • Install 'cut off drains' on large cut/fill batter slopes to control water runoff speed and hence erosion • Observe the performance of drainage structures and erosion controls during rain and modify as required.
ECoP 7: Top Soil Management		
Land clearing and earth works	Earthworks will impact the fertile top soils that are enriched with nutrients required for plant growth agricultural development.	The Contractor shall • Strip the top soil to a depth of 15 cm and store in stock piles of height not exceeding 2m. • Remove unwanted materials from top soil like grass, roots of trees and similar others. • The stockpiles will be done in slopes of 2:1 to reduce surface runoff and enhance percolation through the mass of stored soil. • Locate topsoil stockpiles in areas outside drainage lines and protect from erosion. • Construct diversion channels and silt fences around the topsoil stockpiles to prevent erosion and loss of topsoil. • Spread the topsoil to maintain the physico-chemical and biological activity of the soil. The stored top soil will be utilized for covering all disturbed area and along the proposed plantation sites • Prior to the re-spreading of topsoil, the ground surface will be ripped to assist the bunding of the soil layers, water penetration and re vegetation
Transport	Vehicular movement outside ROW or temporary access roads will affect the soil fertility of the agricultural lands	• Limit equipment and vehicular movements to within the approved construction zone • Construct temporary access tracks to cross concentrated water flow lines at right angles • Plan construction access to make use, if possible, of the final road alignment • Use vehicle-cleaning devices, for example, ramps or wash down areas
ECoP 8: Topography and Landscaping		
Land clearing and earth works	Flood plains of the existing Project area will be affected by the construction of various project activities. Construction activities especially earthworks will change topography and disturb the natural rainwater/flood water drainage as well as will change the local landscape.	The Contractor shall • Ensure the topography of the final surface of all raised lands (construction yards, approach roads, access roads, bridge end facilities, etc.) are conducive to enhance natural draining of rainwater/flood water; • Keep the final or finished surface of all the raised lands free from any kind of depression that insists water logging • Undertake mitigation measures for erosion control/prevention by grass-turfing and tree plantation, where there is a possibility of rain-cut that will change the shape of topography. • Cover immediately the uncovered open surface that has no use of construction activities with grass-cover

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		and tree plantation to prevent soil erosion and bring improved landscaping
ECoP 9: Borrow Areas Management		
Development and operation of borrow areas	Borrow areas will have impacts on local topography, landscaping and natural drainage	The Contractor shall • Use only approved quarry and borrow sites • Identify new borrow and quarry areas in consultation with Project Director, if required. • Reuse excavated or disposed material available in the project to the maximum extent possible. • Store top soil for reinstatement and landscaping. • Develop surface water collection and drainage systems, anti-erosion measures (berms, re vegetation etc.) and retaining walls and gabions where required. Implement mitigation measures in ECoP 3: Water Resources Management, ECoP 6: Erosion and Sediment Control • The use of explosive should be used in as much minimum quantity as possible to reduce noise, vibration and dust. • Control dust and air quality deterioration by application of watering and implementing mitigation measures proposed in ECoP 10: Air Quality Management. • Noise and vibration control by ECoP 11: Noise and Vibration Management
ECoP 10: Air Quality Management		
Construction vehicular traffic	Air quality can be adversely affected by vehicle exhaust emissions and combustion of fuels.	The Contractor shall • Fit vehicles with appropriate exhaust systems and emission control devices. Maintain these devices in good working condition. • Operate the vehicles in a fuel efficient manner • Cover haul vehicles carrying dusty materials moving outside the construction site • Impose speed limits on all vehicle movement at the worksite to reduce dust emissions • Control the movement of construction traffic • Water construction materials prior to loading and transport • Service all vehicles regularly to minimize emissions • Limit the idling time of vehicles not more than 2 minutes
Construction machinery	Air quality can be adversely affected by emissions from machinery and combustion of fuels.	The Contractor shall • Fit machinery with appropriate exhaust systems and emission control devices. Maintain these devices in good working condition in accordance with the specifications defined by their manufacturers to maximize combustion efficiency and minimize the contaminant emissions. Proof or maintenance register shall be required by the equipment suppliers and contractors/subcontractors • Focus special attention on containing the emissions from generators • Machinery causing excess pollution (e.g. visible smoke) will be banned from construction sites • Service all equipment regularly to minimize emissions

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Provide filtering systems, duct collectors or humidification or other techniques (as applicable) to the concrete batching and mixing plant to control the particle emissions in all its stages, including unloading, collection aggregate handling, cement dumping, circulation of trucks and machinery inside the installations
Construction activities	Dust generation from construction sites, material stockpiles and access roads is a nuisance in the environment and can be a health hazard	• Water the material stockpiles, access roads and bare soils on an as required basis to minimize the potential for environmental nuisance due to dust. Increase the watering frequency during periods of high risk (e.g. high winds). Stored materials such as gravel and sand shall be covered and confined to avoid their being wind-drifted • Minimize the extent and period of exposure of the bare surfaces • Reschedule earthwork activities or vegetation clearing activities, where practical, if necessary to avoid during periods of high wind and if visible dust is blowing off-site • Restore disturbed areas as soon as practicable by vegetation/grass-turfing • Store the cement in silos and minimize the emissions from silos by equipping them with filters. • Establish adequate locations for storage, mixing and loading of construction materials, in a way that dust dispersion is prevented because of such operations • Crushing of rocky and aggregate materials shall be wet-crushed, or performed with particle emission control systems
ECoP 11: Noise and Vibration Management		
Construction vehicular traffic	Noise quality will be deteriorated due to vehicular traffic	The Contractor shall • Maintain all vehicles in order to keep it in good working order in accordance with manufactures maintenance procedures • Make sure all drivers will comply with the traffic codes concerning maximum speed limit, driving hours, etc. • Organize the loading and unloading of trucks, and handling operations for the purpose of minimizing construction noise on the work site
Construction machinery	Noise and vibration may have an impact on people, property, fauna, livestock and the natural environment.	The Contractor shall • Appropriately site all noise generating activities to avoid noise pollution to local residents • Use the quietest available plant and equipment • Modify equipment to reduce noise (for example, noise control kits, lining of truck trays or pipelines) • Maintain all equipment in order to keep it in good working order in accordance with manufactures maintenance procedures. Equipment suppliers and contractors shall present proof of maintenance register of their equipment. • Install acoustic enclosures around generators to reduce noise levels. • Fit high efficiency mufflers to appropriate construction equipment • Avoid the unnecessary use of alarms, horns and sirens

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction activity	Noise and vibration may have an impact on people, property, fauna, livestock and the natural environment	The Contractor shall • Notify adjacent landholders prior any typical noise events outside of daylight hours • Educate the operators of construction equipment on potential noise problems and the techniques to minimize noise emissions • Employ best available work practices on-site to minimize occupational noise levels • Install temporary noise control barriers where appropriate • Notify affected people if major noisy activities will be undertaken, e.g. pile driving • Plan activities on site and deliveries to and from site to minimize impact • Monitor and analyze noise and vibration results and adjust construction practices as required. • Avoid undertaking the noisiest activities, where possible, when working at night near the residential areas
ECoP 12: Protection of Flora		
Vegetation clearance	Local flora are important to provide shelters for the birds, offer fruits and/or timber/fire wood, protect soil erosion and overall keep the environment very friendly to human-living. As such damage to flora has wide range of adverse environmental impacts.	The Contractor shall • Reduce disturbance to surrounding vegetation • Use appropriate type and minimum size of machine to avoid disturbance to adjacent vegetation. • Get approval from supervision consultant for clearance of vegetation. • Make selective and careful pruning of trees where possible to reduce need of tree removal. • Control noxious weeds by disposing of at designated dump site or burn on site. • Clear only the vegetation that needs to be cleared in accordance with the plans. These measures are applicable to both the • construction areas as well as to any associated activities such as sites for stockpiles, disposal of fill and construction of diversion roads, etc. • Do not burn off cleared vegetation – where feasible, chip or mulch and reuse it for the rehabilitation of affected areas, temporary access tracks or landscaping. Mulch provides a seed source, can limit embankment erosion, retains soil moisture and nutrients, and encourages re-growth and protection from weeds. • Return topsoil and mulched vegetation (in areas of native vegetation) to approximately the same area of the roadside it came from. • Avoid work within the drip-line of trees to prevent damage to the tree roots and compacting the soil. • Minimize the length of time the ground is exposed or excavation left open by clearing and re-vegetate the area at the earliest practically possible. • Ensure excavation works occur progressively and re-vegetation done at the earliest • Provide adequate knowledge to the workers regarding nature protection and the need of avoid felling trees during construction • Supply appropriate fuel in the work caps to prevent fuel wood collection

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
ECoP 13: Protection of Fauna		
Construction activities	The location of construction activities can result in the loss of wild life habitat and habitat quality,.	The Contractor shall • Limit the construction works within the designated sites allocated to the contractor • check the site for animals trapped in, or in danger from site works and use a qualified person to relocate the animal
	Impact on migratory birds, its habitat and its active nests	The Contractor shall • Not be permitted to destruct active nests or eggs of migratory birds • Minimize the tree removal during the bird breeding season. If works must be continued during the bird breeding season, a nest survey will be conducted by a qualified biologist prior to commence of works to identify and located active nests • Minimize the release of oil, oil wastes or any other substances harmful to migratory birds to any waters or any areas frequented by migratory birds.
Vegetation clearance	Clearance of vegetation may impact shelter, feeding and/or breeding and/or physical destruction and severing of habitat areas	The Contractor shall • Restrict the tree removal to the minimum required. • Retain tree hollows on site, or relocate hollows, where appropriate • Leave dead trees where possible as habitat for fauna • Fell the hollow bearing trees in a manner which reduces the potential for fauna mortality. Felled trees will be inspected after felling for fauna and if identified and readily accessible will be removed and relocated or rendered assistance if injured. After felling, hollow bearing trees will remain unmoved overnight to allow animals to move of their own volition
Construction camps	Illegal poaching	• Provide adequate knowledge to the workers regarding protection of flora and fauna, and relevant government regulations and punishments for illegal poaching
Construction activities in River	The main potential impacts to fisheries are hydrocarbon spills and leaks from riverine transport and disposal of wastes into the river	The Contractor shall • Ensure the riverine transports, vessels and ships are well maintained and do not have oil leakage to contaminate river water. • Contain oil immediately on river in case of accidental spillage from vessels and ships and in this regard, make an emergency oil spill containment plan to be supported with enough equipment, materials and human resources • Do not dump wastes, be it hazardous or non-hazardous into the nearby water bodies or in the river
Construction activities on the land	The main potential impacts to aquatic flora and fauna River are increased suspended solids from earthworks erosion, sanitary discharge from work camps, and hydrocarbon spills	The Contractor shall • follow mitigation measures proposed in ECoP 3 : Water Resources Management and EC4: Drainage Management
	Filling of ponds for site preparation will impact the fishes.	The Contractor shall • Inspect any area of a water body containing fish that is temporarily isolated for the presence of fish, and all fish shall be captured and released unharmed in adjacent fish habitat

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Install and maintain fish screens etc. on any water intake with drawing water from any water body that contain fish
ECoP 14: Protection of Fisheries		
Construction activities in River	The main potential impacts to fisheries are hydrocarbon spills and leaks from riverine transport and disposal of wastes into the river	The Contractor shall • Ensure the riverine transports (if any) are well maintained and do not have oil leakage to contaminate river water. • Contain oil immediately on river in case of accidental spillage from vessels and ships and in this regard, make an emergency oil spill containment plan to be supported with enough equipment, materials and human resources • Do not dump wastes, be it hazardous or non-hazardous into the nearby water bodies or in the river
Construction activities on the land	The main potential impacts to aquatic flora and fauna River are increased suspended solids from earthworks erosion, sanitary discharge from work camps, and hydrocarbon spills	The Contractor shall • follow mitigation measures proposed in ECoP 3 : Water Resources Management and EC4: Drainage Management
	Filling of ponds for site preparation will impact the fishes.	The Contractor shall • Inspect any area of a water body containing fish that is temporarily isolated for the presence of fish, and all fish shall be captured and released unharmed in adjacent fish habitat • Install and maintain fish screens etc. on any water intake with drawing water from any water body that contain fish
ECoP 15: Road Transport and Road Traffic Management		
Construction vehicular traffic	Accidents and spillage of fuels and chemicals	The Contractor shall • Prepare and submit a traffic management plan to the Construction Contractor for his approval at least 30 days before commencing work on any project component involved in traffic diversion and management. • Include in the traffic management plan to ensure uninterrupted traffic movement during construction: detailed drawings of traffic arrangements showing all detours, temporary road, temporary bridges temporary diversions, necessary barricades, warning signs / lights, and road signs. • Provide signs at strategic locations of the roads complying with the schedules of signs contained in the Traffic Regulations. • Install and maintain a display board at each important road intersection on the roads to be used during construction, which shall clearly show the following information in Assam: • Duration of construction period • Period of proposed detour / alternative route

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Suggested detour route map • Name and contact address/telephone number of the concerned personnel • Name and contact address / telephone number of the Contractor • Inconvenience is sincerely regretted. • Restrict truck deliveries, where practicable, to day time working hours. • Restrict the transport of oversize loads. • Operate road traffics/transport vehicles, if possible, to non-peak periods to minimize traffic disruptions. • Enforce on-site speed limit
ECoP 16: River Transport management		
Construction activities in River	The presence of construction and dredging barges, pipe lines and other construction activities in the river can cause hindrance and risks to the river traffic.	The Contractor shall • Not obstruct other normal riverine transport while doing riverine transport and works • Identify the channel to be followed clearly using navigation aids such as buoys, beacons, and lighting • Provide proper buoyage, navigation lights and markings for bridge and dredging works to guide the other normal riverine transport • Keep regular and close contacts with Flood & River Erosion Management Agency of Assam (FREMAA) regarding their needs during construction of the project • Plan the river transport and transportation of large loads in coordination with FREMAA to avoid traffic congestions. • Provide signage for river traffic conforming to the FREMAA requirements • Position the dredge and pipeline in such a way that no disruption to the channel traffic will occur
	Accidents	The Contractor shall • Prepare an emergency plan for dealing with accidents causing accidental sinking of the vessels and ships • Ensure sufficient equipment and staffs available to execute the emergency plans • Provide appropriate lighting to barges and construction vessels
ECoP 17: Construction Camp Management		
Siting and Location of construction camps	Campsites for construction workers are the important locations that have significant impacts such as health and safety hazards on	The Contractor shall • Locate the construction camps at areas which are acceptable from environmental, cultural or social point of view. • Consider the location of construction camps away from communities in order to avoid social conflict in using the natural resources such as water or to avoid the possible adverse impacts of the construction camps on the surrounding communities. • Submit to the Construction Contractor for approval a detailed layout plan for the development of the construction camp showing the relative locations of all temporary buildings and facilities that are to be constructed together with the location of site roads, fuel storage areas (for use in power supply generators), solid waste management and dumping locations, and drainage facilities, prior to the development of the construction camps.

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Local authorities responsible for health, religious and security shall be duly informed on the set up of camp facilities so as to maintain effective surveillance over public health, social and security matters.
Construction Camp Facilities	Lack of proper infrastructure facilities, such as housing, water supply and sanitation facilities will increase pressure on the local services and generate substandard living standards and health hazards.	Contractor shall provide the following facilities in the campsites • Adequate housing for all workers • Safe and reliable water supply. Water supply from deep tube wells of 300 m depth that meets the national standards • Hygienic sanitary facilities and sewerage system. The toilets and domestic waste water will be collected through a common sewerage. Provide separate latrines and bathing places for males and females with total isolation by wall or by location. The minimum number of toilet facilities required is one toilet for every ten persons • Treatment facilities for sewerage of toilet and domestic wastes • Storm water drainage facilities Both sides of roads are to be provided with shallow v drains to drain off storm water to a silt retention pond which shall be sized to provide a minimum of 20 minutes retention of storm water flow from the whole site. Channel all discharge from the silt retention pond to natural drainage via a grassed swale at least 20 meters in length with suitable longitudinal gradient. • Paved internal roads. Ensure with grass/vegetation coverage to be made of the use of top soil that there is no dust generation from the loose/exposed sandy surface. Pave the internal roads of at least haring-bond bricks to suppress dusts and to work against possible muddy surface during monsoon. • Provide child crèches for women working construction site. The crèche shall have facilities for dormitory, kitchen, indoor and outdoor play area. Schools shall be attached to these crèches so that children are not deprived of education whose mothers are construction workers • Provide in-house community/common entertainment facilities. dependence of local entertainment outlets by the construction camps to be discouraged/prohibited to the extent possible
Disposal of waste	Management of wastes is crucial to minimize impacts on the environment	The Contractor shall • Ensure proper collection and disposal of solid wastes within the construction camps • Insist waste separation by source; organic wastes in one pot and inorganic wastes in another pot at household level. • Store inorganic wastes in a safe place within the household and clear organic wastes on daily basis to waste collector. Establish waste collection, transportation and disposal systems with the manpower and equipment/vehicles needed. • Dispose organic wastes in a designated safe place on daily basis. At the end of the day cover the organic wastes with a thin layer of sand so that flies, mosquitoes, dogs, cats, rats, are not attracted. One may dig a large hole to put organic wastes in it; take

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		care to protect groundwater from contamination by leachate formed due to decomposition of wastes. Cover the bed of the pit with impervious layer of materials (clayey or thin concrete) to protect groundwater from contamination. • Locate the garbage pit/waste disposal site min 500 m away from the residence so that peoples are not disturbed with the odor likely to be produced from anaerobic decomposition of wastes at the waste dumping places. Encompass the waste dumping place by fencing and tree plantation to prevent children to enter and play with. • Do not establish site specific landfill sites. All solid waste will be collected and removed from the work camps and disposed in approval waste disposal sites
Fuel supplies for cooking purposes	Illegal sourcing of fuel wood by construction workers will impact the natural flora and fauna	The Contractor shall • Provide fuel to the construction camps for their domestic purpose, in order to discourage them to use fuel wood or other biomass. • Made available alternative fuels like natural gas or kerosene on ration to the workforce to prevent them using biomass for cooking. • Conduct awareness campaigns to educate workers on preserving the protecting the biodiversity and wildlife of the project area, and relevant government regulations and punishments on wildlife protection
Health and Hygiene	There will be a potential for diseases to be transmitted including malaria, exacerbated by inadequate health and safety practices. There will be an increased risk of work crews spreading sexually transmitted infections and HIV/AIDS	The Contractor shall • Provide adequate health care facilities within construction sites. • Provide first aid facility round the clock. Maintain stock of medicines in the facility and appoint fulltime designated first aider or nurse. • Provide ambulance facility for the laborers during emergency to be transported to nearest hospitals. • Initial health screening of the laborers coming from outside areas • Train all construction workers in basic sanitation and health care issues and safety matters, and on the specific hazards of their work Provide HIV awareness programming, including STI (sexually transmitted infections) and HIV information, education and communication for all workers on regular basis • Complement educational interventions with easy access to condoms at campsites as well as voluntary counseling and testing • Provide adequate drainage facilities throughout the camps to ensure that disease vectors such as stagnant water bodies and puddles do not form. Regular mosquito repellant sprays during monsoon. • Carryout short training sessions on best hygiene practices to be mandatorily participated by all workers. Place display boards at strategic locations within the camps containing messages on best hygienic practices
Safety	In adequate safety facilities to the construction camps may create security problems and fire hazards	The Contractor shall • Provide appropriate security personnel (police / home guard or private security guards) and enclosures to prevent unauthorized entry in to the camp area.

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Maintain register to keep a track on a head count of persons present in the camp at any given time. • Encourage use of flameproof material for the construction of labor housing / site office. Also, ensure that these houses/rooms are of sound construction and capable of withstanding wind storms/cyclones. • Provide appropriate type of firefighting equipment suitable for the construction camps • Display emergency contact numbers clearly and prominently at strategic places in camps. • Communicate the roles and responsibilities of laborers in case of emergency in the monthly meetings with contractors
Site Restoration	Restoration of the construction camps to original condition requires demolition of construction camps.	• The Contractor shall • Dismantle and remove from the site all facilities established within the construction camp including the perimeter fence and lockable gates at the completion of the construction work. • Dismantle camps in phases and as the work gets decreased and not wait for the entire work to be completed • Give prior notice to the laborers before demolishing their camps/units • Maintain the noise levels within the national standards during demolition activities • Different contractors shall be hired to demolish different structures to promote recycling or reuse of demolished material. • Reuse the demolition debris to a maximum extent. Dispose remaining debris at the designated waste disposal site. • Handover the construction camps with all built facilities as it is if agreement between both parties (contactor and land-owner) has been made so. • Restore the site to its condition prior to commencement of the works or to an agreed condition with the landowner.
ECoP 18: Cultural and Religious Issues		
Construction activities near religious and cultural sites	Disturbance from construction works to the cultural and religious sites, and contractors lack of knowledge on cultural issues cause social disturbances	The Contractor shall • Communicate to the public through community consultation and newspaper announcements regarding the scope and schedule of construction, as well as certain construction activities causing disruptions or access restriction. • Do not block access to cultural and religious sites, wherever possible • Restrict all construction activities within the foot prints of the construction sites. • Stop construction works that produce noise (particularly during prayer time) shall there be any mosque/religious/educational institutions close to the construction sites and users make objections. • Take special care and use appropriate equipment when working next to a cultural/religious institution. • Stop work immediately and notify the site manager if, during construction, an archaeological or burial site is discovered. It is an offence to recommence work in the vicinity of the site until approval to continue is

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		given by the Construction Contractor /PMU. Provide separate prayer facilities to the construction workers • Show appropriate behavior with all construction workers especially women and elderly people • Allow the workers to participate in praying during construction time • Resolve cultural issues in consultation with local leaders and supervision consultants • Establish a mechanism that allows local people to raise grievances arising from the construction process. • Inform the local authorities responsible for health, religious and security duly informed before commencement of civil works so as to maintain effective surveillance over public health, social and security matters
ECoP 19: Worker Health and Safety		
Best practices	Construction works may pose health and safety risks to the construction workers and site visitors leading to severe injuries and deaths. The population in the proximity of the construction site and the construction workers will be exposed to a number of (i) biophysical health risk factors, (e.g. noise, dust, chemicals, construction material, solid waste, waste water, vector transmitted diseases etc), (ii) risk factors resulting from human behavior (e.g. STD, HIV etc) and (iii) road accidents from construction traffic.	The Contractor shall • implement suitable safety standards for all workers and site visitors which shall not be less than those laid down on the international standards (e.g. National / International Labor for 'Safety and Health in Construction; World Bank Group's 'Environmental Health and Safety Guidelines') and contractor's own national standards or statutory regulations, in addition to complying with the state & national standards of the Government of Assam and Government of India • Provide the workers with a safe and healthy work environment, taking into account inherent risks in its particular construction activity and specific classes of hazards in the work areas, • Provide personal protection equipment (PPE) for workers, such as safety boots, helmets, masks, gloves, protective clothing, goggles, full-face eye shields, and ear protection. Maintain the PPE properly by cleaning dirty ones and replacing them with the damaged ones. • Safety procedures include provision of information, training and protective clothing to workers involved in hazardous operations and proper performance of their job • Appoint an environment, health and safety manager to look after the health and safety of the workers • Inform the local authorities responsible for health, religious and security duly informed before commencement of civil works and establishment of construction camps so as to maintain effective surveillance over public health, social and security Matters
	Child and pregnant labor	The Contractor shall • not hire children of less than 14 years of age and pregnant women or women who delivered a child within 8 preceding weeks, in accordance with the national guidelines

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Accidents	Lack of first aid facilities and health care facilities in the immediate vicinity will aggravate the health conditions of the victims	• Provide health care facilities and first aid facilities are readily available. Appropriately equipped first-aid stations shall be easily accessible throughout the place of work Document and report occupational accidents, diseases, and incidents. • Prevent accidents, injury, and disease arising from, associated with, or occurring in the course of work by minimizing, so far as reasonably practicable, the causes of hazards. In a manner consistent with good international industry practice. • Identify potential hazards to workers, particularly those that may be life-threatening and provide necessary preventive and protective measures. • Provide awareness to the construction drivers to strictly follow the driving rules • Provide adequate lighting in the construction area and along the roads
Construction Camps	Lack of proper infrastructure facilities, such as housing, water supply and sanitation facilities will increase pressure on the local services and generate substandard living standards and health	The Contractor shall provide the following facilities in the campsites to improve health and hygienic conditions as mentioned in ECoP 17 Construction Camp Management • Arrangement for trainings • Adequate ventilation facilities • Safe and reliable water supply. Water supply from deep tube wells that meets the national standards • Hygienic sanitary facilities and sewerage system. The toilets and domestic waste water will be collected through a common sewerage. • Treatment facilities for sewerage of toilet and domestic wastes • Storm water drainage facilities. • Recreational and social facilities • Safe storage facilities for petroleum and other chemicals in accordance with ECoP 2 • Solid waste collection and disposal system in accordance with ECoP1. • Paved internal roads. • Security fence at least 2 m height. • Sick bay and first aid facilities
Water and sanitation facilities at the construction sites	Lack of Water sanitation facilities at construction sites cause inconvenience to the construction workers and affect their personal hygiene.	The contractor shall provide portable toilets at the construction sites, if about 25 people are working the whole day for a month. Location of portable facilities shall be at least 6 m away from storm drain system and surface waters. These portable toilets shall be cleaned once a day and all the sewerage shall be pumped from the collection tank once a day and shall be brought to the common septic tank for further treatment. Contractor shall provide bottled drinking water facilities to the construction workers at all the construction sites.
Other ECoPs	Potential risks on health and hygiene of construction workers and general public	The Contractor shall follow the following ECoPs to reduce health risks to the construction workers and nearby community • ECoP 2: Fuels and Hazardous Goods Management • ECoP 4: Drainage Management • ECoP 10: Air Quality Management • ECoP 11: Noise and Vibration Management • ECoP15: Road Transport and Road Traffic Management • ECoP 16: River Transport management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Trainings	Lack of awareness and basic knowledge in health care among the construction workforce, make them susceptible to potential diseases.	The Contractor shall • Train all construction workers in basic sanitation and health care issues (e.g., how to avoid malaria and transmission of sexually transmitted infections (STI) HIV/AIDS. • Train all construction workers in general health and safety matters, and on the specific hazards of their work Training shall consist of basic hazard awareness, site specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate. • Commence the malaria, HIV / AIDS and STI education campaign before the start of the construction phase and complement it with by a strong condom marketing, increased access to condoms in the area as well as to voluntary counseling and testing. • Implement malaria, HIV/AIDS and STI education campaign targeting all workers hired, international and national, female and male, skilled, semi- and unskilled occupations, at the time of recruitment and thereafter pursued throughout the construction phase on ongoing and regular basis. This shall be complemented by easy access to condoms at the workplace as well as to voluntary counseling and testing.
ECoP 20: Dredging Management		
Locations of dredging	Impact on habitats of sensitive species such dolphin and migratory birds, and fish habitats	The Contractor shall • Avoid sensitive areas (dolphin and bird habitats, fish spawning areas and char lands) identified in the EIA. No dredging will be carried out within one kilometer from these sensitive areas. • Obtain approval from Construction Contractor (construction supervision consultant) before starting dredging from any location
Preconstruction studies .	Quality of river bed sediments are to be established to identify potential impacts associated with dredging and placement. Proposed dredging locations are to be studied for their ecological sensitivity	FREMAA and Construction Contractor • Will evaluate the river bed materials for their physical, chemical, biological, and engineering properties prior to initiation of dredging activities. Sediment quality studies for nutrients and pollutants are particularly important to monitor the impacts of dredging • Carry out survey of the area prior to dredging • Identify any sensitive receptors/habitats (e.g., dolphin area / turtle nesting area, birds colony) at or near the proposed dredging locations. • Determine ‘no-go’ areas for dredging, based upon the above survey, • Monitor the activity to ensure that the contractor complies with requirements • Survey the area after dredging to identify any leftover impacts

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Dredging - Excavation	Increased turbidity, loss of transparency and increased suspended sediment concentrations. Impact on benthic habitats.	The Contractor shall • Select dredging equipment (e.g. Cutter Suction Dredger) which are known to have a low risk of sediment dispersal. The suction action inside the Cutter Suction Dredger means that most of the sediment removed by the cutter is captured. As high dredging efficiency and low turbidity at the cutter head are closely linked, it is uncommon for turbidity generated by the cutter head to cause environmental concern. • Monitor the dredging operation and, if necessary, change the dredge location to minimize fines or modify operations, e.g. restrict the amount of material being dredged (or the number of dredgers allowed to operate) at any one time. • Maintain record of all sand or sediment extraction (quantities, location shown on map, timing)
Dredging: Lifting	The release of suspended sediments during lifting can cause mortality to fish. The re-suspension of sediments can also release toxic chemicals or nutrients such as phosphates and nitrates, which may increase the eutrophic status of the system. Release of anaerobic sediment and organic matter in high concentrations may in some cases deplete the dissolved oxygen	The Contractor shall • Select dredging equipment (e.g. Cutter Suction Dredger) which are known to have a low risk of sediment releases from lifting. • Reduce the suspended material released into the water column by adjusting the ratio of cutter revolutions to pump velocity to ensure that the cutter advancement rate is not greater than the ability of the suction pump to remove the material • Monitor the lifting operations and if required use techniques (e.g. silt curtains) to minimize adverse impacts on aquatic life from the re suspension of sediments
Dredging: Transportation	Leakages and spillage from the hydraulic pipeline	The Contractor shall • Regularly inspect and maintain equipment in order to prevent leaks. • Develop and implement a spill prevention plan to prevent and contain accidental spills
Dredging: Placement	Dispersion of sediments and release of high sediment laden runoff from the placement sites.	The Contractor • Shall directly place the sediments for filling the proposed disposal areas. Prior to filling commencing, the areas being filled will be subdivided into compartments by construction of temporary containment bunds of suitable material (e.g. dredged sand). Filling will be achieved by progressively pumping a slurry of sand and water into the bunded areas, allowing the surplus water to drain away to artificial and natural waterways in a controlled manner through the pipeline, without affecting floodplains. • Control the discharge of site runoff, including excess dredge water, by the installation and correct use of containment walls, bunds and weirs. • Monitor the quality of water (e.g. sediment content) in site runoff to confirm that the design and operation of the bunds and weirs, and the retention time for dredge waters which facilitates the settlement out of fine sediments prior to discharge off site, is adequate. If required, additional siltation ponds are to be

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		provided to divert the runoff water before discharging in to the river.
Noise from dredging activities	Noise and vibration under water: Disruption to fish migration and disturbance to dolphins Noise and vibration above water: Nuisance to local community, disturbance to birds	The Contractor shall • Reduce the dredger noise at source by isolation of exhaust systems, by keeping engine room doors shut and by additional measures such as shielding. • Limit the noisy dredging to daylight hours, where possible, rather than at sunrise or sunset (significant for wildlife) or during night time hours. Where unavoidable, the contractor should ramp up the levels of engines or other noise producing sources, so that the noise slowly increases. This will encourage riverine and terrestrial fauna to move away from the source area prior to significant noise emissions • Inspect and maintain equipment in good working condition
Exhaust emissions	Air pollution and release of greenhouse gases from construction equipment	The Contractor shall • Inspect and maintain equipment in good working condition. Proper maintenance of engines ensures full combustion with low soot emissions. • Select and operate equipment and manage operations to reduce engine emissions. • Use low-Sulphur heavy fuels to reduce noxious emissions. • Provide Exhaust filtering.
Oil spills	Oil spills	The Contractor shall • Refuel of vehicles with a proper care to avoid any spills. • Make available spill kits and other absorbent material at refueling points on the barges

Construction Waste & Debris Management Plan

1. Introduction

Waste will be generated from the construction site and labour camps during the construction phase. Type of the waste to be generated during construction phase is given below.

2. Excavated Soil

Site is undulating and thus will require cut & fill for levelling. Finished level of the soil will be 37m. Top excavated soil of 15 cm shall be stripped and shall be stored separately under coveredsheds. This soil shall be used for green belt plantation.Lower layers of excavated soil shall be re-used within the site for filling purpose, constructionofapproach & internal roads & railway link. If any extra soil is remained, then that should bedisposed of to the approved debris disposal site

3. Construction Waste

Construction waste will comprise of broken bricks, dry cement, discarded timber, metal piece,cement bag, dry asphalt/bitumen, glass, paint/varnishes box etc. These wastes should besegregated into recyclable and non-recyclable waste. Recyclable waste shall be stored in thecovered area and shall be sold to authorized vendors regularly. Non-recyclable waste shall bedisposed at approved debris site in covered vehicles.

4. Municipal Waste

Municipal waste will be generated from labour camp. Dustbins for recyclable and no recyclable waste shall be provided in labour camp area. Recyclable waste shall be sold toauthorized vendors and non-recyclable shall be disposed through authorized agency in area responsible for waste collection and management.Waste generated requires proper management so as to minimize the negative impacts onenvironment. Concept of reduce, re- use and recycle shall be followed at site. The rejectedwaste should be disposed in a secured manner. Thus a site should be identified for disposal ofthe rejected waste.

5. Dredged Material

Dredging shall be carried out in the river for construction of off-shore structures like jetty & berths (pilling) and navigation channels. Dredged soil shall not be disposed along the river bankas they are sensitive habitat for various aquatic species and provide as the spawning andbreeding grounds also. Dredged material shall be tested for its quality. If non-toxic then shouldbe disposed at disposal site but if toxic & contains heavy metals, then it should be disposed toTSDF site.

5.1Selection of Disposal Sites:

The locations of Disposal sites have to be selected such that: Disposal sites are located at least 1000 m away from sensitive locations like settlements, water body, notified forest areas, wildlife/bird/dolphin sanctuaries or any other sensitive locations.Disposal sites shall not contaminate any water sources, rivers etc so the site should belocated away from water body and disposal site should be lined properly to prevent infiltration of water.

Public perception about the location of debris disposal site has to be obtained before finalizing the location.Permission from the village/local community is to be obtained for the Disposal site selected.Environment Engineer of PMU and Authorized officials of Contract Management Unit must approve the Plan before commencement of work.

Contaminated sediment (a permanent disposal site is required) disposal aspects;

- No sensitive areas
- Government owned land (encumbrance free)

- Private land (non-agricultural)
- Details of the safeguard measures of the contaminated sediment disposal is included in the Environment Management Plan (EMP)

5.2 Principles for lease agreement

The Project Management Unit of the FREMAA will arrange land for disposal of the dredged materials following GOA law i.e. Acquisition. The land will be requisitioned through the concerned district administration of the project districts. The PMU will pay the required amount to DC office as per law as required for renting/leasing for the particular land for the sand deposition. DC office will annually assess the rent for the land and claim fund from the PMU to disburse to thelessees.

A lease agreement would be signed between the PMU and the land owners according to the broad principles as under-

1. DC will identify the actual owners of the proposed land taking into account of the recordof rights to the property
2. Rent would be paid through the DC office on yearly basis at the beginning of the year
3. Land will be used for project purposes only (sand deposition)
4. Land will be restored to original condition and returned to the land owners after agreed lease period.The lease agreement will be based on requisition of land

5.2 Precautions to be adopted during Disposal of Debris / WasteMaterial

The Contractor shall take the following precautions while disposing off the waste material. During the site clearance and disposal of debris, the Contractor will take full care to ensure that public or private properties are not affected, there is no dwellings around the dumpsite and that the traffic is not interrupted.
The Contractor will dispose debris only to the identified places or at other places onlywith prior permission of Engineer-in-Charge of works.In the event of any spoil or debris from the sites being deposited on any adjacent land,the Contractor will immediately remove all such spoil debris and restore the affectedarea to its original state to the satisfaction of the Engineer-in-Charge of works.The Contractor will at all times ensure that the entire existing canal and drains withinand adjacent to the site are kept safe and free from any debris. Contractor will utilize effective water sprays during the delivery and handling of materials when dust is likely to be created and to dampen stored materials during dry and windy weather.

Materials having the potential to produce dust will not the loaded to a level higher than the side and tail boards and will be covered with a tarpaulin in good condition. Any diversion required for traffic during disposal of debris shall be provided with traffic control signals and barriers after the discussion with local people and with the permission of Engineer-in-Charge of works.

During the debris disposal, Contractor will take care of surrounding features and avoid any damage to it. The debris should not be disposed along the bridges & culverts and near the water bodies.While disposing debris / waste material, the Contractor will take into account the winddirection and location of settlements to ensure against any dust problems. Contractor should display the board at disposal site stating the name of project, usage of the site and type of debris being disposed.A guard shall be kept at disposal site to prevent any unauthorized disposal of waste atthe debris disposal siteMaterial should be disposed through covered vehicles onlyNo contaminated/hazardous/e-waste shall be disposed at the debris disposal site

5.3 Record Keeping

Site approved by site engineer only can be used as disposal site. Record of all such site shouldbe maintained along with the area of disposal site, type & quantity of material disposed dailyand capacity of disposal site.

5.4 Guidelines for Rehabilitation of Disposal Sites

The dumpsites filled only up to the ground level could be rehabilitated as per guidelines belowand to be decided by the Engineer and the supervision consultant.
The dumpsites have to be suitably rehabilitated by planting local species of shrubs and other plants. Local species of trees has also to be planted so that the landscape is coherent and is in harmony with its various components.
In cases where a dumpsite is near to the local village community settlements, it could be converted into a play field by spreading the dump material evenly on the ground. Such playground could be made coherent with the landscape by planting trees all along the periphery of the playground.Closure of the disposal site should be upto the satisfactory level of site engineer

5.5 Penalties

Stringent action & penalties should be imposed off on contractor for dumping of materials in locations other than the pre-identified locations. Grievance Readressal mechanism should be inplace for taking note and action on such complaints.

Along with the Construction and Labour Camp management Plan ECoPs shall be followed by the Contractor.

Borrow Area Management Plan

1.0 Introduction

Borrow areas will be finalized as identified by Contractor as agreed by the PMC and FREMAA as perthe requirements of the contract. Environment clearance under EIA Notification, 2006 from competent authority and NOC from state pollution control board under Air Act, 1981 as applicable shall be obtained by contractor prior excavation. Consent from land owners and DC of the area shall also be taken prior undertaking any excavation.

The Contractor in addition to the established practices, rules and regulation will also consider following criteria before finalizing the locations. Contractor should submit borrow area establishment plan along with the locations marked in map and the environmental settings of the planned area to PMC/FREMAA for approval of the “Engineer” through RFI.

- The borrow area should not be located in agriculture field unless unavoidable i.e. barrenland is not available.
- The borrow pits should not be located along the roads, close to project site
- The loss of productive and agricultural land should be minimum.
- The loss of vegetation is almost nil or minimum.
- Sufficient quality of soil is available.
- The Contractor will ensure the availability of suitable earth.

The Contractor shall obtain representative samples from each of the identified borrow areas and have these tested at the site laboratory following a testing programme as approved by the concerned Engineer. It shall be ensured that the fill material compacted to the required density.The Contractor shall submit the following information to the Engineer for approval at least 7working days before commencement of compaction.

- The values of maximum dry density and optimum moisture content obtained in accordance with ARE: 2720 (Part 7) or (Part 8), as the case may be, appropriate for each of the fill materials he intends to use.
- A graph of density plotted against content from which, each of the values in (1) above ofmaximum dry density and optimum moisture content are determined.

After identification of borrow areas based on guidelines and full filling the following requirementsare to be fulfilled

- Quantification of Earth
- Land Agreement
- Clearance from local authorities

After receiving the approval Contractor will begin operations keeping in mind following:

- Haulage of material to the areas of fill shall proceed only when sufficient spreading and compaction plants are operating at the place of deposition.
- No excavated acceptable material other than surplus to requirements of the Contract shallbe removed from the site. Contractor should be permitted to remove acceptablematerialfrom the site to suit his operational procedure, then be shall make good any consequentdeficit of material arising there from.
- Where the excavation reveals a combination of acceptable and un-acceptable materials,the Contractor shall, unless otherwise agreed by the Engineer, carryout the excavation in such a manner that the acceptable materials are excavated separately for use in the permanent works without contamination by the un- acceptable materials. The acceptable material shall be stockpiled separately.
- The Contractor shall ensure that he does not adversely affect the stability of excavation or fills by the methods of stockpiling materials, use of plants or siting of temporary buildings or structures.

1.1 Borrow Area Management

Borrow areas located in different land will require different management. Management measures to be taken in different land types are given below.

1.1.1 Borrow Areas located in Agricultural Lands

- The preservation of topsoil will be carried out in stockpile.
- A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2(Vertical: Horizontal).
- Borrowing of earth will be carried out up to a depth of 1.5m from the existing ground level.
- Borrowing of earth will not be done continuously throughout the stretch.
- Ridges of not less than 8m widths will be left at intervals not exceeding 300m.
- Small drains will be cut through the ridges, if necessary, to facilitate drainage.
- The slope of the edges will be maintained not steeper then 1:4 (Vertical: Horizontal).

1.1.2 Borrow Areas located in Agriculture Land in un-avoidable Circumstances:

- The preservation of topsoil will be carried out in stockpile.
- A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2(Vertical: Horizontal).
- The depth of borrow pits will not be more than 30 cm after stripping the 15 cm topsoil aside.

1.1.3 Borrow Areas located on Elevated Lands

- The preservation of topsoil will be carried out in stockpile
- A 15 cm topsoil will be stripped off from the borrow pit and this will be stored instockpilesin a designated area for height not exceeding 2m and side slopes not steeper than 1:2(Vertical: Horizontal).
- At location where private owners desire their fields to be levelled, the borrowing shall be done to a depth of not more than 1.5m or up to the level of surrounding fields.

1.1.4 Borrow Areas near Riverside

- The preservation of topsoil will be carried out in stockpile
- A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stock piles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2(Vertical: Horizontal).
- Borrow area near to any surface water body will be at least at a distance of 15m from the toe of the bank or high flood level, whichever is more.

1.1.5 Borrow Areas near Settlements

- The preservation of topsoil will be carried out in stockpile
- A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2(Vertical: Horizontal).
- Borrow pit location will be located at least 0.75 km from villages and settlements. If unavoidable, the pit will not be dug for more than 30 cm and drains will be cut to facilitate drainage.
- Borrow pits located in such location will be re-developed immediately after borrowing is completed. If spoils are dumped, that will be covered with layers of stockpiled topsoil in accordance with compliance requirements with respect MOEF&CC/CPCB guidelines.

1.1.6 Borrow Pits along the Roads

- The preservation of topsoil will be carried out in stockpile

- A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2(Vertical: Horizontal).
- Borrow pits along the road shall be discouraged.
- If permitted by the Engineer; these shall not be dug continuously.
- Ridges of not less than 8m widths should be left at intervals not exceeding 300m.
- Small drains shall be cut through the ridges of facilitate drainage.
- The depth of the pits shall be so regulated that its bottom does not cut an imaginary line having a slope of 1 vertical to 4 horizontal projected from the edge of the final section of bank, the maximum depth of any case being limited to 1.5m.
- Also, no pit shall be dug within the offset width from the toe of the embankment required as per the consideration of stability with a minimum width of 10m.
- Minimum distance from road/ railway should be 50 metres.

1.1.7 Re-development of Borrow Areas

The objective of the rehabilitation programme is to return the borrow pit sites to a safe and secure area, which the general public should be able to safely enter and enjoy. Securing borrow pits in a stable condition is fundamental requirement of the rehabilitation process. This could be achieved by filling the borrow pit approximately to the road level.
Re-development plan will be prepared by the Contractor before the start of work in line with the owner's will and to the satisfaction of owner.

The Borrow Areas will be rehabilitated as follows

- Borrow pits will be backfilled with rejected construction wastes (unserviceable materials) compacted and will be given a turfing or vegetative cover on the surface. If this is not possible, then excavation slope should be smoothened and depression is filled in such away that it looks more or less like the original ground surface.
- Borrow areas might be used for aquaculture in case landowner wants such development. In that case, such borrow area will be photographed after their post-use restoration and Environment Expert of Supervision Consultant will certify the post-use redevelopment.
- The Contractor will keep record of photographs of various stages i.e. before using materials form the location (pre-project), for the period borrowing activities (Construction Phase) and after rehabilitation (post development), to ascertain the pre and post borrowing status of the area.

Construction and Labour Camp Management Plan

1.0 Objective of the Plan

The objective of this plan is to provide guidance to the contractor or other agency involved in setting up of the construction and labour camp for keeping the health & Safety of workers and impacts of setting up such camps on the local community in consideration while developing and establishing such camp. This plan is prepared in reference to the Workers accommodation: processes and standards (A guidance note by IFC and EBRD). The plan aims to promote “safe and healthy working conditions, and to protect and promote the health of workers.”

2.0 Selection and layout of construction camp

Labour camps, plant sites and debris disposal site shall not be located close to habitations, schools, hospitals, religious places and other community places. A minimum distance of 500mshall be maintained from the habitations, sensitive locations like temple, school & hospitals, forest areas and other eco-sensitive zones for setting up such facilities.

3.0 Facilities at workers’ camps

During the construction stage of the project, the construction contractor will construct and maintain necessary (temporary) living accommodation, rest area and ancillary facilities for labour. Facilities required are listed and elaborated below. Site barricading Clean Water Facility Clean kitchen area with provision of clean fuel like LPG Clean Living Facilities for Workers Sanitation Facilities Waste Management Facilities Rest area for workers at construction site Adequate Illumination & ventilation Safe access road is required at camps Health Care Facilities Crèche Facility & Play School Fire-fighting Facility Emergency Response Area

3.1 Attendance& Working hours

Supervisor of the camp should take the attendance of the employee at each camp twice in a day(morning and evening) and should maintain the record. Further work hours of the workers should be maintained in accordance to the labour law and as mentioned in the labour licence. All workers should be provided with ID card and entry to the site should be through ID card only and should be ensured by security guard.

3.2 Site Barricading

Site should be completely barricaded from all the sides to prevent entry of outsiders and animals into the site. Entry gate should be provided at the site and labour camp which should be guarded by security guard. All workers should be issued ID cards and entry of outsiders shall be maintained in the register at the gate. Board should be displayed at the site and the labour camp, the name of project, capacity of project, authority carrying our projects, restriction of entry without authorization, no smoking zone and associated risks. Plant operation shall be restricted to 6:00 Am to 10:00 PM

3.3 Clean Water Facility

Potable water shall be provided for construction labour for drinking & cooking purpose. Clearwater shall be provided for bathing, cleaning and washing purpose. Water quality testing for drinking water provided for workers shall be carried out on monthly basis. Water dispensers should be cleaned on monthly basis. Adequate water per person should be provided at site for drinking, cooking, bathing, cleaning and other use purpose

3.4 Clean Kitchen Area

Provision of clean kitchen area for cooking and storage of eatables shall be provided. Clean fuels like LPG shall be provided for cooking purpose. Burning of firewood, garbage, paper and any other material for cooking or any other purpose shall strictly be prohibited at the site. Separate utensil washing area should be provided with proper drainage system. Kitchen waste should be daily cleaned and disposed off. Water storage facility at kitchen should be covered and cleaned on monthly basis. Kitchen area should be away from washing, toilets and bathing area.

Wall surfaces adjacent to cooking areas are made of fire-resistant materials. Food preparation tables are also equipped with a smooth durable washable surface. Lastly, in order to enable easy cleaning, it is good practice that stoves are not sealed against a wall, benches and fixtures are not built into the floor, and all cupboards and other fixtures and all walls and ceilings have a smooth durable washable surface.

3.5 Clean Living Facility for the Workers

Workers should be provided with proper bedding facility. Single bed should be provided to each workers and each bed should be at least 1 m apart from another. Double deck bedding should be avoided, in case provided, adequate fire-fighting facility should be provided. Bed linen should be washed regularly and should be applied with repellent and disinfectants so as to manage the diseases caused due to pests. Facilities for storage of personal belongings for workers should be provided in form of locker, shelf or cupboard. A

separate storage area for the tools, boots, PPE should be provided. Proper ventilation through mechanical systems and lighting system should be ensured in construction camps.

3.6 Sanitation Facilities

Construction camps shall be provided with sanitary latrines and urinals. Toilets provided should have running water availability all the time. Bathing, washing & cleaning areas shall be provided at the site for construction labour. Washing and bathing places shall be kept in clean and drained condition. Adequate nos. of bathing & toilet facility should be provided at site and should not exceed 1 unit per 15 persons. Toilets and bathing facility should be closed to the camps

Workers shall be hired especially for cleaning of the toilets and bathing area. Septic tanks and soak pits shall be provided at site for disposal of the sewage generated. The toilets should be cleaned on daily basis. These tanks should be evacuated through authorized vendors if filled and at the time of closure. Pest management should be carried out at the camps if the area is infected by any pests. Adequate lighting should be ensured in camp area especially during night time. The area should be guarded by security guard to minimize the crime and thefts.

3.7 Waste Management Facilities

Waste generated should be segregated at the site by providing the different colour bins for recyclable and non-recyclable waste. Recyclable waste shall be sold to authorized vendors and on-recyclable shall be handed over to authority responsible in area for waste management.

Waste management for construction site shall be as per waste management plan proposed in EMP. Waste management area should be cleaned on regular basis to avoid germination of flies, mosquitoes, rodents and other pests.

3.8 Rest Area for Workers at Site

A rest area/shelter shall be provided at the site for construction workers where they can rest after lunch time and shall not lay down at site anywhere. The height of shelter shall not less than3m from floor level to lowest part of the roof. Sheds shall be kept clean and the space provided shall be on the basis of at least 1.0 Sq. m per head.

3.9 Adequate Illumination & Ventilation

Construction worker camps shall be electrified and adequately illuminated. Illumination level shall be maintained after 5.30 P.M. at the site to minimum 200 lux. Labour camps shall be adequately ventilated. Fans shall be provided for ventilation purpose.

3.10 Safe Access Road for Labour Camps

Temporary paved surface shall be constructed to approach the labour camp from the site. Movement shall not be hampered during monsoon season due to water logging and muddiness.

3.11 Health care Facilities:

First aid box, first aid room and personnel trained in first aid (certified first-aider) shall be available at labour camp and site all the time (24X7). Equipment in first-aid box shall be maintained as pet State Factory's Law. Ambulance/ 4 wheeler motorized vehicle shall be available at the site for carrying injured to the nearby hospital. Tie-ups should be made with nearby hospital to handle emergency, if any. Nos. of ambulance, doctors and nearby hospital shall be displayed in first-aid room, site office & labour camps. List of contact nos. of emergency personnel, hospitals, fire brigade and other emergency contact should be displayed at campsite, guard's room and first aid room. Workers shall be made aware about the causes, symptoms and prevention from HIV/AIDS through posters and awareness programs. Workers shall have access to adequate preventive measures such as contraception (condoms in particular) and mosquito nets.

3.12Crèche Facility & Play School

Crèche facility and play school should be constructed at the site temporarily so as children of construction labour can be kept there. Care takers should be hired for taking care of children. Attendance records of children shall be maintained. Children should not be allowed to enter active work areas.

3.13 Fire-Fighting facilities

Fire-fighting facility such as sand filled buckets and potable fire-extinguishers shall be provided at labour camps and at site. Fire-extinguishers shall be provided as per NBC norms. Personnel trained in handling firefighting equipment should be available at the site. Fire evacuation plan should be displayed at the site and should be communicated to all the workers and other staff at camp site.

3.14 Emergency Assembly Area

Area shall be demarcated as emergency collection area near the gate where all the workers shall be guided to collect in case of any emergency like fire, flood and earthquake.

4.0 Activities prohibited at site

- Activities which should be strictly prohibited at site shall include Open burning of wood, garbage and any other material at sit for cooking or any other purpose
- Disturbance to the local community.
- Adoption of any unfair means or getting indulgence in any criminal activity Noncompliance of the safety guidelines as communicated be safety officials and during the trainings
- Adoption and proper usage of PPEs all the time as required Operation of the plant and machinery between 10 pm to 6 am unless approved by team leader
- No animal (wild or domestic or bird) shall be harmed by any construction worker in any condition at site and nearby areas
- Cutting of tree without permission of team leader/authorized person
- No indigenous population shall be hurt or teased

5.0 Guidelines for night time working at the site.

No activity generating noise shall be carried out at the site after 10:00 PM. Night working protocol should be followed (if required) as per guidelines prepared by FREMAA. Site should be well illuminated to maintain minimum illumination level of 200 lux. Personnel working shall obtain permit to work from the team leader prior carrying out any work in night time and the record of such working shall be maintained in register. Any accidents, if occurs at site during night time working shall be immediately reported and recorded. Penalty shall be imposed on the contractor for the accident. Analysis shall be carried out to find the reason for such accidents for future learning.

6.0 Record keeping & Maintenance

Record of entry/exit of the people in the construction site and labour camp area shall be maintained in register at gate. Record of material coming in and going out from site also shall bemaintained.

7.0 Auditing & Inspection

Conditions of labour camp and site shall be inspected and audit report shall be submitted to IWAI on monthly basis.

8.0 Grievance redressal System

CA complaint register and a complaint box should be provided at the site so any person from local community can register their complaint, if any due to the camp, workers and other facilities. The system shall be communicated to local communities through consultations. Open house

meetings should be conducted with workers on monthly basis to identify their problems and issues if any related health, hygiene, safety, comfort and other issues.

9.0 Security System

Site should be barricaded and should be guarded by security guards at all the gates. Security guards should allow only authorized personnel to the campsite. Guards should be available during both morning and night time. Guard should allow entry of workers to the site only be seeing the ID cards. Guard should report if any unusual or unfair practise happening at site and nearby area. Guards should be trained to handle emergency situations like firefighting and should be responsible to contact the emergency personnel in case of any emergency.

10.0 Closure of the Construction Site and Construction labour Camps

Construction site and labour camps shall be restored back to the original site conditions. Following measures are required to be taken during closure

1. Septic tanks/soak pits should be dismantled
2. Any temporary/permanent structure constructed shall be dismantled
3. Construction/demolition waste, hazardous waste and municipal waste at site and labour camp site shall be disposed as per waste management plan in EMP
4. The site shall be cleaned properly
5. Tree plantation to be carried out, if any required for stabilizing the area
6. Any pit excavated shall be filled back

Along with the Construction and Labour Camp management Plan ECoPs shall be followed by the Contractor.

Appendix 3 to ESMP

Environmental and Social Trainings to be condcuted by the Contractors

Contents	Participants	Responsibility	Schedule
General environmental awareness; Environmental and social sensitivity of the project influence area; Key findings of the EIA; Mitigation measures; EMP; Social and cultural values of the area.	Selected staff of FREMAA/ WRD, supervisor, and contractors/ stakeholders	PMTC/ FREMAA	Prior to the start of the project activities. (To be repeated as needed.)
General environmental and awareness; Environmental and social sensitivity of the project influence area; Mitigation measures; Community issues; Awareness of transmissible diseases; Social and cultural values.	FREMAA/ WRD,PMC; selected contractors' staff/General public	PMTC/ FREMAA	Prior to the start of thefield activities. (To be repeated as needed.)
ESMP; Waste disposal;	Construction crew	Contractors	Prior to the start of the construction activities. (To be repeated as needed.)
Road/waterway safety; Defensive driving; Waste disposal; Cultural values and social sensitivity.	Drivers/ vehicle operators	Contractors	Before and during thefield operations. (To be repeated as needed.)
Camp operation; Waste disposal; Natural resource conservation.	Camp staff	Contractors	Before and during thefield operations. (To be repeated as needed.)
Restoration requirements; Waste disposal.	Restoration teams	Contractors	Before the start of the restoration activities.
Conservation of important flora / fauna Cultural resources;	FREMAA/ WRD staff; supervisor; selected contractors' staff	Contractors, Supervisor and E&S cell	Before the start of the restoration activities.