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BANGLADESH WATER DEVELOPMENT BOARD



Tender Document For Procurement of Works (International)

Name of Project: Capital (Pilot) Dredging of the
River System in Bangladesh

PROTECTIVE WORK OF 4(FOUR) NOS. CROSS
BAR/CLOSURE CONSTRUCTED BY DREDGED SPOIL AND
ADJACENT AREA (RECLAIMED LAND) AT UPAZILA:
SIRAJGANJ SADAR, DISTRICT: SIRAJGANJ.

**Project Director
Project Management Unit (PMU)
Capital (Pilot) Dredging of River System in Bangladesh**

**Invitation for Tender: CDRSB/T-1/2013-2014
Issued on: 04 February, 2014.
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Section 1. Instructions to Tenderers

A. General

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| 1.Scope of Tender | <p>1.1 The Employer, as indicated in the Tender Data Sheet (TDS) issues this Tender Document for the procurement of Works and associated Services incidental thereto as specified in the TDS and as detailed in Section 6: Bill of Quantities. The name of the Tender and the number and identification of its constituent lot(s) are stated in the TDS.</p> <p>1.2 The successful Tenderer shall be required to execute the works and physical services as specified in the General Conditions of Contract</p> |
| 2. Interpretation | <p>2.1 Throughout this Tender Document:</p> <ul style="list-style-type: none">(a) the term “in writing” means communication written by hand or machine duly signed and includes properly authenticated messages by facsimile or electronic mail;(b) if the context so requires, singular means plural and vice versa;(c) “day” means calendar days unless otherwise specified as working days;(d) “Tender Document” means the Document provided by a Employer to a Tenderer as a basis for preparation of the Tender; and(e) “Tender” depending on the context, means a Tender submitted by a Tenderer for execution of Works and Physical Services to the Employer in response to an Invitation for Tender. |
| 3.Source of Funds | <p>3.1 The Employer has been allocated ‘public funds’ as indicated in the TDS and intends to apply a portion of the funds to eligible payments under the Contract for which this Tender Document is issued.</p> <p>3.2 For the purpose of this provision, “public funds” means any funds allocated to the Employer under Government budget, or loan, grants and credits placed at the disposal of the Employer through the Government by the Development Partners or foreign states or organisations.</p> <p>3.3 Payments by the Development Partner, if so indicated in the TDS, will be made only at the request of the Government and upon approval by the Development Partner or foreign state or organisation in accordance with the applicable Loan / Credit / Grant Agreement, and will be subject in all respects to the terms and conditions of that Agreement.</p> |

4. Corrupt, Fraudulent, Collusive or Coercive Practices

- 4.1 The Government requires that Employer, as well as Tenderers and Contractors shall observe the highest standard of ethics during implementation of procurement proceedings and the execution of Contracts under public funds.
- 4.2 The Government requires that Employer, as well as Tenderers and Contractors shall, during the Procurement proceedings and the execution of Contracts under public funds, ensure-
- (a) strict compliance with the provisions of Section 64 of the Public Procurement Act, 2006;
 - (b) attending by the code of ethics as mentioned in the Rule 127 of the Public Procurement Rules, 2008;
 - (c) that neither it's any officer nor any staff nor any other agents nor intermediaries working on its behalf engages in any such practice as detailed in ITT Sub Clause 4.2(b).
- 4.3 Should any corrupt, fraudulent, collusive or coercive practice of any kind come to the knowledge of the Employer, it will, in the first place, allow the Tenderer to provide an explanation and shall, take actions only when a satisfactory explanation is not received. Such decision and the reasons thereof, shall be recorded in the record of the procurement proceedings and promptly communicated to the Tenderer concerned. Any communications between the Tenderers and the Employer related to matters of alleged fraud or corruption shall be in writing.
- 4.4 If corrupt, fraudulent, collusive or coercive practices of any kind is determined by the Employer against any Tenderer alleged to have carried out such practices, the Employer shall :
- (a) exclude the concerned Tenderer from further participation in the particular Procurement proceeding; or
 - (b) reject any recommendation for award that had been proposed for that concerned Tenderer; or
 - (c) declare, at its discretion, the concerned Tenderer to be ineligible to participate in further Procurement proceedings, either indefinitely or for a specific period of time.
- 4.5 Tenderers shall be aware of the provisions on corruption, fraudulence, collusion and coercion in Section 64 of the Public Procurement Act, 2006 and Rule 127 of the Public Procurement Rules, 2008.

5. Eligible Tenderers

- 5.1 This Invitation for Tenders is open only to the pre-qualified Tenderers for this particular procurement proceeding.
- 5.2 To establish that the Tenderer continues to meet the criteria used at the time of pre-qualification, the Tenderer shall provide updated information on any assessed aspects including **litigation history** in Tender Submission Letter (**PW5-1**) that changed from the time the Tenderer was pre-qualified for this particular procurement proceeding.

- 5.3 Tenderers shall have the legal capacity to enter into the Contract under the Applicable Law.
- 5.4 Tenderers shall provide such evidence of their continued eligibility satisfactory to the Employer, as the Employer will reasonably request.
- 5.5 Tenderers' requirements for eligibility will extend, as applicable, to each JV partner and Specialist Subcontractor proposed by the Tenderer.
- 6. Eligible Materials, Equipment and Associated Services**
- 6.1 All materials, equipment and associated services to be supplied under the Contract are from eligible sources, unless their origin is from a country specified in the TDS.
- 6.2 For the purposes of this Clause, "**origin**" means the place where the Materials and Equipments are mined, grown, cultivated, produced or manufactured or processed, or through manufacturing, processing, or assembly, another commercially recognized new product results that differs substantially in its basic characteristics from its components or the place from which the associated services are supplied.
- 7. Site Visit**
- 7.1 Tenderers are advised to visit and examine the Site of Works and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the Tender and entering into a contract for construction of the Works.
- 7.2 Tenderers and any of its personnel or agents will be granted permission by the Employer to enter into its premises and lands for the purpose of such visit, but only upon the express condition that the Tenderer, its personnel, and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.
- 7.3 The costs of visiting the Site shall be at the Tenderer's own expense.

B. Tender Document

- 8. Tender Document: General**
- 8.1 The Sections comprising the Tender Document are listed below, and should be read in conjunction with any Addendum issued under ITT Clause 11.
- Section 1 Instructions to Tenderers (ITT)
 - Section 2 Tender Data Sheet (TDS)
 - Section 3 General Conditions of Contract (GCC)
 - Section 4 Particular Conditions of Contract (PCC)
 - Section 5 Tender and Contract Forms
 - Section 6 Bill of Quantities (BOQ)
 - Section 7 General Specifications
 - Section 8 Particular Specifications
 - Section 9 Drawings

- 8.2 The Employer will not take into consideration any Tender if the Tender Document was not directly purchased from or issued by, the Employer, or through its agent(s) as stated in the TDS.
- 8.3 Tenderers are expected to examine all instructions, forms, terms, and specifications in the Tender Document as well as in Addendum to Tender, if any.
- 9. Clarification of Tender Document**
- 9.1 Tenderers requiring any clarification of the Tender Document shall contact the Employer in writing at the Employer's address indicated in the TDS before **two-third** of the time allowed for preparation and submission of Tender elapses.
- 9.2 The Employer is not obliged to answer any clarification request received after that date as stated under ITT Sub Clause 9.1.
- 9.3 The Employer shall respond in writing within five (5) working days of receipt of any such request for clarification received under ITT Sub Clause 9.1.
- 9.4 The Employer shall forward copies of its response to all those who have purchased or have been issued with the Tender Document, including a description of the enquiry but without identifying its source.
- 9.5 Should the Employer deem it necessary to revise the Tender Document as a result of a clarification, it will do so following the procedure under ITT Clause 11 and ITT Sub Clause 38.2.
- 10.Pre-Tender Meeting**
- 10.1 To clarify issues and to answer questions on any matter arising in the Tender Document, the Employer may, if stated in the TDS, hold a pre-Tender Meeting at the place, date and time as specified in the TDS. All pre-qualified Tenderers are encouraged and invited to attend the meeting, if it is held.
- 10.2 Minutes of the pre-Tender meeting, including the text of the questions raised and the responses given, together with any responses prepared after the meeting, will be transmitted within seven (7) days of holding the meeting to all those who purchased or obtained the Tender Document and, to even those who did not attend the meeting. Any revision to the Tender Document listed in ITT Sub-Clause 8.1 that may become necessary as a result of the pre-Tender meeting will be made by the Employer exclusively through the issue of an Addendum pursuant to ITT Sub Clause 11 and not through the minutes of the Pre-Tender meeting.
- 10.3 Non-attendance at the Pre-Tender meeting will not be a cause for disqualification of a Tenderer.
- 11.Addendum to Tender Document**
- 11.1 At any time prior to the deadline for submission of Tenders, the Employer, on its own initiative or in response to an inquiry in writing from a Tenderer, having purchased the Tender Document, or as a result of a Pre-Tender meeting may revise the Tender Document by issuing an Addendum.
- 11.2 The Addendum issued under ITT Sub Clause 11.1 shall become an

integral part of the Tender Document and shall have a date and an issue number and must be circulated by fax, mail or e-mail, to Tenderers who have purchased or been issued with the Tender Documents within five (5) working days of issuance of such Addendum, to enable Tenderers to take appropriate action.

- 11.3 Tenderers shall acknowledge receipt of an Addendum within three (3) working days.
- 11.4 The Employer shall also ensure posting of the relevant Addenda with the reference number and date on their websites including notice boards, where the Employer had originally posted the IFTs.
- 11.5 Tenderers who have purchased or been issued with the Tender Documents and, have not received any Addenda issued under ITT Sub Clause 11.1 shall inform the Employer of the fact by fax, mail or e-mail, before **two- third** of the time allowed for the submission of Tender has elapsed.
- 11.6 To give pre-qualified Tenderers a reasonable time in which to take an Addendum into account in preparing its Tender, the Employer may, at its discretion, extend the deadline for the submission of Tenders as stated under ITT Sub Clause 38.2.
- 11.7 If an Addendum is issued when time remaining is less than **one-third** of the time allowed for the preparation of Tenders, a Employer shall extend the deadline by an appropriate number of days for the submission of Tenders, depending upon the nature of the Procurement requirement and the addendum. The minimum time for such extension shall not be less than three (3) days.

C. Qualification Criteria

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| 12. Qualification | <p>12.1 Tenderers shall be able to atendere by the professional and ethical standards set out in Section 64 of the Public Procurement Act, 2006 and Rule 127 of the Public Procurement Rules, 2008.</p> <p>12.2 To establish that the Tenderer continues to meet the criteria used at the time of pre-qualification, the Tenderer shall provide updated information on any assessed aspects including litigation history in Tenderer Information (PW5-2), JV Partner Information (PW5-3), as applicable, Subcontractor Information (PW5-4), as applicable, Personnel Information (PW5-5) and the Schedule of Equipments that changed from the time the Tenderer was pre-qualified for this particular procurement proceeding.</p> |
| 13. Joint Venture, Consortium or Association (JVCA) | <p>13.1 Tenderers may participate in the procurement proceedings in a Joint Venture, Consortium or Associations (JVCA) as formed, or alternately with an agreement supported by a Letter of Intent as intended; whichever assessed earlier at the time of pre-qualification.</p> <p>13.2 Tenderers shall submit along with the Tender the copies of the JV agreement or the Letter of Intent and the proposed JV agreement, assessed at the time of pre-qualification.</p> |

- 13.3 Each partner of the JV shall be jointly and severally liable for the execution of the Contract, all liabilities and ethical and legal obligations in accordance with the Contract terms.
- 13.4 The JV shall nominate a Representative (partner-in-charge) who shall have the authority to conduct all business for and on behalf of any and all the partners of the JV during the tendering process and, in the event the JV is awarded the Contract, during contract execution including the receipt of payments for and on behalf of the JV.
- 13.5 The composition or the constitution of a JV formed, assessed, and pre-qualified, shall not be allowed to be altered prior to signing of the Contract.
- 13.6 Alteration of partners to the composition or constitution at a date later than the signing of the Contract during execution shall be allowed by the Employer only when any of such partners is found to be incompetent or has serious difficulties which may impact the overall implementation of the proposed Works, where the incoming partner shall require to have qualifications higher than that of the outgoing partner.
- 13.7 Each partner of the JV shall complete the JV Partner Information (**Form PW5-3**) for submission with the Tender.
- 14. Subcontract or(s)**
- 14.1 Tenderers may intend to subcontract an activity or part of the Works to a Specialist Subcontractor, in which case such elements and the proposed Subcontractor shall be clearly identified and its qualifications supported by documents.
- 14.2 A Specialist Subcontractor may participate in more than one Tender, but only in that capacity.
- 14.3 The Employer may require Tenderers to provide more information about their subcontracting arrangements. If any Specialist Subcontractor is found ineligible or unsuitable to carry out the subcontracted tasks, the Employer may request the Tenderer to propose an acceptable substitute.
- 14.4 The Employer may also select in advance Nominated Subcontractor(s) to execute certain specific components of the Works and if so, those will be specified in the TDS.
- 14.5 The successful Tenderer shall under no circumstances assign the Works or any part of it to the Subcontractor(s).
- 14.6 Each Specialist Subcontractor shall complete the Specialist Subcontractor Information (**Form PW5-4**) for submission with the Tender.
- 15. Domestic Preference**
- 15.1 If so specified in the TDS, a national Tenderer including Joint Venture comprising only national partners shall qualify for a percentage margin of '**domestic preference**' provided the conditions set out in ITT Sub Clause 15.2 are fully met.
- 15.2 The requirements of a national Tenderer to qualify for '**domestic preference**' shall be :
- (a) for an individual firm

- (i) it is registered within Bangladesh
 - (ii) it has more than fifty (50) percent ownership by the nationals of Bangladesh
 - (iii) it does not subcontract more than twenty (20) percent of the Tender price, excluding provisional sums, to foreign contractors
 - (iv) it meets any other requirements specified in this document
- (b) for a Joint Venture
- (i) it is registered in Bangladesh
 - (ii) the individual partners are registered in Bangladesh and have more than 50 percent ownership by the nationals of Bangladesh
 - (iii) it does not sub-contract more than twenty (20) percent of the Tender price, excluding the provisional sums, to foreign contractors
 - (iv) it meets any other requirements specified in this document.
- 15.3 The national Tenderer qualifying for '**domestic preference**', as stated under ITT Sub Clause 15.2, shall receive a seven and half (7.5) percent margin of preference only in the evaluation of its Tender(s) while comparing the same with those of other Tenderers.

D. Tender Preparation

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| 16.Only One Tender | 16.1 Tenderers shall submit only one (1) Tender for each lot, either individually or as a JV. The Tenderer who submits or participates in more than one (1) Tender in one (1) lot will cause all the Tenders of that particular Tenderer to be considered non-responsive. |
| 17.Cost of Tendering | 17.1 Tenderers shall bear all costs associated with the preparation and submission of its Tender, and the Employer shall not be responsible or liable for those costs, regardless of the conduct or outcome of the Tendering process. |
| 18.Issuance and Sale of Tender Document | <p>18.1 The Employer shall make Tender Documents available immediately to the pre-qualified Tenderers, requesting to obtain and willing to purchase at the corresponding price by the date the advertisement has been published in the newspaper.</p> <p>18.2 Full contact details, with mailing address, telephone and facsimile numbers and electronic mail address, as applicable, of those to whom the Tender Documents have been issued shall be recorded with a reference number by the Employer or its agents.</p> <p>18.3 There shall not be any pre-conditions whatsoever, for sale or issuance of Tender Documents and, the sale or issuance of such Document shall be permitted up to the day prior to the day of deadline for the submission of Tender.</p> <p>18.4 Tender Document posted in the designated website may also be used by the Tenderer for submission of Tenders, if so permitted by the Employer and specified in the TDS.</p> |
| 19.Language of | 19.1 The Tender shall be written in the English language. Correspondences and documents relating to the Tender may be |

Tender	written in English. Supporting documents and printed literature furnished by the Tenderer that are part of the Tender 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 Tender, such translation shall govern.
	19.2 Tenderers shall bear all costs of translation to the governing language and all risks of the accuracy of such translation.
20. Contents of Tender	20.1 The Tender prepared by the Tenderers shall comprise the following: (a) the Tender Submission Letter (Form PW5-1) and Appendix to Tender; (b) Tenderer Information (Form PW5-2), as stated under ITT Sub Clause 12.2; (c) the priced Bill of Quantities and the completed Schedules for each lot in accordance with ITT Clauses 21,23 and 24; (d) Tender Security, as stated under ITT Clauses 31, 32 and 33. (e) alternatives, if permissible, as stated under ITT Clause 22; (f) written confirmation authorizing the signatory of the Tender to commit the Tenderer, as stated under ITT Sub Clause 36.3; (g) documentary evidence, establishing the origin of all Materials, Equipment and services to be supplied under the Contract, as stated under ITT Clause 26; (h) documentary evidence, establishing that the Tenderer is pre-qualified for this particular procurement proceeding, as stated under ITT Sub Clause 5.1; (i) documentary evidence, establishing the Tenderer's continued eligible and qualified status, as stated under ITT Sub Clause 5 and 12; (j) Technical Proposal describing work plan & method, personnel, equipment and schedules, as stated under ITT Clause 27; and (k) any other document as specified in the TDS. 20.2 In addition to the requirements stated under ITT Sub Clause 20.1, Tenders submitted by a JV or proposing a Specialised Subcontractor shall include updates, if any, on : (a) Joint Venture Agreement legally entered into in the Tenderer's Leading Partner's country of origin, by all partners, as stated under ITT Sub Clause 13.1; or (b) Letter of Intent along with the proposed agreement duly signed by all partners of the intended JV and authenticated by an authority of the Tenderer's Leading Partner's country of origin with the declaration that it will execute the Joint Venture Agreement in the event the Tenderer is successful, as stated under ITT Sub Clause 13.1; (c) the JV Partner Information (Form PW5-3), as stated under ITT Sub Clause 12.2; (d) the Specialist Subcontractor Information (Form PW5-4), as stated under ITT Sub Clause 12.2. 21.1 Tenderers shall submit the Tender Submission Letter (Form PW5-
21.Tender	

Submission Letter and Bill of Quantities	1), which shall be completed without any alterations to its format, filling in all blank spaces with the information requested, failing which the Tender may be considered non-responsive as being incomplete.
	21.2 Tenderers shall submit the priced Bill of Quantities using the form(s) furnished in Section 6: Bill of Quantities .
	21.3 If in preparing its Tender, the Tenderer has made errors in the unit rate or price or the total price, and wishes to correct such errors prior to submission of its Tender, it may do so, but shall ensure that each correction is initialled by the authorised person of the Tenderer and that a statement shall be made as to the total number of initialled corrections made, at the end of the priced Bill of Quantities in Section 6 .
22. Alternatives	22.1 Unless otherwise stated in the TDS, alternatives shall not be considered.
	22.2 When alternative times for completion are explicitly invited, a statement to that effect will be included in the TDS, as will the method of evaluating different times for completion.
	22.3 Except as provided under ITT Sub Clause 22.4, Tenderers wishing to offer technical alternatives to the requirements of the Tender Documents must first price the Employer's design as described in the Tender Documents and shall further provide all information necessary for a complete evaluation of the alternative by the Employer, including drawings, designs, design calculations, technical specifications, breakdown of prices, and proposed construction methodology and other relevant details.
	22.4 When specified in the TDS, Tenderers are permitted to submit alternative technical solutions for specified parts of the Works, and such parts will be identified in the TDS.
	22.5 Only the technical alternatives, if any, of the lowest evaluated Tenderer conforming to the basic technical requirements will be considered by the Employer.
23.Tender Prices, Discounts and Price Adjustment	23.1 The prices and discounts quoted by the Tenderer in the Tender Submission Letter (Form PW5-1) and in the Bill of Quantities (BOQ) shall conform to the requirements specified below.
	23.2 Tenderers shall fill in unit rates or prices for all items of the Works both in figures and in words as described in the BOQ. The rates or prices shall be inclusive of profit and overhead and, all kinds of applicable taxes, customs duties, fees, levies, and other charges to be paid.
	23.3 The items quantified in the BOQ for which no unit rates or prices have been quoted by the Tenderer will not be paid for, by the Employer when executed and shall be deemed covered by the amounts of other rates or prices in the BOQ and, it shall not be a reason to change the Tender price.
	23.4 The Employer may, if necessary, require the Tenderer to submit the detail breakdown of the unit rates or prices quoted by the Tenderer for the facilitation of the Tender proceedings.
	23.5 The Tender price shall be calculated on the basis defined in the ITT which is the unit rates or prices applied to Works proposed in

the priced BOQ of this Tender Document.

- 23.6 The price to be quoted in the Tender Submission Letter, as stated under ITT Sub Clause 21.1, shall be the total price of the Tender, **excluding any discounts offered, only in case of being awarded more than one lot, by the Tenderer.**
- 23.7 Tenderers shall quote any unconditional discounts for being awarded more than one lot if so specified in the TDS and the methodology for application of discount in the Tender Submission Letter as stated under ITT Sub Clause 21.1.
- 23.8 If so indicated under ITT Sub Clause 23.7, Tenders are being invited for individual lots or for any combination of lots. Tenderers wishing to offer any price reduction for the award of more than one lot shall specify in their Tender the price reductions applicable to each lot, or alternatively, to any combination of lots within the package. Price reductions or discounts will be submitted as stated under ITT Sub Clause 23.1, provided the Tenders for all lots are submitted and opened together.
- 23.9 All kinds of applicable taxes ,customs duties, fees, levies, VAT and other charges payable by the Contractor under the Contract, or for any other causes, as of the date twenty-eight (28) days prior to the deadline for submission of Tenders, shall be included in the unit rates and prices and the total Tender price submitted by the Tenderer.
- 23.10 Unless otherwise provided in the TDS and the PCC, the price of a Contract shall be fixed in which case the unit rates or prices may not be modified in response to changes in economic or commercial conditions.
- 23.11 If so indicated under ITT Sub Clause 23.10, Tenders are being invited with a provision for price adjustments. The unit rates or prices quoted by the Tenderer are subject to adjustment during the performance of the Contract in accordance with the provisions of GCC Clause 74 and, in such case the Employer shall provide the indexes and weightings or coefficients in **Appendix to the Tender** for the price adjustment formulae specified in the PCC.
- 23.12 The Employer may require the Tenderer to justify its proposed indexes, if any of those as stated under ITT Sub Clause 23.11 are instructed to be quoted by the Tenderer in **Appendix to the Tender.**
- 23.13 The formulas, indexes, coefficients and procedures to be followed as referred to in the PCC shall be used to determine whether economic or commercial conditions have changed during performance of the Contract to significant degree to justify a price adjustment and to identify the amount of increase and the frequency with which price adjustments shall be implemented.
- 23.14 The price adjustment stated under ITT Sub Clause 23.11 shall be dealt with in accordance with the provisions set out in this Tender Document.

**24.Tender
Currency and
Payments**

- 24.1 The currency of the Tender shall be either in USD or GBP or EUR or JPY and/or Bangladesh Taka as specified in the TDS.
- 24.2 The currency of Tender for the portion of local inputs shall be

	expressed in Bangladesh Taka.
	24.3 The national Tenderers including Joint Venture of national partners shall be able to express their Tenders in combination of local and foreign currency (ies) similar to foreign Tenderer; whereby a price breakdown be provided in support of demand for foreign currency.
	24.4 The currency of payments, as stated under ITT Sub Clauses 24.1 and 24.2 shall be as specified in the TDS.
25.Documents Establishing Eligibility of the Tenderer	25.1 To establish that the Tenderer continues to meet the criteria used at the time of pre-qualification, the Tenderer shall provide updated information on any assessed aspects including litigation history in Tender Submission Letter (PW5-1) that changed from the time the Tenderer was pre-qualified for this particular procurement proceeding.
26.Documents Establishing the Eligibility and Conformity of Materials, Equipment and Services	26.1 Tenderers shall submit documentary evidence to establish the origin of all Materials, Equipment and services to be supplied under the Contract as stated under ITT Clause 6.
	26.2 To establish the conformity of the Materials, Equipment and services to be supplied under the Contract, the Tenderer shall furnish, as part of its Tender, the documentary evidence (which may be in the form of literature, specifications and brochures, drawings or data) that these conform to the technical specifications and standards specified in Section 7, General Specifications and Section 8, Particular Specifications .
27.Documents Establishing Technical Proposal	27.1 Tenderers shall furnish a Technical Proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in TDS, in sufficient detail to demonstrate the adequacy of the Tenderer's proposal to meet the work requirements and the completion time.
28.Documents Establishing the Tenderer's Qualification	28.1 To establish that the Tenderer continues to meet the criteria used at the time of pre-qualification, the Tenderer shall provide updated information on any assessed aspects in Tenderer Information (PW5-2), JV Partner Information (PW5-3), as applicable, Subcontractor Information (PW5-4), as applicable, Personnel Information (PW5-5) and the Schedule of Equipments that changed from the time the Tenderer was pre-qualified for this particular procurement proceeding.
	28.2 If ' domestic preference ' applies as stated under ITT Sub Clause 15.1, the national Tenderers, individually or in Joint Ventures, applying for eligibility for ' domestic preference ' shall provide all information required to satisfy the criteria for eligibility as stated under ITT Sub Clause 15.2.
29.Validity Period of Tender	29.1 Tender Validities shall be determined on the basis of the complexity of the Tender and the time needed for its examination, evaluation, approval of the Tender and issuance of the Notification of Award.
	29.2 Tenders shall remain valid for the period specified in the TDS after the date of Tender submission deadline prescribed by the Employer, as stated under ITT Sub Clause 29.1. A Tender valid for a period shorter than that specified will be considered non-

responsive by the Employer.

**30.Extension of
Tender
Validity and
Tender
Security**

- 30.1 In justified exceptional circumstances, prior to the expiration of the Tender validity period, the Employer may solicit not later than ten (10) days before the expiry date of the Tender Validity, compulsorily all the Tenderers' consent to an extension of the period of validity of their Tenders.
- 30.2 The request for extension of Tender Validity period shall state the new date of the validity of the Tender.
- 30.3 The request from the Employer and the responses from the Tenderers will be made in writing.
- 30.4 Tenderers consenting in writing to the request made by the Employer under ITT Sub Clause 30.3 shall also correspondingly extend the validity of its Tender Security for twenty eight (28) days beyond the new date for the expiry of the Tender Validity.
- 30.5 Tenderers consenting in writing to the request as stated under ITT Sub Clause 30.3 shall not be required or permitted to modify its Tender in any circumstances.
- 30.6 If the Tenderers are not consenting in writing to the request made by the Employer as stated under ITT Sub Clause 30.2, its Tender shall not be considered in the subsequent evaluation.

**31.Tender
Security**

- 31.1 Tender Securities and its amounts shall be determined sufficient to discourage the submission of frivolous and irresponsible Tenders shall be rounded fixed amount and, shall not be stated as a precise percentage of the estimated total Contract price.
- 31.2 Tenderers shall furnish as part of its Tender, in favour of the Employer or as otherwise directed on account of the Tenderer, a Tender Security in original form and, in currency of the Tender, as stated under ITT Sub Clause 31.1, of the amount as specified in the TDS.
- 31.3 If the Tender is a Joint Venture, the Tenderer shall furnish as part of its Tender, in favour of the Employer or as otherwise directed on account of the title of the existing or intended JV or any of the partners of that JV, a Tender Security in original form and in currency of the amount as stated under ITT Sub Clause 31.2.

32. Form of Tender Security	32.1 The Tender Security shall: (a) be in the form of an irrevocable Bank Guarantee issued by an internationally reputable Bank which has a correspondent Bank located in Bangladesh, in the format (Form PW5-6) furnished in Section 5: Tender and Contract Forms; (b) be payable promptly upon written demand by the Employer in the case of the conditions listed in ITT Sub Clause 35 being invoked; and (c) remain valid for at least twenty eight (28) days beyond the expiry date of the Tender Validity in order to make a claim in due course against a Tenderer in the circumstances as stated under ITT Sub Clause 35 and pursuant to Rule 25 of the Public Procurement Rules, 2008.
33. Authenticity of Tender Security	33.1 The authenticity of the Tender Security submitted by a Tenderer shall be examined and verified by the Employer in writing from the Bank issuing the security, prior to finalization of the Evaluation Report. 33.2 If a Tender Security is found to be not authentic, the Tender which it covers shall not be considered for subsequent evaluation and in such case the Employer shall proceed to take punitive measures against that Tenderer as stated under ITT Sub Clause 4.4. 33.3 A Tender not accompanied by a valid Tender Security as stated under ITT Clause 31, 32 and 33 will be considered non-responsive by the Employer.
34. Return of Tender Security	34.1 No Tender Securities shall be returned by the Tender Opening Committee (TOC) during and after the opening of the Tenders. 34.2 No Tender Security shall be returned to the Tenderers before contract signing, except to those who are considered non-responsive. 34.3 Tender Securities of the non-responsive Tenders shall be returned immediately after the Evaluation Report has been approved by the Employer. 34.4 Tender Securities of the responsive Tenders shall be returned only after the lowest evaluated Tenderer has submitted the Performance Security and signed the Contract; that being even before the expiration of the Tender Validity period as stated under ITT Clause 29. 34.5 Tender Securities of the Tenderers not consenting within the specified date in writing to the request made by the Employer under ITT Sub Clause 30.2 in regard to extension of its Tender Validity shall be discharged or returned forthwith.
35. Forfeiture of Tender	35.1 Tender Security may be forfeited, if a Tenderer: (a) withdraws its Tender after opening of Tenders but within the

Security

- validity of the Tender as stated under ITT Clause 29 and 30;
or
- (b) refuses to accept a Notification of Award as stated under ITT Sub Clause 60.3 ;
or
- (c) fails to furnish Performance Security as stated under ITT Sub Clause 61.2 and 61.3 ;
or
- (d) refuses to sign the Contract as stated under ITT Sub Clause 65.2;
or
- (e) does not accept the correction of the Tender price following the correction of the arithmetic errors as stated under ITT Clause 51.

**36.Format and
Signing of
Tender**

- 36.1 The Tenderer shall prepare one (1) original of the documents comprising the Tender as described in ITT Clause 20 and clearly mark it "ORIGINAL." In addition, the Tenderer shall prepare the number of copies of the Tender, as specified in the TDS and clearly mark each of them "COPY." In the event of any discrepancy between the original and the copies, the ORIGINAL shall prevail.
- 36.2 Alternatives, if permitted in accordance with ITT Clause 22, shall be clearly marked "Alternative".
- 36.3 The original and each copy of the Tender shall be typed or written in indelible ink and shall be signed by the Person duly authorized to sign on behalf of the Tenderer. This authorization shall consist of a written authorization and shall be attached to the Tender Submission Letter (**Form PW5-1**). The name and position held by each Person(s) signing the authorization must be typed or printed below the signature. All pages of the original and of each copy of the Tender, except for un-amended printed literature, shall be numbered sequentially and signed or initialled by the person signing the Tender.
- 36.4 In case of JV, the application of the provisions as stated under ITT Sub Clause 36.3 shall extend up to each partner of that existing or intended JV.
- 36.5 Any interlineations, erasures, or overwriting will be valid only if they are signed or initialled by the Person(s) signing the Tender.
- 36.6 Person(s) signing the Tender shall describe his or her name, address, position along with his or her national Identification Number, if any.

E. Tender Submission**37.Sealing,
Marking and
Submission of
Tender**

- 37.1 The Tenderer shall enclose the original in one (1) envelope and all the copies of the Tender, including the alternatives, if permitted under ITT Clause 22, in another envelope, duly marking the envelopes as "ORIGINAL" "ALTERNATIVE" (if

permitted) and "COPY." These sealed envelopes will then be enclosed and sealed in one (1) single outer envelope.

37.2 The inner and outer envelopes shall:

- (a) be addressed to the Employer at the address as stated under ITT Sub Clause 38.1;
- (b) bear the name of the Tender and the Tender Number as stated under ITT Sub Clause 1.1;
- (c) bear the name and address of the Tenderer;
- (d) bear a statement "DO NOT OPEN BEFORE -----
-----" the time and date for Tender opening as stated under ITT Sub Clause 44.2;
- (e) bear any additional identification marks as specified in the TDS.

37.3 The Tenderer is solely and entirely responsible for pre-disclosure of Tender information if the envelope(s) are not properly sealed and marked.

37.4 Tenders shall be delivered by hand or by mail, including courier services at the address(s), as stated under ITT Sub Clause 38.1.

37.5 Tenders shall be submitted on the basis of this Tender Document issued by the Employer.

37.6 The Employer will, on request, provide the Tenderer with acknowledgement of receipt showing the date and time when it's Tender was received.

**38. Deadline for
Submission of
Tender**

38.1 Tenders shall be delivered to the Employer at the address specified in the TDS and no later than the date and time specified in the TDS.

38.2 The Employer may, at its discretion on justifiably acceptable grounds duly recorded, extend the deadline for submission of Tender as stated under ITT Sub Clause 38.1, in which case all rights and obligations of the Employer and Tenderers previously subject to the deadline will thereafter be subject to the new deadline as extended.

38.3 If submission of Tenders for this procurement is allowed in more than one location, the date and time for submission of Tender at the primary and secondary place(s) shall be as specified in the TDS.

38.4 The Employer shall ensure that the Tenders received at the secondary place(s) are hand-delivered at the primary place as stated under ITT Sub Clause 38.1 before the time specified in the TDS; but in no case later than **THREE (3) HOURS** after the deadline for submission of Tenders at the secondary place(s) in case of **MULTIPLE DROPPING**.

39. Late Tender

39.1 Any Tender received by the Employer after the deadline for

submission of Tenders as stated under ITT Sub Clause 38.1 shall be declared LATE, excluded, and returned unopened to the Tenderer.

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| 40.Modification, Substitution or Withdrawal of Tender | <p>40.1 Tenderers may modify, substitute or withdraw its Tender after it has been submitted by sending a written notice duly signed by the authorized signatory and properly sealed, and shall include a copy of the authorization confirmed by an affidavit authenticated by an authority of the Tenderer's Leading Partner's country of origin; provided that such written notice including the affidavit is received by the Employer prior to the deadline for submission of Tenders as stated under ITT Clause 38.</p> <p>40.2 If submission of Tenders for this procurement is allowed in more than one location, the Tenderer may modify, substitute or withdraw its Tender as stated under ITT Sub Clause 40.1 after it has been submitted, prior to the deadline prescribed for submission of Tenders at the primary place.</p> |
| 41.Tender Modification | <p>41.1 Tenderers shall not be allowed to retrieve its original Tender, but shall be allowed to submit corresponding modification to its original Tender marked as "MODIFICATION".</p> |
| 42.Tender Substitution | <p>42.1 Tenderers shall not be allowed to retrieve its original Tender, but shall be allowed to submit another Tender marked as "SUBSTITUTION".</p> |
| 43.Withdrawal of Tender | <p>43.1 Tenderers shall be allowed to withdraw its Tender by a Letter of Withdrawal marked as "WITHDRAWAL".</p> |

F. Tender Opening and Evaluation

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| 44.Tender Opening | <p>44.1 Tenders shall be opened pursuant to Rule 97 following steps in Part D of Schedule IV of the Public Procurement Rules, 2008.</p> <p>44.2 Tenders shall be opened immediately after the deadline for submission of Tenders at the primary place irrespective of SINGLE DROPPING and MULTIPLE DROPPING as specified in the TDS but no later than ONE HOUR after expiry of the submission deadline at the same primary place. Tender opening shall not be delayed on the plea of absence of Tenderers or his or her representatives.</p> <p>44.3 Persons not associated with the Tender may not be allowed to attend the public opening of Tenders.</p> <p>44.4 Tenderers' representatives shall be duly authorised by the Tenderer. Tenderers or their authorised representatives will be allowed to attend and witness the opening of Tenders, and will sign a register evidencing their attendance.</p> <p>44.5 The authenticity of withdrawal or substitution of, or modifications to original Tender, if any made by a Tenderer in specified manner, shall be examined and verified by the Tender Opening Committee (TOC) based on documents submitted as</p> |
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stated under ITT Sub Clause 40.1.

44.6 Tenders will be opened in the following manner:

- (a) firstly, envelopes marked "Withdrawal" shall be opened and "Withdrawal" notices read aloud and recorded and the envelope with the corresponding Tender shall not be opened, but returned unopened to the Tenderer by the Employer at a later time immediately after preliminary examination by the Tender Evaluation Committee as stated under ITT Sub Clause 47. No Tender withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and in such case the Tender shall be read aloud at the Tender opening ;
- (b) secondly, the remaining Tenders will be sorted out and those marked "Substitution" or "Modification" will be linked with their corresponding "Original"(O) Tender;
- (c) Next, envelopes marked "Substitution"(S) shall be opened and read aloud and recorded, and exchanged with the corresponding Tender being substituted, and the substituted Tender shall not be opened, but returned unopened to the Tenderer by the Employer at a later time immediately after preliminary examination by the Tender Evaluation Committee as stated under ITT Sub Clause 47. No Tender substitution shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution and in such case the Tender shall be read aloud at the Tender opening;
- (d) Next envelopes marked "Modification" (M) shall be opened and read aloud with the corresponding Tender and recorded. No Tender modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and in such case the Tender shall be read aloud at the Tender opening;
- (e) thirdly, if so specified in this Tender Document, the envelopes marked "Alternative" (A) shall be opened and read aloud with the corresponding Tender and recorded.

44.7 Ensuring that only the correct (M), (S), (A), (O) envelopes are opened, details of each Tender will be dealt with as follows:

- (a) the Chairperson of the Tender Opening Committee will read aloud each Tender and record in the Tender Opening Sheet (TOS) :
 - (i) the name and address of the Tenderer;
 - (ii) state if it is a withdrawn, modified, substituted or original Tender;
 - (iii) the Tender price;
 - (iv) the number of initialled corrections;
 - (v) any discounts;
 - (vi) any alternatives;

- (vii) the presence or absence of any requisite Tender Security; and
 - (viii) such other details as the Employer, at its discretion, may consider appropriate.
 - (b) only discounts and alternatives read aloud at the Tender opening will be considered in evaluation.
 - (c) all pages of the original version of the Tender, except for un-amended printed literature, will be initialised by members of the Tender Opening Committee.
- 44.8 Upon completion of Tender opening, all members of the Tender Opening Committee and the Tenderers or Tenderer's duly authorised representatives attending the Tender opening shall sign by name, address, designation and their national Identification Numbers the Tender Opening Sheet, copies of which shall be issued to the Head of the Procuring Entity or an officer authorised by him or her and also to the members of the Tender Opening Committee and any authorised Consultants and, to the Tenderers immediately.
- 44.9 The omission of a Tenderer's signature on the record shall not invalidate the contents and effect of the record under ITT Sub Clause 44.7.
- 44.10 No Tender will be considered non-responsive at the Tender opening stage except the LATE Tenders.
- 45.Evaluation of Tenders**
- 45.1 Tenders shall be examined and evaluated only on the basis of the criteria specified in the Tender Document.
- 45.2 The Employer's **Tender Evaluation Committee (TEC)** shall examine, evaluate and compare Tenders that are responsive to the mandatory requirements of Tender Documents in order to identify the successful Tenderer.
- 46.Evaluation Process**
- 46.1 The TEC may consider a Tender as responsive in the Evaluation, only if it is submitted in compliance with the mandatory requirements set out in the Tender Document. The evaluation process should begin immediately after tender opening following four broad steps:
- (a) Preliminary examination
 - (b) Technical examination and responsiveness
 - (c) Financial evaluation and price comparison
 - (d) Post-qualification of the lowest evaluated responsive Tender.
- 47.Preliminary Examination**
- 47.1 Firstly, compliance, adequacy and authenticity of the documentary evidences for meeting the eligibility and qualification criterion specified in the corresponding Sections of the Tender Document shall be preliminarily examined.
- 47.2 Examination of the compliance, adequacy and authenticity of the documentary evidence may follow the order below:

- (a) verification of the completeness of the eligibility declarations in the Tender Submission Sheet (**Form PW5-1**) as furnished in **Section 5: Tender and Contract Forms**;
- (b) verification of the completeness of the Tenderer Information (**Form PW5-2**) as furnished in **Section 5: Tender and Contract Forms**;
- (c) verification of the completeness of the JV Partner Information (**Form PW5-3**) as furnished in **Section 5: Tender and Contract Forms**;
- (d) verification of the completeness of the Specialist Subcontractor Information (**Form PW5-4**) as furnished in **Section 5: Tender and Contract Forms**;
- (e) verification of that the Tenderer's country of origin is not ineligible;
- (f) verification of that the Tenderer is enrolled in the relevant professional or trade organisations registered in the country of its origin;
- (g) verification of that the written authorisation confirming the signatory of the Tenderer to commit the Tender has been attached with the Tender Submission Letter (**Form PW5-1**) as stated under ITT Sub Clause 36.3; in order to check the authenticity of Tender and Tenderer itself;
- (h) verification of the eligibility in terms of legal capacity and fulfilment of taxation obligations by the Tenderer;
- (i) verification of that all the documents required, as stated under ITT Clause 28 for a Tender, has been provided and requirements met by a Tender;
- (j) verification of that all the documents required, as stated under ITT Clause 13 and ITT Clause 25 for a Joint Venture Tender, has been provided and requirements met, if it is a joint venture Tender;
- (k) verification of that the Tenderer is not insolvent, in receivership, bankrupt, in the process of bankruptcy or temporarily barred;
- (l) verification of that the written notice for substitution of or modification to, the corresponding Tender is proper and authentic, if the Tender is "WITHDRAWN" "SUBSTITUTION" or "MODIFICATION", in accordance with ITT Clause 40;
- (m) verification of the status of claims, arbitration and other litigation cases of the Tenderer as stated under ITT Clause 5 and ITT Clause 25;
- (n) verification of the validity and authenticity of the Tender Security in the form of Bank Guarantee using the standard format (**Form PW5-6**) furnished in **Section 5: Tender and Contract Forms**, issued by an internationally reputable Bank which has a correspondent Bank located in Bangladesh as attached with the Tender Submission Letter (**Form PW5-1**), in order to check the compliance of

the instructions as stated under ITT Clauses 30,31,32 and 33;

48. Technical Examination and Responsiveness

- 48.1 Secondly, the TEC will examine the adequacy and authenticity of the documentary evidence which may follow the order below.
- 48.2 The TEC will evaluate the technical aspects of the Tender submitted as stated under ITT Clauses 25, 26 and 27, to confirm that all mandatory requirements have been met.
- 48.3 The TEC will further examine the terms and conditions specified in **Section 7: General Specifications** and **Section 8: Particular Specifications** of the Tender Document have been met without any material deviation or reservation.
- 48.4 The TEC's determination of a Tender's responsiveness is to be based on the documentary evidence as stated under ITT Clause 20 without recourse to extrinsic evidence.
- 48.5 Information contained in a Tender submission that was not requested in the Tender Document shall not be considered in evaluation of the Tender.
- 48.6 A Tender shall be considered responsive in the evaluation, only when it is submitted in compliance with the mandatory requirements set out in the Tender Document without material deviation or reservation.
- 48.7 If, after the examination of the terms and conditions and the technical aspects of the Tender, the TEC determines that the Tender is not responsive in accordance with ITT Clause 20, it shall consider the Tender non-responsive.
- 48.8 If a Tender is not responsive to the mandatory requirements set out in the Tender Document, it shall be considered non-responsive by the TEC and will not subsequently be made responsive by correction of the material deviation or reservation.
- 48.9 A material deviation or reservation is one that:
- (a) affects in any substantial way the scope, quality, or performance of the Works; or
 - (b) limits in any substantial way, or is inconsistent with the Tender Document, the Employer's rights or the Tenderer's obligations under the Contract; or
 - (c) if rectified would unfairly affect the competitive position of other Tenderers presenting responsive Tenders.

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

"Deviation" is a departure from the requirements set out in the Tender Document;

"Reservation" is the setting of limiting conditions or withholding from complete acceptance of the mandatory requirements set out in the Tender Document]

48.10 The TEC may regard a Tender as responsive even if it contains;

- (a) minor or insignificant deviations which do not meaningfully alter or depart from the technical specifications, characteristics and commercial terms and, conditions or other mandatory requirements set out in the Tender Document; or
- (b) errors or oversights that if corrected, would not alter the key aspects of the Tender.

49. Clarification on Tender

49.1 The TEC may ask Tenderers for clarification of their Tenders, including breakdowns of unit rates or prices, in order to facilitate the examination and evaluation of Tenders. The request for clarification by the TEC and the response from the Tenderer shall be in writing, and Tender clarifications which may lead to a change in the substance of the Tender or in any of the key elements of the Tender pursuant to ITT Sub Clause 48.9, will neither be sought nor be permitted.

49.2 Changes in the Tender price shall also not be sought or permitted, except to confirm the correction of arithmetical errors discovered by the TEC in the evaluation of the Tenders, as stated under ITT Sub Clause 51.1.

49.3 Any request for clarifications by the TEC shall not be directed towards making an apparently non-responsive Tender responsive and reciprocally the response from the concerned Tenderer shall not be articulated towards any addition, alteration or modification to its Tender.

49.4 If a Tenderer does not provide clarifications of its Tender by the date and time set in the TEC's written request for clarification, its Tender shall not be considered in the evaluation.

49.5 Requests for clarifications on Tenders shall be duly signed only by the TEC Chairperson.

50. Restrictions on Disclosure of Information Relating to Procurement Process

50.1 Following the opening of Tenders until issuance of Notification of Award no Tenderer shall, unless requested to provide clarification to its Tender or unless necessary for submission of a complaint, communicate with the concerned Employer pursuant to Rule 31 of the Public Procurement Rules, 2008.

50.2 Tenderers shall not seek to influence in anyway, the examination and evaluation of the Tenders.

50.3 Any effort by a Tenderer to influence a Employer in its decision concerning the evaluation of Tenders, Contract awards may result in the consideration its Tender non-responsive as well as further action in accordance with Section 64 (5) of the Public Procurement Act, 2006.

50.4 All clarification requests shall remind Tenderers of the need for confidentiality and that any breach of confidentiality on the part

of the Tenderer may result in their Tender being disqualified.

**51. Correction of
Arithmetical
Errors**

51.1 Provided that the Tender is responsive, the TEC shall correct arithmetical errors on the following basis:

- (a) if there is a discrepancy between the unit price and the line item total price that is obtained by multiplying the unit price and quantity, the unit price will prevail and the line item total price shall be corrected, unless in the opinion of the TEC there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted will govern and the unit price will be corrected; and
- (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.

51.2 Any arithmetical error or other discrepancies as stated in ITT Sub Clause 51.1 will be immediately notified by the TEC pursuant to Rule 98 (11) of the Public Procurement Rules, 2008 to the concerned Tenderer for acceptance.

**52. Conversion to
Single Currency**

52.1 For evaluation and comparison purposes, the currency of the Tender shall be converted into Bangladesh Taka currency.

52.2 The exchange rate for conversion, as stated under ITT Sub Clause 52.1, to be used in arriving at the Bangladesh Taka currency equivalent shall be the **selling rate** quoted by the source being Bangladesh Bank **on the date of opening** of the Tenders.

**53. Financial
Evaluation**

53.1 Thirdly the TEC will evaluate each Tender that has been determined, up to this stage of the evaluation, to be responsive to the mandatory requirements set out in the Tender Document.

53.2 To evaluate a Tender, the TEC will consider the following:

- (a) the Tender price, excluding Provisional Sums and the provision, if any, for contingencies in the priced Bill of Quantities, but including Daywork items, where priced competitively;
- (b) adjustments for correction of arithmetical errors pursuant to ITT Sub Clause 51.1;
- (c) adjustments in order to take into consideration the unconditional discounts or methodology for application of the discount offered pursuant to ITT Sub Clause 23.7;
- (d) adjustments by converting the amount resulting from (a), (b), and (c) above, if relevant, to Bangladesh Taka currency, as stated under ITT Sub Clause 52;

- (e) adjustments for any other acceptable variations or deviations pursuant to ITT Sub Clause 48.10.

- 53.3 Variations, deviations, alternatives and other factors which are in excess of the requirements of the Tender Document or otherwise result in unsolicited benefits for the Employer will not be taken into account in Tender evaluation.
- 53.4 The estimated effect of any **price adjustment** provisions under GCC Clause 74, applied over the period of execution of the Contract, will not be taken into account in Tender evaluation.
- 53.5 If so indicated in the ITT Sub Clause 23.7 the Employer may award one or multiple lots to one Tenderer following the methodology specified in ITT Sub Clause 53.6.
- 53.6 To determine the lowest-evaluated lot or combination of lots, the TEC will take into account:
 - (a) the experience and resources sufficient to meet the aggregate of the qualifying criteria for the individual lot;
 - (b) the lowest-evaluated Tender for each lot calculated in accordance with all the requirements of Evaluation Criteria;
 - (c) the price reduction on account of discount per lot or combination of lots and the methodology for application of the discount as offered by the Tenderer in its Tender; and
 - (d) the Contract-award sequence that provides the optimum economic combination on the basis of least overall cost of the total Contract package taking into account any limitations due to constraints in Works or execution capacity determined in accordance with the post-qualification criteria stated under ITT Clause 56.
- 53.7 If the lowest Evaluated Tender is significantly below the official estimated cost or unbalanced as a result of front loading in the opinion of the TEC, the TEC may require the Tenderer to produce detailed breakdown of unit price or rates for any or all items of the BOQ, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the breakdown of the unit price or rates, taking into consideration the schedule of estimated Contract payments, the Employer may require that the amount of the Performance Security set forth in ITT Sub Clause 61.2 be increased at the expenses of the Tenderer to a level as stated under ITT Sub Clause 61.3 sufficient to protect the Employer against financial loss in the event of default by such Tenderer during Contract implementation, if awarded the Contract.

54.Price Comparison

- 54.1 The TEC will compare all responsive Tenders to determine the lowest-evaluated Tender, in accordance with ITT Clause 53.

- 54.2 The TEC shall apply percent margin of preference for national Tenderer, if applicable, as stated under ITT Sub Clause 15.3; only for ranking.
- 54.3 For the purpose of **comparison** of the Tenders only, the margin of '**domestic preference**' shall be applied following the procedures as stated under ITT Sub Clause 54.4, 54.5 and 54.6.
- 54.4 The responsive Tenders shall be classified into following groups:
- (i) **Group A** shall include all Tenders offered by national Tenderers and JV, which meet the requirements stated under ITT Sub Clause 15.2; and
 - (ii) **Group B** shall include all other Tenders.
- 54.5 For the purpose of **ranking** the Tenders only, the respective evaluated Tender prices of all Tenders placed in Group B shall be increased by the percentage for '**domestic preference**', as stated under ITT Sub Clause 15.3, after having adjusted arithmetical errors or other discrepancies and having excluded '**provisional sums**' and provision, if any, for contingencies within the Tender price, but including Day Work.
- 54.6 The lowest evaluated priced Tenders in **Groups A** and **B** shall then be compared, and that lowest evaluated Tender shall be recommended for award.
- 54.7 In the extremely unlikely event that there is a tie for the lowest evaluated price, the Tenderer with the superior past performance with the Employer shall be selected, whereby factors such as delivery period, quality of Works delivered, complaints history and performance indicators could be taken into consideration.
- 54.8 In the event that there is a tie for the lowest price and none of the Tenderers has the record of past performance with the Employer as stated under ITT Sub Clause 54.7, then the Tenderer shall be selected, subject to firm confirmation through the Post-qualification process, after consideration as to whether the Tenderer has demonstrated in its Tender superior past performance with the other Procuring Entities or a more efficient work programme and work methodology.
- 54.9 The successful Tenderer as stated under ITT Sub Clauses 54.1, 54.7 and 54.8 shall not be selected through lottery under any circumstances.

55. Negotiations

- 55.1 No negotiations shall be held during the Tender evaluation or award with the lowest or any other Tenderer.
- 55.2 The Employer through the TEC may, however, negotiate with the lowest evaluated Tenderer with the objective to reduce the Contract price by reducing the scope of works or a

reallocation of risks and responsibilities, only when it is found that the lowest evaluated Tender is significantly higher than the official estimated cost; the reasons for such higher price being duly investigated.

55.3 If the Employer decides to negotiate for reducing the scope of the requirements under ITT Sub Clause 55.2, it will be required to guarantee that the lowest Tenderer remains the lowest Tenderer even after the scope of work has been revised and shall further be ensured that the objective of the Procurement will not be seriously affected through this reduction.

55.4 In the event that the Employer decides because of a high Tender price to reduce the scope of the requirements to meet the available budget, the Tenderer is not obliged to accept the award and shall not be penalised in any way for un-accepting the proposed award.

56.Post-qualification

56.1 After determining the lowest evaluated responsive Tender in accordance with ITT Clause 55, the Employer's TEC shall carry out the Post-qualification of the Tenderer, using only the requirements specified in **Sub-section C: Qualification Criteria**.

56.2 The TEC shall contact the references given by Tenderers about their previous working experience to verify, if necessary, statements made by them in their Tender and to obtain the most up-to-date information available concerning the Tenderers.

56.3 The TEC may visit the premises of the Tenderer as a part of the qualification process, if practical and appropriate, to verify information contained in its Tender particularly when evaluating Tenders in respect of high value or complex Works projects.

56.4 The objective of any visit under IITT Sub Clause 56.3 shall be limited to a general and visual inspection of the Tenderer's facilities and its plant and equipment, and there shall be no discussion concerning the Tender or its evaluation with the Tenderer during such visit(s).

56.5 In the event that the Tenderer with lowest evaluated Tender price fails the post-qualification, the TEC shall make a similar determination for the Tenderer offering the next lowest evaluated Tender price and so on from the remaining responsive Tenders, provided that,

- (a) such action shall only be taken if the evaluated costs of the Tenders under consideration are acceptable to the Employer;
- (b) when the point is reached whereby the evaluated costs of the remaining responsive Tenders are significantly higher than that of the official estimate, or the market price, the Employer proceed for re-Tendering, using a revised Tender Document, where necessary, designed to achieve a more successful result.

**57. Rejection of
All Tenders**

- 57.1 The Employer may, in the circumstances as stated under ITT Sub Clause 57.2 , reject all Tenders following recommendations from the Tender Evaluation Committee (TEC) only after the approval of such recommendations by the Head of the Procuring Entity.
- 57.2 All Tenders can be rejected, if -
- (a) the price of the lowest evaluated Tender substantially exceeds the official estimate, provided the estimate is realistic;
 - or
 - (b) there is evidence of lack of effective competition; such as non-participation by a number of pre-qualified Tenderers;
 - or
 - (c) the Tenderers are unable to offer the required completion time, provided the stipulated completion time is reasonable and realistic;
 - or
 - (d) Tenders are not responsive;
 - or
 - (e) evidence of professional misconduct, affecting seriously the Procurement process, is established as per Chapter Seven of the Public Procurement Rules, 2008.
- 57.3 Notwithstanding anything contained in ITT Sub Clause 57.2(a), Tenders may not be rejected if the lowest evaluated price is in conformity with the market price.
- 57.4 The Employer, on justifiable grounds, may annul the Procurement proceedings with prior approval of the Head of the Procuring Entity, any time prior to the deadline for submission of Tenders following specified procedures.
- 57.5 All Tenders received by the Employer shall be returned unopened to the Tenderers in the event Procurement proceedings are annulled under ITT Sub Clause 57.4.
- 57.6 The Employer, on justifiable grounds, may further annul the Procurement proceedings, any time prior to the issuance of NOA following specified procedures.

**58. Informing
Reasons for
Rejection**

- 58.1 Notice of the rejection will be given promptly within seven (7) days of decision taken by the Employer to all Tenderers and, the Employer will, upon receipt of a written request, communicate to any Tenderer the reason(s) for its rejection but is not required to justify those reason(s).

G. Contract Award

- 59. Award Criteria**
- 59.1 The Employer shall award the Contract to the Tenderer whose offer is responsive to all the requirements of the Tender Document and that has been determined to be the lowest evaluated Tender, provided further that the Tenderer is determined to be Post-qualified in accordance with ITT Clause 56.
- 59.2 The Tenderer will not be required, as a condition for award, to undertake responsibilities not stipulated in the Tender documents, to change its price, or otherwise to modify its Tender.
- 60. Notification of Award**
- 60.1 Prior to the expiry of the Tender Validity period and within seven (7) working days of receipt of the approval of the award by the Approving Authority, the Employer shall issue the Notification of Award (NOA) to the successful Tenderer.
- 60.2 The Notification of Award, attaching the contract as per the sample (**Form PW5-7**) to be signed, shall state :
- (a) the acceptance of the Tender by the Employer;
 - (b) the price at which the contract is awarded;
 - (c) the amount of the Performance Security and its format;
 - (d) the date and time within which the Performance Security shall be submitted; and
 - (e) the date and time within which the Contract shall be signed.
- 60.3 The Notification of Award shall be accepted in writing by the successful Tenderer within seven (7) working days from date of issuance of the Notification of Award.
- 60.4 Until a formal contract is signed, the Notification of Award will constitute a Contract, which shall become binding upon the furnishing of a Performance Security and the signing of the Contract by both parties.
- 60.5 The Notification of Award establishes a Contract between the Employer and the successful Tenderer and the existence of a Contract is confirmed through the signature of the Contract Document that includes all agreements between the Employer and the successful Tenderer.
- 61. Performance Security**
- 61.1 The Performance Security shall be determined sufficient to protect the performance of the Contract.
- 61.2 The Performance Security shall be provided by the successful Tenderer in the currency of USD or GBP or EUR or JPY and/or Bangladesh Taka, as stated under ITT Sub Clauses 24.1 and 24.2, at the percentage as specified in the TDS.
- 61.3 The Employer may increase the amount of the Performance

Security above the amounts as stated under ITT Sub Clause 61.2 but not exceeding twenty five (25) percent of the Contract price, if it is found that the Tender is significantly below the official estimated cost or unbalanced as a result of front loading as stated under ITT Sub Clause 53.7.

61.4 The proceeds of the Performance Security shall be payable to the Employer unconditionally upon first written demand as compensation for any loss resulting from the Contractor's failure to complete its obligations under the Contract.

62. Form and Time Limit for Furnishing of Performance Security

62.1 The Performance Security, as stated under ITT Clause 61, shall be in the form of an irrevocable Bank Guarantee issued by an internationally reputable Bank which has a correspondent Bank located in Bangladesh, in the format **(Form PW5-9)**, acceptable to the Employer.

62.2 Within twenty eight **(28)** days of issuance of the Notification of Award (NOA) but not later than the date specified therein, the successful Tenderer shall furnish the Performance Security for the due performance of the Contract in the amount as stated under ITT Sub Clauses 61.2 or 61.3.

63. Validity of Performance Security

63.1 The Performance Security shall be required to be valid until a date twenty eight **(28)** days beyond the Intended Completion Date as specified in Tender Document.

63.2 If under any circumstances the Intended Completion Date is to be extended, the Performance Security shall correspondingly be extended for the same period until twenty eight **(28)** days from the new Intended Completion Date.

63.3 The amount of the Performance Security as stated under ITT Sub Clauses 61.2 and 61.3 and further its validity as stated under ITT Sub Clauses 63.1 and 63.2 shall be reset to cover the Defects Liability Period in accordance with the provisions laid down in GCC Clause 79.

64. Authenticity of Performance Security

64.1 The Employer shall verify the authenticity of the Performance Security submitted by the successful Tenderer by sending a written request to the branch of the Bank issuing the irrevocable Bank Guarantee in specified format and, to its correspondent Bank located in Bangladesh, as and where applicable.

64.2 If the Performance Security submitted under ITT Sub Clause 64.1 is not found to be authentic, the Employer shall proceed to take measures against the Tenderer in accordance with Section 64 of the Act and pursuant to Rule 127 of the Public Procurement Rules, 2008.

65. Contract Signing

65.1 At the same time as the Employer issues the Notification of Award (NOA), the Employer will send the draft Contract Agreement and all documents forming the Contract to the successful Tenderer.

- 65.2 Within twenty-eight (28) days of issuance of the NOA, the successful Tenderer and the Employer shall sign the contract provided that the Performance Security submitted by the Tenderer is found to be genuine.
- 65.3 If the successful Tenderer fails to provide the required Performance Security, pursuant to ITT Clause 61 or to sign the Contract, pursuant to ITT Sub Clause 65.2, Employer shall proceed to award the Contract to the next lowest evaluated Tenderer, and so on, by order of ranking.
- 66.Publication of Notification of Award of Contract**
- 66.1 Notification of Award for Contract shall be notified by the Employer to the Central Procurement Technical Unit within seven (7) days of issuance of the NOA for publication in their website, and that notice shall be kept posted for not less than a month.
- 67.Debriefing of Tenderers**
- 67.1 Debriefing of Tenderers by Employer shall outline the relative status and weakness only of his or her Tender requesting to be informed of the grounds for not accepting the Tender submitted by him or her without disclosing information about any other Tenderer.
- 67.2 In the case of debriefing, confidentiality of the evaluation process shall be maintained.
- 68.Right to Complain**
- 68.1 Any Tenderer has the right to complain if it has suffered or likely to suffer loss or damage due to a failure of a duty imposed on the Employer to fulfil its obligations in accordance with Section 29 of the Public Procurement Act 2006 and Part 12 of Chapter Three of the Public Procurement Rules, 2008.
- 68.2 Circumstances in which a formal complaint may be lodged in sequence by a pre-qualified Tenderer against a Employer pursuant to Rule 56 of the Public Procurement Rules, 2008, and the complaints, if any, be also processed pursuant to Rule 57 of the Public Procurement Rules 2008.
- 68.3 The pre-qualified Tenderer shall submit his or her complaint in writing within seven (7) calendar days of becoming aware of the circumstances giving rise to the complaint.
- 68.4 In the first instance, the pre-qualified Tenderer shall submit his or her complaint to the Employer who issued the Tender Document.
- 68.5 The place and address for the first stage in the submission of complaints to the administrative authority is provided in the TDS.
- 68.6 A Tenderer may appeal to a Review Panel only when that Tenderer has exhausted all his or her options of complaints to the administrative authority as stated under ITT Sub Clause 68.2

Section 2. Tender Data Sheet

Instructions for completing Tender Data Sheet are provided in italics in parenthesis for the relevant ITT clauses

ITT Clause	Amendments of, and Supplements to, Clauses in the Instructions to Tenderers
A. General	
ITT 1.1	The Employer is Bangladesh Water Development Board represented by Project Director, Project Management Unit (PMU), Capital (Pilot) Dredging of the River System in Bangladesh (CDRSB), BWDB, Dhaka The Name of the Tender is: Protective Work Of 4(Four) Nos. Cross Bar/Closure Constructed By Dredged Spoil and Adjacent Area (Reclaimed Land) At Uzazila: Sirajganj Sadar, District: Sirajganj Brief Description of the Works: The Jamuna River a large braded river is the most complex and dynamic in the world. The river originates from China and after travelling several thousands kilometres through China and India enter into Bangladesh from north. Within the territory of Bangladesh, the length of the Jamuna River varies from 240 km along its right bank to 220 km along its left bank. The Jamuna transports more than half a billion tons of sediment per year. Due to carrying of huge sediment loads with low gradient, rapidly alternating channels and sand bars (chars) as well as river bed siltation/ aggradations is most pronounced. The continuously changing of riverbed has a serious socio-economic impact in Bangladesh since the economy is largely dependent on land and water management. In recent years the frequency of devastating floods has increased substantially causing serious damages to infrastructure, life and livelihood of both rural and urban communities. In order to reduce the risk of river bank erosion, flooding and improvement of navigability, dredging of rivers in planned way has been considered to be an effective measure. So, as a pilot case , Capital (Pilot) Dredging of Jamuna River from upstream of Sirajganj Hard Point to downstream of Bangabandhu Bridge up to Offtake of Daleswari River (20 Km) for streamlining the river flow through defined section and thereby to reduce the risk of bank erosion and disasters was taken up during 2011-2012 followed by maintenance dredging during 2012-2013. Simultaneously, 4(four) Nos Cross Bar were constructed with the dredged sludge. Construction of the Cross Bars has facilitated in reclamation of about 16 square kilometre of valuable land at Upazila: Sirajgonj Sadar, Dist: Sirajgonj and it has created avenue for development of housing settlement, business centre, industrial park, tourist spot, farming etc. in the reclaimed land. However, the Cross-Bars have been being threatened by the on rush of Jamuna River during flood and it has become major concern of the government to protect the Cross Bars and the reclaimed land. So, the proposed Protective Work is aimed at setting aside the Cross Bars from grasp of mighty Jamuna River and thereby protects the reclaimed land. Tender Ref: PD/PMU-CDRSB/T-7/121, Dated 04 February, 2014 Lot No(s): None

ITT 3.1	The source of public funds is GoB
ITT 3.3	The name of the Development Partner is None
ITT 6.1	Materials, Equipments and associated services from the following countries are not eligible: Israel
B. Tender Document	
ITT 8.2	The following are authorised agents of the Employer for the purpose of issuing the Tender Document: None Tender Document will be issued directly from the Office of the Project Director, PMU, CDRSB, BWDB, Dhaka at following Address; Address: 72 Green Road, Dhaka-1215 Telephone: 88-02-9137504, Mobile: 01712175262 Fax No.: 88-02-9125502 e-mail address: pmucapdredging@gmail.com on furnishing a request letter by the Prequalified Firm/JVCA addressed to PD, PMU, CDRSB, BWDB, Dhaka accompanied by a Demand Draft/Pay Order amounting BDT 10,000/00 or equivalent US\$ 130.00 in form of Bank Draft/ Pay Order issued from any scheduled Bank of Bangladesh favouring Account Officer, RAC, BWDB, 72 Green Road, Dhaka.
ITT 9.1	For <u>clarification of Tender Document purposes</u> only, the Employer's address is: Project Director, Project Management Unit (PMU) Capital(Pilot) Dredging of the River System in Bangladesh Address: 72 Green Road, Dhaka-1215 Telephone: 88-02-9137504, Mobile: 01712175262 Fax No.: 88-02-9125502 e-mail address: pmucapdredging@gmail.com
ITT 10.1	A Pre- Tender meeting shall be held at Address: BWDB's Conference Room, WAPDA BHABAN (3rd floor), Motijheel C/A, Dhaka Time & Date: at 1100 hrs on 04/03/2014
C. Qualification Criteria	
ITT 14.4	The Nominated Subcontractor(s) named [insert name(s)] shall execute the following specific components of the proposed Works: None

ITT 15.1	Domestic Preference shall not be applicable for eligible national Tenderers
D. Tender Preparation	
ITT 20.1(k)	The Tenderer shall submit with its Tender the following additional documents: None
ITT 22.1	Alternatives will not be permitted.
ITT 22.2	There shall not be alternative times for completion of the Works.
ITT 22.4	Alternative technical solutions for any parts of works will not be permitted.
ITT 23.7	Tenders are being invited for an individual lot.
ITT 23.10	The prices quoted by the Tenderer shall be fixed for the duration of the Contract.
ITT 24.1	The currency of the Tender shall be Bangladeshi Taka
ITT 24.4	The currency of the payments shall be Bangladeshi Taka
ITT 27.1	The required Technical Proposal shall include the following additional information: a. Setting up office/camps at site , mobilisation of manpower/ equipment at site etc b. Methodology how the Contractor intends to carry out the work within the stipulate time c. Work plan for manufacturing of C.C Blocks and Procurement of Hard Rock d. Methodology of development of launching Apron following design and specifications e. Methodology and Work Plan for Construction of Bituminous Carpeting Road f. List of Manpower/equipment etc proposed to deploy for the specified work g. Ensure safety measures at site h. Demobilisation of sites
ITT 29.2	The Tender Validity period shall be 120 days.

ITT 31.2	The amount of the Tender Security shall be BDT 57,200,000.00 (Bangladeshi Taka Fifty Seven Million Two Hundred Thousand) or US\$ 738,000.00 (United State Dollar Seven Hundred Thirty Eight Thousand) in favour of Account Officer, RAC, BWDB,72 Green Road, Dhaka
ITT 36.1	In addition to the original of the Tender, 2(two) copies shall be submitted.
E. Tender Submission	
ITT 37.2(e)	The inner and outer envelopes shall bear the following additional identification marks: Tender Package Number
ITT 38.1	For <u>Tender submission purposes</u> only, the Employer's address is: Attention: Project Director, Project Management Unit (PMU) Capital(Pilot) Dredging of the River System in Bangladesh Address: 72 Green Road, Dhaka-1215 Telephone: 88-02-9137504, Mobile: 01712175262 Fax No.: 88-02-9125502 e-mail address: pmucapdredging@gmail.com The deadline for the submission of Tenders is: Time & Date: 1200 hrs up to 20/03/2014.
ITT 38.3	For <u>Tender submission purposes</u> only, the Employer's address is: Not applicable
ITT 38.4	The deadline for the hand-delivering of the Tenders at the PRIMARY PLACE is: Time & Date: Not applicable
F. Tender Opening and Evaluation	
ITT 44.2	The Tender opening shall take place at: Address: Office of the Project Director, Project Management Unit (PMU) Capital(Pilot) Dredging of the River System in Bangladesh 72 Green Road, Dhaka-1215 Time & Date: At 1400 hrs on 20/03/2014

G. Contract Award	
ITT 61.2	The amount of Performance Security shall be 10 (ten) percent of the Contract price in the currency of Bangladeshi Taka or equivalent United State Dollar <u>The Performance Security shall be increased to Maximum twenty five (25) percent of the total Contract price in case the Tender is significantly below the official estimated cost or unbalanced as a result of front loading]</u>
ITT 68.5	The name and address of the office where complaints to the Employer under Rule 57 are to be submitted is: Name: Project Director Address: Office of the Project Director, Project Management Unit (PMU), Capital(Pilot) Dredging of the River System in Bangladesh (CDRSB) BWDB, 72 Green Road, Dhaka-1215 Fax No.: 88-02-9125502 e-mail address: pmucapdredging@gmail.com

Section 3. General Conditions of Contract

A. General

1. Definitions

1.1 In the Conditions of Contract, which include Particular Conditions and these General Conditions, the following words and expressions shall have the meaning hereby assigned to them. Boldface type is used to identify the defined terms:

- (a) **Approving Authority** means the authority which, in accordance with the Delegation of Financial powers, approves the award of Contract for the Procurement of Goods, Works and Services.
- (b) **Act means** The Public Procurement Act, 2006 (Act 24 of 2006).
- (c) **Adjudicator** is the expert appointed jointly by the Employer and the Contractor to resolve disputes in the first instance, as provided for in GCC Sub Clause 100.2.
- (d) **Bill of Quantities (BOQ)** means the priced and completed Bill of Quantities forming part of the Contract defined in GCC Clause 63.
- (e) **Compensation Events** are those defined in GCC Clause 72.
- (f) **Competent Authority** means the authority that gives decision on specific issues as per delegation of administrative and/or financial powers.
- (g) **Completion Certificate** means the Certificate issued by the Engineer as evidence that the Contractor has executed the Works and Physical services in all respects as per design, drawing, specifications and Conditions of Contract.
- (h) **Completion Date** is the actual date of completion of the Works and Physical services certified by the Engineer, in accordance with GCC Clause 83.
- (i) **Contract** means the Contract Agreement, the Notification of Award, Tender Submission Letter, these Conditions, the Specification, the Drawings, the Schedules, the Priced Bill of Quantities, and the further Documents (if any) which are listed in the Contract Agreement or in the Notification of Award.
- (j) **Contract Agreement** means the Agreement entered into between the Employer and the Contractor, together with the Contract Documents referred to therein, including all attachments, appendices, and all documents incorporated by reference therein to execute, complete, and maintain the Works.
- (k) **Contract Documents** means the documents listed in GCC Clause 6, including any amendments thereto.
- (l) **Contractor** means the Person under contract with the

Employer for the execution of Works under the Rules and the Act as stated in the PCC.

- (m) **Contract Price** is the price stated in the Notification of Award (**FormPW5-7**) and as specified in the GCC Sub Clause 62.1 and, thereafter as adjusted in accordance with the provisions of the Contract.
- (n) **Contractor's Tender** is the completed Tender Document including the priced Bill of Quantities and the Schedules submitted by the Contractor to the Employer.
- (o) **Cost** means all expenditures reasonably incurred or to be incurred by the Contractor, whether on or off the Site, including overhead ,profit, taxes, duties, fees, and such other similar levies.
- (p) **Day** means calendar day unless otherwise specified as working days.
- (q) **Dayworks** means work carried out following the instructions of the Employer or the authorised Engineer and is paid for on the basis of time spent by the Contractor's workers and equipment at the rates specified in the Schedules, in addition to payments for associated Materials and Plant.
- (r) **Defect** is any part of the Works not completed in accordance with the Contract.
- (s) **Defects Correction Certificate** is the certificate issued by the Engineer upon correction of defects by the Contractor.
- (t) **Defects Liability Period** is the period specified in the PCC and calculated from the Completion Date.
- (u) **Drawings** include calculations and other information provided in Section 9 or as approved by the Engineer for the execution and completion of the Contract.
- (v) **Employer (Procuring Entity)** means a Employer having administrative and financial powers to undertake procurement of Works and Physical services using public funds and is as named in the PCC who employs the Contractor to carry out the Works.
- (w) **Engineer** is the person named in the PCC or any other competent person appointed by the Employer and notified to the Contractor who is responsible for supervising the execution and completion of the Works and Physical services and administering the Contract.
- (x) **Equipment** is the Contractor's apparatus, machinery, vehicles and other things required for the execution and completion of the Works and remedying any defects excluding Temporary Works and the Employer's Equipment (if any), Plant, Materials and any other things to form or forming part of the Permanent Works.
- (y) **Force Majeure** means an event or situation beyond the control of the Contractor that is not foreseeable, is unavoidable, and its origins not due to negligence or lack

of care on the part of the Contractor; such events may include, but not be limited to, acts of the Government in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes or more as included in GCC Clause 88.;

- (z) **GCC** means the General Conditions of Contract.
- (aa) **Government** means the Government of the People's Republic of Bangladesh.
- (bb) **Goods** mean the Contractor's Equipment, Materials, Plant and Temporary Works, or any of them as appropriate.
- (cc) **"Head of the Procuring Entity"** means the Secretary of a Ministry or a Division, the Head of a Government Department or Directorate; or the Chief Executive, by whatever designation called, of a local Government agency, an autonomous or semi-autonomous body or a corporation, or a corporate body established under the Companies Act;
- (dd) **Intended Completion Date** is the date calculated from the Commencement Date as specified in the PCC, on which it is intended that the Contractor shall complete the Works and Physical services as specified in the Contract and may be revised only by the Engineer by issuing an extension of time or an acceleration order.
- (ee) **Materials** means things of all kinds other than Plant intended to form or forming part of the Permanent Works, including the supply-only materials, if any, to be supplied by the Contractor under the Contract.
- (ff) **Month** means calendar month.
- (gg) **Original Contract Price** is the Contract Price stated in the Employer's Notification of Award and further clearly determined in the PCC.
- (hh) **Permanent works** means the permanent works to be executed by the Contractor under the Contract.
- (ii) **PCC** means the Particular Conditions of Contract.
- (jj) **Plant** means the apparatus, machinery and other equipment intended to form or forming part of the Permanent Works, including vehicles purchased for the Employer and relating to the construction of the Works and Physical services.
- (kk) **Provisional Sums means** amounts of money specified by the Employer in the Bill of Quantities which shall be used, at its discretion, for payments to Nominated Subcontractor(s) and for meeting other essential expenditures under the Contract pursuant to GCC Sub Clause 80.
- (ll) **Retention Money** means the accumulated retention moneys which the Employer retains under GCC Clause 75.

- (mm) **Schedules** means the document(s) entitled schedules, completed by the Contractor and submitted with the Tender Submission Letter, as included in the Contract. Such document may include the data, lists and schedules of rates and/or prices.
- (nn) **Site** means the places where the Permanent Works are to be executed including storage and working areas and to which Plant and Materials are to be delivered, and any other places as may be specified in the PCC as forming part of the Site.
- (oo) **Site Investigation Reports** are those that were included in the Tender Document and are factual and interpretative reports about the surface and subsurface conditions at the Site.
- (pp) **Specification** means the Specification of the Works included in the Contract and any modifications or additions to the specifications made or approved by the Engineer in accordance with the Contract.
- (qq) **Start Date** is the date defined in the PCC and it is the last date when the Contractor shall commence execution of the Works under the Contract.
- (rr) **Subcontractor** means 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.
- (ss) **Taking-Over** means a certificate issued by the Employer under GCC Clause 84.
- (tt) **Temporary Works** means all temporary works of every kind other than Contractor's Equipment required on the Site for the execution and completion of the Permanent Works and remedying of any defects.
- (uu) **Variation** means any change to the Works directly procured from the original Contractor under some specific conditions and circumstances following approved procedures, which is instructed as a Variation under GCC Clause 65 by the Engineer that varies the Works.
- (vv) **Works** means all works associated with the construction, reconstruction, site preparation, demolition, repair, maintenance or renovation of railways, roads, highways, or a building, an infrastructure or structure or an installation or any construction work relating to excavation, installation of equipment and materials, decoration, as well as physical services ancillary to works as detailed in the PCC, if the value of those services does not exceed that of the Works themselves.
- (ww) **Writing** means communication written by hand or machine duly signed and includes properly authenticated messages by facsimile or electronic mail.

2. Interpretation

2.1 In interpreting the GCC, singular also means plural, male also means female or neuter, and the other way around. Headings in the GCC shall not be deemed part thereof or be taken into consideration in the interpretation or construance of the

Contract. Words have their normal meaning under the language of the Contract unless specifically defined.

2.2 Entire Agreement

The Contract constitutes the entire agreement between the Employer and the Contractor and supersedes all communications, negotiations and agreements (whether written or verbal) of parties with respect thereto made prior to the date of Contract Agreement; except those stated under GCC Sub Clause 6.1(j).

2.3 Non waiver

- (a) Subject to GCC Sub Clause 2.3(b), no relaxation, forbearance, delay, or indulgence by either party in enforcing any of the terms and conditions of the Contract or the granting of time by either party to the other shall prejudice, affect, or restrict the rights of that party under the Contract, neither shall any waiver by either party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.
- (b) Any waiver of a party's rights, powers, or remedies under the Contract must be in writing, dated, and signed by an authorized representative of the party granting such waiver, and must specify the right and the extent to which it is being waived.

2.4 Severability

If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract.

2.5 Sectional completion

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).

3. Communications and Notices

- 3.1 Communications between Parties such as notice, request or consent required or permitted to be given or made by one party to the other pursuant to the Contract shall be in writing to the addresses specified in the PCC.
- 3.2 A notice shall be effective when delivered or on the notice's effective date, whichever is later.
- 3.3 A Party may change its address for notice hereunder by giving the other Party notice of such change to the address.

4. Governing Law

- 4.1 The Contract shall be governed by and interpreted in accordance with the laws of the People's Republic of

Bangladesh.

5. Governing Language

- 5.1 The Contract shall be written in English. All correspondences and documents relating to the Contract may be written in English. Supporting documents and printed literature that are part of the Contract 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 Contract, such translation shall govern.
- 5.2 The Contractor shall bear all costs of translation to the governing language and all risks of the accuracy of such translation.

6. Documents Forming the Contract and Priority of Documents

- 6.1 The following documents forming the Contract shall be interpreted in the following order of priority:
- (a) the signed Contract Agreement (**Form PW5-8**);
 - (b) the Notification of Award (**PW5-7**);
 - (c) the completed Tender and the **Appendix to the Tender**;
 - (d) the Particular Conditions of Contract;
 - (e) the General Conditions of Contract;
 - (f) the Technical Specifications;
 - (g) the General Specifications;
 - (h) the Drawings;
 - (i) the priced Bill of Quantities and the Schedules; and
 - (j) any other document listed in the PCC forming part of the Contract.

7. Contract Agreement

- 7.1 The parties shall enter into a Contract Agreement within twenty eight (28) days from the date of issuance of the Notification of Award (NOA). The costs of stamp duties and similar charges, if any, designated by the applicable law in connection with entry into the Contract Agreement, shall be borne by the Employer.

8. Assignment

- 8.1 Neither the Contractor nor the Employer shall assign, in whole or in part, its obligations under the Contract; except with the Employer's prior written approval.

9. Eligibility

- 9.1 The Contractor and its Subcontractor(s) shall have the nationality of a country other than that specified in the PCC.
- 9.2 All materials, equipment, plant, and supplies used by the Contractor in both permanent and temporary works and services supplied under the Contract shall have their origin in the countries except any specified in the PCC.

10. Gratuities / Agency fees

- 10.1 No fees, gratuities, rebates, gifts, commissions or other payments, other than those included in the Contract, shall be given or received in connection with the procurement process or in the Contract execution.

**11. Confidential
Details**

- 11.1 The Employer and the Contractor shall keep confidential and shall not, without the written consent of the other party hereto, divulge to any third party any documents, data, or other information furnished directly or indirectly by the other party hereto in connection with the Contract, whether such information has been furnished prior to, during or following completion or termination of the Contract. Notwithstanding the above, the Contractor may furnish to its Subcontractor such documents, data, and other information it receives from the Employer to the extent required for the Subcontractor to perform its work under the Contract, in which event the Contractor shall obtain from such Subcontractor an undertaking of confidentiality similar to that imposed on the Contractor under GCC Clause 11.
- 11.2 The Employer shall not use such documents, data, and other information received from the Contractor for any purposes unrelated to the Contract. Similarly, the Contractor shall not use such documents, data, and other information received from the Employer for any purpose other than the design, construction, or other work and services required for the performance of the Contract.
- 11.3 The obligations of a party under GCC Sub Clauses 11.1 and 11.2 above, however, shall not apply to information that: the Employer or Contractor needs to share with institutions participating in the financing of the Contract; now or hereafter enters the public domain through no fault of that party; can be proven to have been possessed by that party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other party; or otherwise lawfully becomes available to that party from a third party that has no obligation of confidentiality.
- 11.4 The above provisions of GCC Clause 11 shall not in any way modify any undertaking of confidentiality given by either of the parties hereto prior to the date of the Contract in respect of the Works or any part thereof.
- 11.5 The provisions of GCC Clause 11 shall survive completion or termination, for whatever reason.

**12. Joint Venture,
Consortium or
Association
(JVCA)**

- 12.1 If the Contractor is a Joint Venture, Consortium, or Association (JVCA),
- (a) each partner of the JV shall be jointly and severally liable for all liabilities and ethical or legal obligations to the Employer for the performance of the Contract;
 - (b) the JV partners shall nominate a representative who shall have the authority to conduct all business including the receipt of payments for and on behalf of all partners of the JV;
 - (c) in the event of a dispute that results in legal action against all partners of the JV, if they are available and if only one partner is available, then that partner alone shall answer on

behalf of all partners and, if the complaint lodged is proven, the penalty shall be applicable on that lone partner as whatever penalty all the partners would have received.

- (d) the JV shall notify the Employer of its composition and legal status which shall not be altered without the prior approval of the Employer.
- (e) alteration of partners shall only be allowed if any of the partners is found to be incompetent or has any serious difficulties which may impact the overall implementation of the Works, whereby the incoming partner shall require to possess qualifications equal to or higher than that of the outgoing partner.
- (f) if any of the partners of JV has been debarred from participating in any procurement activity due to corrupt, fraudulent, collusive or coercive practices, that JV partner shall be altered following provisions under GCC Sub Clause 12.1 (d) and (e), while in case the Leading Partner has been debarred due to the same reasons stated herein the Contract shall be terminated as stated under GCC Sub Clause 95.1(b).

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| 13. Possession of the Site | 13.1 | The Employer shall give possession of the Site or part(s) of the Site, to the Contractor on the date(s) stated in the PCC. If possession of a part of the Site is not given by the date stated in the PCC, the Employer will be deemed to have delayed the start of the relevant activities, and this will be a Compensation Event as stated under GCC Sub Clause 72.1(a). |
| 14. Access to the Site | 14.1 | The Contractor shall allow the Engineer and any person authorised by the Engineer 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. |
| 15. Employer's Responsibilities | 15.1 | The Employer shall pay the Contractor, in consideration of the satisfactory progress of execution and completion of the Works and Physical services, 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 Agreement. |
| | 15.2 | The Employer shall make its best effort to guide and assist the Contractor in obtaining, if required, any permit, licence, and approvals from local public authorities for the purpose of execution of the Works and Physical services under the Contract. |
| 16. Approval of the Contractor's Temporary Works | 16.1 | The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Engineer, who is to approve them, if they comply with the Specifications and Drawings. |
| | 16.2 | The Contractor shall be responsible for design of Temporary Works. |
| | 16.3 | All Drawings prepared by the Contractor for the execution of the Temporary or Permanent Works, are subject to prior |

	approval by the Engineer before their use.
	16.4 The Engineer's approval shall not alter the Contractor's responsibility for design of the Temporary Works.
	16.5 The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required.
17. Contractor's Responsibilities	17.1 The Contractor shall execute and complete the Works and remedy any defects therein in conformity in all respects with the provisions of the Contract Agreement.
18. Taxes and Duties	18.1 The Contractor shall be entirely responsible for all kinds of taxes, duties, fees, levies, and such other charges to be paid under the Applicable Law imposed inside and outside Bangladesh.
19. Contractor's Personnel	19.1 The Contractor shall employ the key personnel named in the Schedule of Key Personnel, as referred to in the PCC, to carry out the functions stated in the Schedule or other personnel approved by the Engineer.
	19.2 The Engineer will approve any proposed replacement of key personnel only if their relevant qualifications and abilities are equal to or higher than those of the personnel named in the Schedule.
	19.3 If the Engineer asks the Contractor to remove a particular person who is a member of the Contractor's staff or work force from the Site, he or she shall state the reasons, and the Contractor shall ensure that the person leaves the Site within three (3) days and has no further connection with the work in the Contract.
20. Subcontracting	20.1 Subcontracting the whole of the Works by the Contractor shall not be permissible. The Contractor shall be responsible for the acts or defaults of any Subcontractor, his or her agents or employees, as if they were the acts or defaults of the Contractor.
	20.2 The Contractor shall not be required to obtain consent from the Engineer, for suppliers solely of Materials or to a subcontract for which the Specialist Subcontractor(s) is already named in the Contract.
	20.3 The prior consent, in writing, of the Engineer shall however be obtained for other proposed Subcontractor(s).
21. Nominated Subcontractor	21.1 Nominated Subcontractor named in the Contract shall be entitled to execute the specific components of the Works stated in the PCC.
	21.2 The Contractor shall not be under obligations to employ a Nominated Subcontractor against whom the Contractor raises reasonable objection by notice to the Engineer as soon as practicable, with supporting particulars while there are reasons to believe that the Subcontractor does not have sufficient competence, resources or financial strength, or does not accept to indemnify the Contractor against and from any

negligence or misuse of Goods by the nominated Subcontractor, or does not accept to enter into a subcontract which specifies that, for the subcontracted work including design, if any, the Nominated Subcontractor shall undertake to the Contractor such obligations and liabilities as will enable the contractor to discharge his or her liabilities under the Contract.

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| | 21.3 | Subcontracting shall in no event relieve the Contractor from any of its obligations, duties, responsibilities, or liability under the Contract and all Subcontractors shall comply with the provisions of GCC Clause 38. |
| 22. Other Contractors | 22.1 | The Contractor shall cooperate and share the Site with other Contractors, public authorities, utilities, the Engineer and the Employer between the dates given in the Schedule of other Contractors. 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. |
| 23. Engineer's Decisions | 23.1 | Except where otherwise specifically stated in the PCC, the Engineer will decide Contractual matters between the Employer and the Contractor in its role as representative of the Employer. |
| 24. Delegation | 24.1 | The Engineer may delegate any of his duties and responsibilities to his representative, after notifying the Contractor, and may cancel any delegation, without retroactivity, after notifying the Contractor. |
| | 24.2 | Any communications to the Contractor in accordance with such delegation shall have the same effect as if it was given by the Engineer. |
| 25. Instructions | 25.1 | The Contractor shall carry out all instructions of the Engineer that comply with the applicable law. |
| 26. Queries about the Contract conditions | 26.1 | The Engineer, on behalf of the Employer, will clarify queries on the Conditions of Contract. |
| 27. Safety, Security and Protection of the Environment | 27.1 | <p>The Contractor shall throughout the execution and completion of the Works and the remedying of any defects therein:</p> <ul style="list-style-type: none"> (a) take all reasonable steps to safeguard the health and safety of all workers working on the Site and other persons entitled to be on it, and to keep the Site in an orderly state; (b) provide and maintain at the Contractor's own cost all lights, guards, fencing, warning signs and watching for the protection of the Works or for the safety on-site; and (c) take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of the Contractors methods of operation. |

- 28. Working Hours** 28.1 The Contractor shall not perform any work on the Site on the weekly holidays, or during the night or outside the normal working hours, or on any religious or public holiday, without the prior written approval of the Engineer.
- 29. Welfare of Laborers** 29.1 The Contractor shall comply with all the relevant labour Laws applicable to the Contractor's personnel relating to their employment, health, safety, welfare, immigration and shall allow them all their legal rights.
- 29.2 The Contractor, in particular, shall provide proper accommodation to his or her labourers and arrange proper water supply, conservancy and sanitation arrangements at the site for all necessary hygienic requirements and for the prevention of epidemics in accordance with relevant regulations, rules and orders of the government.
- 29.3 The Contractor, further in particular, shall pay reasonable wages to his or her labourers, and pay them in time. In the event of delay in payment the Employer may effect payments to the labourers and recover the cost from the Contractor.
- 29.4 The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to issue instructions and take appropriate protective measures to prevent accidents that could result in injury. Throughout the execution of the Works, the Contractor shall provide whatever is required by this person to exercise this responsibility and authority.
- 30. Child Labor** 30.1 The Contractor shall not employ any child to perform any work that is economically exploitative, or is likely to be hazardous to, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development in compliance with the applicable laws and other relevant treaties ratified by the government.
- 31. Fossils** 31.1 All fossils, coins, articles of value or antiquity, and structures and other remains or items of geological or archaeological interest found on the Site shall be placed under the care and authority of the Employer. The Contractor shall take reasonable precautions to prevent Contractor's Personnel or other persons from removing or damaging any of these findings.

- 31.2 The Contractor shall, upon discovery of any such finding, promptly give notice to the Engineer, who shall issue instructions for dealing with it. If the Contractor suffers delay and/or incurs cost from complying with the instructions, the Contractor shall give a further notice to the Engineer and shall be entitled subject to Claims under GCC Clause 99 to:
- (a) an extension of time for any such delay, if completion is or will be delayed, under GCC Clause 45, and
 - (b) payment of any such cost, which shall be included in the Contract Price.
- 32. Employer's and Contractor's Risks**
- 32.1 The Employer carries the risks that the Contract states are Employer's risks and the Contractor carries the risks that the Contract states are Contractor's risks.
- 33. Employer's Risks**
- 33.1 From the Start Date until the Defects Correction 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.
- 33.2 From the Completion Date until the Defects Correction Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is 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 Employer's risk; or
 - (c) the activities of the Contractor on the Site after the Completion Date.
- 34. Contractor's Risks**
- 34.1 From the Start Date until the Defects Correction 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.

35. Copyright

- 35.1 The copyright in all drawings, documents, and other materials containing data and information furnished to the Employer by the Contractor herein shall remain vested in the Contractor, or, if they are furnished to the Employer directly or through the Contractor by any third party, including Suppliers of materials, the copyright in such materials shall remain vested in such third party.
- 35.2 The Contractor shall not, except for the purposes of performing the obligations under the Contract, without the written permission of the Employer disclose or make use of any specification, plan, design and drawing, pattern, sample or information furnished by or on behalf of the Employer.

36. Limitation of Liability

- 36.1 Except in cases of criminal negligence or wilful misconduct:
- (a) the Contractor shall not be liable to the Employer, whether in Contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Contractor to pay liquidated damages to the Employer; and
 - (b) the aggregate liability of the Contractor to the Employer, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective Works, or to any obligation of the Contractor to indemnify the Employer with respect to patent infringement.

37. Insurance

- 37.1 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 specified 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.
- 37.2 The Contractor shall deliver policies and certificates of insurance to the Engineer, for the Engineer's approval, before the Start Date. All such insurances shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.
- 37.3 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.

37.4 Alterations to the terms of insurance shall not be made without the approval of the Engineer.

37.5 Both parties shall comply with conditions of the insurance policies.

38. Management and Progress Meetings

38.1 Either the Engineer or the Contractor may require the other to attend a management and progress meeting. The business of such meeting shall be to review the progress and plans for remaining work and to deal with matters raised in accordance with the early warning procedure.

38.2 The Engineer shall record the business of the 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 Engineer either at the management and progress meeting or after the meeting, and stated in writing to all concerned.

39. Corrupt, Fraudulent, Collusive or Coercive Practices

39.1 The Government requires that Employer, as well as the Contractor shall observe the highest standard of ethics during the implementation of procurement proceedings and the execution of the Contract under the Contract.

39.2 The Government requires that Employer, as well as the Contractor shall, during the Procurement proceedings and the execution of the Contract under public funds, ensure-

- (a) strict compliance with the provisions of Section 64 of the Public Procurement Act, 2006;
- (b) attending by the code of ethics as mentioned in the Rule 127 of the Public Procurement Rules, 2008;
- (c) that neither it, nor any other member of its staff, or any other agents or intermediaries working on its behalf engages in any such practice as detailed in GCC Sub Clause 39.3.

39.3 For the purposes of GCC Sub Clause 39.2, the terms set forth below as follows:

- (a) **“corrupt practice”** means offering, giving or promising to give, receiving, or soliciting either directly or indirectly, to any officer or employee of a Employer or other public or private authority or individual, a gratuity in any form; employment or any other thing or service of value as an inducement with respect to an act or decision or method followed by a Employer in connection with a Procurement proceeding or Contract execution;
- (b) **“fraudulent practice”** means the misrepresentation or omission of facts in order to influence a decision to be taken in a Procurement proceeding or Contract execution;

- (c) **“collusive practice”** means a scheme or arrangement between two (2) or more Persons, with or without the knowledge of the Employer, that is designed to arbitrarily reduce the number of Tenders submitted or fix Tender prices at artificial, non-competitive levels, thereby denying a Employer the benefits of competitive price arising from genuine and open competition; or
 - (d) **“coercive practice”** means harming or threatening to harm, directly or indirectly, Persons or their property to influence a decision to be taken in the Procurement proceeding or the execution of the Contract, and this will include creating obstructions in the normal submission process used for Tenders.
- 39.4 Should any corrupt, fraudulent, collusive or coercive practice of any kind come to the knowledge of the Employer, it will, in the first place, allow the Contractor to provide an explanation and shall, take actions only when a satisfactory explanation is not received. Such decision and the reasons thereof, shall be recorded in the record of the procurement proceedings and promptly communicated to the Contractor. Any communications between the Contractor and the Employer related to matters of alleged fraud or corruption shall be in writing.
- 39.5 If corrupt, fraudulent, collusive or coercive practices of any kind determined by the Employer against the Contractor alleged to have carried out such practices, the Employer will :
- (a) exclude the Contractor from further participation in the particular Procurement proceeding; or
 - (b) declare, at its discretion, the Contractor to be ineligible to participate in further Procurement proceedings, either indefinitely or for a specific period of time.
- 39.6 The Contractor shall be aware of the provisions on corruption, fraudulence, collusion and coercion in Section 64 of the Public Procurement Act, 2006 and Rule 127 of the Public Procurement Rules, 2008.

B. Time Control

40. Commencement of Works

- 40.1 Except otherwise specified in the PCC , the Commencement Date shall be the date at which the following precedent conditions have all been fulfilled and the Engineer’s instruction recording the agreement of both Parties on such fulfilment and instructing to commence the Works is received by the Contractor:
- (a) signing of the Contract Agreement by both parties upon approval of the by relevant authorities;
 - (b) except if otherwise specified in the PCC , possession of the Site given to the Contractor as required for the commencement of the Works; and

- (c) receipt by the Contractor of the Advance Payment under GCC Clause 78 provided that the corresponding Bank Guarantee has been delivered by the Contractor.
- 40.2 If the Engineer's instruction is not received by the Contractor within one hundred eighty (180) days from the date of signing of the Contract Agreement, the Contractor shall be entitled to terminate the Contract under GCC Sub Clause 93.1.
- 40.3 The Contractor shall commence the execution of the Works as soon as is reasonably practicable by the Start Date as specified in the GCC Sub Clause 1.1(pp) after the Commencement Date, and shall then proceed with the Works with due expedition and without delay.
- 41. Completion of Works**
 - 41.1 The Contractor shall carry out the Works in accordance with the Programme of Works submitted by the Contractor and as updated with the approval of the Engineer as stated under GCC Clause 42 to complete them in all respects by the Intended Completion Date.
- 42. Programme of Works**
 - 42.1 Within the time stated in the PCC, the Contractor shall submit to the Engineer for approval a Programme of Works showing the general methods, arrangements, order, and timing for all the activities in the Works. The programme may be in the form of an Implementation Schedule prepared in any software or other form acceptable to the Engineer.
 - 42.2 The Contractor shall submit to the Engineer for approval of an updated Programme at intervals no longer than the period stated in the PCC. An update of the Programme shall be a Programme 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.
 - 42.3 If the Contractor does not submit an updated Programme of Works at the intervals stated in the PCC, the Engineer may withhold an amount as stated in the PCC from the next payment certificate and continue to withhold this amount until the next due payment after the date on which the overdue Programme of Works has been submitted.
 - 42.4 The Engineer's approval of the Programme of Works shall not alter the Contractor's obligations. The Contractor may revise the Programme and submit it to the Engineer again at any time for approval. A revised Programme shall show the effect of Variations and Compensation Events.
- 43. Pro Rata Progress**
 - 43.1 The Contractor shall maintain Pro Rata progress of the Works. Progress to be achieved shall be pursuant to GCC Clause 42 and shall be determined in terms of the value of the works done.
 - 43.2 Failure to achieve the progress in accordance with the updated Programme of Works stated under GCC sub Clause 42.1 and 42.2 by the Contractor may be treated as the fundamental breach of the Contract under GCC Clause 95.1.

- 44. Early Warning**
- 44.1 If at any time during performance of the Contract, the Contractor or its Subcontractors should encounter events, circumstances, conditions that may adversely affect the quality of the work, increase the original Contract Price or delay the execution of the Works, the Contractor shall promptly notify the Engineer in writing of the delay, its likely duration, and its cause. As soon as practicable after receipt of the Contractor's notice, the Engineer shall evaluate the situation, and the Contractor shall cooperate with the Engineer in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced.
- 44.2 The Engineer may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the original Contract price and Completion Date. The Contractor shall provide the estimate and the Engineer shall further proceed as soon as reasonably possible.
- 45. Extension of Intended Completion Date**
- 45.1 The Contractor shall be entitled to an extension of the Intended Completion Date, if and to the extent that completion of the Works or any part thereof is or will be delayed by Compensation Events or a Variation or Extra Work Order.
- 45.2 If the Contractor considers itself to be entitled to an extension of the Intended Completion Date as stated under GCC Sub Clause 45.1, the Contractor shall give notice, not later than twenty eight (28) days after the Contractor became aware or should have become aware of the event or circumstance, to the Engineer pursuant to GCC Sub Clause 99.1.
- 45.3 The Employer shall decide whether and by how much to extend the Intended Completion Date within twenty-one (21) days of the Contractor asking the Engineer 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 extension of Intended Completion Date.
- 45.4 The Employer may **extend the Intended Completion Date** by twenty (20) percent of the original Contract time as stated under GCC Sub Clause 45.1, if a Compensation Event occurs or a Variation Order is issued which does not make it possible to complete the Works by the Intended Completion Date without incurring additional cost.
- 45.5 In the case an extension of the Intended Completion Date required under GCC Sub Clause 45.3 is or will be more than twenty (20) percent of the original Contract time, approval of the Head of the Procuring Entity for the same shall be required to be obtained.
- 46. Delays**
- 46.1 If the following conditions apply, namely:

Caused by Authorities	(a) the Contractor has diligently followed the procedures laid down by the relevant legally constituted public authorities, (b) these public authorities delay or disrupt the Contractor's work, and (c) the delay or disruption was unforeseeable; then this delay or disruption will be considered as a cause of delay under GCC Sub Clause 46.1.
	46.2 The Engineer shall notify the Contractor accordingly keeping the Employer posted.
	46.3 Except in case of Force Majeure, as provided under GCC Clause 88, a delay by the Contractor in the performance of its Completion obligations shall render the Contractor liable to the imposition of Liquidated Damages pursuant to GCC Clause 76, unless an extension of Intended Completion Date is agreed upon, pursuant to GCC Clause 45.
	46.4 If the Contractor fails to complete the Works by the Intended Completion Date or as extended by the Employer or Head of the Procuring Entity, as the case may be under GCC Sub Clause 45.4 or 45.5, the Contractor shall be liable to pay Liquidated Damages to the Employer pursuant to GCC Clause 76.
47. Acceleration	47.1 When the Employer wants the Contractor to finish the Works before the Intended Completion Date, the Engineer will obtain priced proposals for achieving the necessary acceleration from the Contractor. If the Employer accepts these proposals, the Intended Completion Date will be advanced accordingly and confirmed by both the Employer and the Contractor. 47.2 If the Employer accepts the Contractor's priced proposals for acceleration, they will be incorporated in the Contract Price and treated as a Variation under GCC Clause 65.
48. Delays Ordered by the Engineer	48.1 The Engineer may instruct the Contractor to delay the start or progress of any activity within the Works.
49. Suspension of Work	49.1 The Engineer may at any time instruct the Contractor to suspend progress of part or all of the Works. During such suspension, the Contractor shall protect, store and secure such part or the Works against any deterioration, loss or damage. 49.2 The Engineer may also notify the cause for the suspension. If and to the extent that the cause is notified and is the responsibility of the Contractor, the following GCC Clauses 50, 51 and 52 shall not apply.
50. Consequences of Suspension	50.1 If the Contractor suffers delay and/or incurs Cost from complying with the Engineer's instructions under GCC Clause 48 and/or from resuming the work, the Contractor shall give notice to the Engineer and shall be entitled subject to GCC Clause 99 to:

- (a) an extension of time for any such delay, if Completion is or will be delayed, under GCC Clause 44, and
 - (b) payment of any such cost, which shall be included in the Contract Price.
- 50.2 After receiving this notice, the Engineer shall proceed to agree or determine these matters.
- 50.3 The Contractor shall not be entitled to any extension of time for, or to any payment of the cost incurred in, making good the consequences of the Contractor's faulty design, workmanship or materials, or of the Contractor's failure to protect, store or secure in accordance with GCC Clause 49.
- 51. Payment for Plant and Materials in Event of Suspension**
 - 51.1 The Contractor shall be entitled to payment of the value, as at the date of suspension, of Plant and/or Materials which have not been delivered to Site, if:
 - (a) the work on Plant or delivery of Plant and/or Materials has been suspended for more than twenty (28) days, and
 - (b) the Contractor has marked the Plant and/or Materials as the Employer's property in accordance with the Engineer's instructions.
- 52. Prolonged Suspension**
 - 52.1 If the suspension under GCC Clause 49 has continued for more than eighty four (84) days, the Contractor may request the Engineer's permission to proceed. If the Engineer does not give permission within twenty eight (28) days after being requested to do so, the Contractor may, by giving notice to the Project Manager, treat the suspension as an omission under GCC Clause 65 of the affected part of the Works. If the suspension affects the whole of the Works, the Contractor may give notice of termination pursuant to GCC Clause 93.
- 53. Resumption of Work**
 - 53.1 After the permission or instruction to proceed is given, the Contractor and the Engineer shall jointly examine the Works and the Plant and Materials affected by the suspension. The Contractor shall make good any deterioration or defect in or loss of the Works or Plant or Materials, which has occurred during the suspension after receiving from the Engineer an instruction to this effect under GCC Clause 65.

C. Quality Control

- 54. Execution of Works**
 - 54.1 The Contractor shall construct, install and carry out the Works and Physical services in accordance with the Specifications and Drawings as scheduled in GCC Clause 6.
- 55. Examination of Works before covering up**
 - 55.1 All works under the Contract shall at all times be open to examination, inspection, measurements, testing and supervision of the Engineer, and the Contractor shall ensure presence of its representatives at such actions provided

proper advance notice is given by the Engineer.

- 55.2 No part of the Works shall be covered up or put out of sight without the approval of the Engineer. The Contractor shall give notice in writing to the Engineer whenever any such part of the Works is ready for examination and the Engineer shall attend to such examination without unreasonable delay.

56. Identifying Defects

- 56.1 The Engineer shall check the works executed by the Contractor and notify the Contractor of any Defects found. Such checking shall not relieve the Contractor from his or her obligations. The Engineer may also instruct the Contractor to search for a Defect and to uncover and test any work that the Engineer considers may have a Defect.

57. Testing

- 57.1 The Contractor shall carry out the Testing of works in accordance with this Clause after providing the relevant documents.
- 57.2 The Contractor shall give to the Engineer not less than twenty one (21) days' notice of the date after which the Contractor will be ready to carry out each of the Testing. Unless otherwise agreed, Testing shall be carried out within fourteen (14) days after this date, on such day or days as the Engineer shall instruct.
- 57.3 In considering the results of the Testing, the Engineer shall make allowances for the effect of any use of the Works by the Employer on the performance or other characteristics of the Works. As soon as the Works have passed any Testing, the Contractor shall submit a certified report of the results of these Tests to the Engineer.
- 57.4 If the Engineer instructs the Contractor to carry out a test not specified in the Specification 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.

58. Rejection of Works

- 58.1 If, as a result of an examination, inspection, measurement or testing, of Works it is found to be defective or otherwise not in accordance with the Contract, the Engineer may reject the Works by giving notice to the Contractor, with reasons. The Contractor shall then promptly make good the defect and ensure that the rejected Works subsequently complies with the Contract.

59. Remedial Work

- 59.1 Notwithstanding any test or certification, the Engineer may instruct the Contractor to:
- (a) remove from the Site and replace any Plant or Materials which is not in accordance with the Contract,

- (b) remove and re-execute any other work which is not in accordance with the Contract, and
 - (c) execute any work which is urgently required for the safety of the Works, whether because of an accident, unforeseeable event or otherwise.
- 59.2 The Contractor shall comply with the instruction issued under GCC Sub Clause 59.1 within a reasonable time, which shall be specified in the instruction, or immediately if urgency is specified under GCC Sub Clause 59.1(c).
- 59.3 If the Contractor fails to comply with the instruction issued under GCC Sub Clause 59.2, the Employer shall be entitled to employ and pay other persons to carry out the work. Except to the extent that the Contractor would have been entitled to payment for the work, the Contractor shall be liable to pay all such costs arising from this failure.
- 60. Correction of Defects**
 - 60.1 The Engineer shall issue a **Defects Liability Schedule** for correction of Defects within fifty six (56) days from the Contractor's request for **Final Payment** stating the scope of corrections or additions that are necessary.
 - 60.2 The Engineer shall give notice to the Contractor, with a copy to the Employer and others concerned, of any Defects before the end of the Defects Liability Period, which begins at Completion Date, and is defined in the PCC.
 - 60.3 Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Engineer's notice.
 - 60.4 The Defects Liability Period shall be extended for as long as Defects remain to be corrected.
 - 60.5 If the corrections or additions scheduled or notified by the Engineer have been completed by the Contractor, the Engineer shall issue a **Defects Correction Certificate**.
- 61. Uncorrected Defects**
 - 61.1 If the Contractor has not corrected a Defect within the time specified in the Engineer's notice, the Engineer shall assess the cost of having the Defect corrected by it, and the Contractor shall remain liable to pay the expenditures incurred on account of correction of such Defect.

D. Cost Control

- 62. Contract Price**
 - 62.1 The Contract price shall be agreed or determined under GCC Sub Clause 62.2 and as specified in the PCC.
 - 62.2 The Contractor shall pay all of taxes, duties, fees, levies, and other charges required to be paid under the Applicable Law under the Contract pursuant to GCC Clause 18 and the Contract Price shall not be adjusted for any of these costs except as provided under the Conditions of the Contract.
- 63. Bill of**
 - 63.1 The priced Bill of Quantities shall be used to calculate the Contract Price. The Bill of Quantities shall provide estimated quantities for

Quantities

the individual items of Works and Dayworks. The Employer may include in the Bill of Quantities the Provisional Sums for payments to Nominated Subcontractor(s) and for meeting other expenditures under the Contract pursuant to GCC Sub Clause 80.

63.2 Except as otherwise stated in the Contract and notwithstanding any other practice:

- (a) measurement shall be made of the net actual quantity of each item of the Permanent Works , and
- (b) the method of measurement shall be in accordance with the Bill of Quantities.

63.3 Items of works quantified in the Bill of Quantities for which no rates or prices have been quoted shall be deemed covered by the amounts at rates and prices of other items in the Contract and shall not be separately paid for.

64. Changes in the Quantities and Unit Rate or Price

64.1 A new rate or price for items included in the Bill of Quantities shall, however, be appropriate for an item of work if:

- (a) the final measured quantity of the work done for any particular item in the Bill of Quantities is increased or decreased by more than twenty five (25) percent from the quantity of this item in the Bill of Quantities;
- (b) the cost resulting from such increase or decrease in quantity of this particular item in the Bill of Quantities multiplied by its specified rate or price is exceeded by one (1) percent of the original Contract price;
- (c) this particular item is not specified in the Contract as a “fixed rate item”;
- (d) this particular item is not specified in the Contract as for which no rates or prices have been quoted and deemed covered by the amounts at rates and prices of other items in the Bill of Quantities stated under GCC Sub Clause 63.3; and

64.2 The new rate or price for the particular item of work included in the Bill of Quantities described under GCC Sub Clause 64.1 shall be adjusted by the Engineer from any relevant rates or prices within the Contract by taking into consideration the context and threshold of the Variation Order as stated under GCC Clause 65.

65. Variations

65.1 The Employer may issue a Variation Order for Procurement of Works and Physical services from the original Contractor to cover any increase or decrease in quantities, including the introduction of new work items that are either due to change of plans, design or alignment to suit actual field conditions, within the **general scope** and **physical boundaries** of this Contract .

65.2 The Employer may also issue an Extra Work Order to cover the introduction of such new works necessary for the completion, improvement or protection of the original works which were not included in the original contract, on the

grounds where there are subsurface or latent physical conditions at the site differing materially from those indicated in the contract, or where there are duly unknown physical conditions at the site of an unusual nature differing materially from those usually encountered and generally recognized as inherent in the work or character provided for in the Contract.

65.3 Variations as defined under GCC Sub Clause 1.1(tt) may be initiated by the Engineer at any time prior to issuing the Taking-Over certificate for the Works, either by an instruction or by a request for the Contractor to submit a proposal.

65.4 Variations may include;

- (a) changes to the quantities of any item of work included in the Bill of Quantities as stated under GCC Sub Clause 64.1; not necessarily however, shall always constitute a Variation until the algebraic summation of costs resulting from such increases or decreases in quantities of changing items included in the Bill of Quantities under the Contract exceeds one (1) percent of the original Contract price;
- (b) changes to the quality and other characteristics of any item of work;
- (c) changes to the levels, positions and/or dimensions of any part of the Works;
- (d) omission of any work unless it is to be carried out by others;
- (e) any additional work, Plant, Materials or services necessary for the Permanent Works, including any associated testing, boreholes and other testing and exploratory work; or
- (f) changes to the sequence or timing of the execution of the Works.

65.5 The Contractor, for any Variation or Extra Work Order, shall deliver a written notice within seven (7) calendar days of being aware of the need for the Variation, giving full and detailed particulars of any extra cost in order that it may be investigated at that time, and failure to provide such notice shall constitute a waiver by the Contractor for any subsequent claim.

65.6 The Contractor shall, under no circumstances, proceed to commence the works under any Variation or Extra Work Order unless it has been approved by the **Approving Authority**.

65.7 The Head of the Procuring Entity may, in exceptions to the GCC Sub Clause 65.6, and subject to the availability of funds and to his or her satisfaction, authorize the immediate start of work under any Variation or Extra Work Order under any or all of the following conditions -

- (a) in the event of an extreme emergency where the carrying out of the work is required urgently to avoid causing damage to public services, or damage to life or

property or to both or to the Works itself; or

- (b) when time is of the essence provided that,
 - i the cumulative increase in value of works under the Contract not yet duly approved does not exceed ten (10) percent of the adjusted original Contract price.
 - ii immediately after the start of work, the corresponding Variation Order or Extra Work Order shall be prepared and submitted for approval following due procedures, and adhering to the time-line stated under GCC Sub Clause 65.11.

65.8 Any cumulative Variation Orders or Extra Work Orders beyond fifteen (15) percent of the original Contract price shall be the subject of another separate contract to be tendered out provided that the Works are separable from this Contract.

65.9 For a Variation or Extra Work Order for works justifiably inseparable from this Contract involving a cumulative amount beyond fifteen (15) percent of the original Contract price, no work thereon shall be commenced unless the said Variation or Extra Work Order has been approved by the **Approving Authority**.

65.10 The Contractor shall not make any alteration and/or modification of the Permanent Works, unless and until the Engineer instructs or communicates such approvals of a Variation or Extra work Order.

65.11 The time for processing of a Variation and an Extra Work Order from its preparation to approval may not exceed thirty (30) days.

65.12 All Variations and Extra Work Orders under the Contract shall be included in the updated Programme of Works produced by the Contractor.

66. Costing of Variations or Extra Orders

66.1 The Contractor shall provide the Engineer with a quotation for carrying out the Variation when requested to do so by the Engineer. The Engineer shall assess the quotation, which shall be given within seven (7) days of the request or within any longer period stated by the Engineer and before the Variation or Extra Work Order is ordered.

66.2 Items of works under Variation or Extra work Order are if exactly the same or similar to those in the Bill of Quantities of the original Contract, the applicable unit rates or prices of those work items in the Bill of Quantities of the original Contract shall be used for costing of those additional work items.

66.3 For new items of works that are not included in the Bill of Quantities of the original Contract as stated under GCC Sub Clause 65.1, the unit rates or prices of those new work items shall be based on ;

- (i) the direct unit costs used in the Bill of Quantities of original Contract for other items (e.g. unit cost of cement, steel rebar,

- formwork, labor rate, equipment rental, etc) as indicated in the Contractor's price breakdown of the cost estimate, if available; or
- (ii) fixed prices acceptable to both the Employer and the Contractor based on market prices; or
 - (iii) the direct cost of the new work items based on (i) and (ii) above shall then be combined with the mark-up factor (i.e. taxes, overheads and profit) used by the Contractor in his or her Tender to determine the unit rate or price of the new work item.
- 66.4 If the Contractor's quotation is found to be unreasonable, the Engineer may order the Variation and make a change to the Contract price, which shall be based on the Engineer's own forecast of the effects of the Variation on the Contractor's costs.
- 66.5 If the Engineer 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 under GCC Sub Clause 72.
- 66.6 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning under GCC Sub Clause 44.1.
- 67. Cash Flow Forecasts**
- 67.1 When the Programme of Works is updated under GCC Sub Clause 42.2, the Contractor shall provide the Engineer with an updated cash flow forecast.
- 68. Payment Certificates**
- 68.1 The basis for payment certificates shall be Bill of Quantities used to determine the Contract price.
- 68.2 The Contractor shall submit to the Engineer monthly statements of the estimated value of the works executed less the cumulative amount certified previously.
- 68.3 The Engineer shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor.
- 68.4 The value of work executed shall be determined by the Engineer and shall comprise the value of the items of works completed as per the unit rates or prices in the Bill of Quantities including the priced Schedules, if any.
- 68.5 The value of work executed shall include the valuation of Variations or Extra Work Orders, Certified Dayworks and Compensation Events.
- 68.6 The Engineer 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.
- 68.7 The Engineer may in any payment certificate make any correction or modification that should properly be made to any

previous payment certificate.

68.8 The Engineer may withhold any payment certificates under the Contract until the Programme of Works has been submitted by the Contractor as stated under GCC Sub Clause 42.2.

68.9 The Engineer may also withhold the cost of rectification or replacement until such rectification or replacement has been completed, if any thing supplied or work done by the Contractor is not in accordance with the Contract. Further, if the Contractor is or was failing to perform any work or obligation in accordance with the Contract, and had been so notified by the Engineer earlier, the value of this work or obligation may be withheld until the work or obligation has been performed.

69. Payments to the Contractor

69.1 The Employer shall pay the Contractor the amounts certified by the Engineer within twenty eight (28) days of the date of each certificate after due adjustments for deductions for advance payments, retention and any other additions or deductions which may have become due under the Contract or otherwise, including those under GCC Clause 99.

69.2 Items of works quantified in the Bill of Quantities for which no rates or prices have been quoted shall be deemed covered by the amounts at rates and prices of other items in the Contract as stated under GCC Sub Clause 63.3 and shall under no circumstances be paid for, by the Employer.

69.3 Payments due to the Contractor in each certificate shall be made into the Bank Account of the title of the Contract specified in the PCC and nominated by the Contractor in the currency specified in the Contract.

70. Delayed Payment

70.1 If the Contractor does not receive payments as stated under GCC Sub Clause 69.1, the Contractor shall be entitled to receive financing charges compounded monthly on the amount unpaid during the period of delay. This period shall be deemed to commence on the date due for payment specified in GCC Sub Clause 69.1.

70.2 These financing charges shall be calculated at the annual rate of interest as specified in the PCC.

70.3 If an amount certified is increased in a subsequent certificate as a result of an award by 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.

71. Payments to Nominated Subcontractor (s)

71.1 The Contractor shall pay to the Nominated Subcontractor(s) the amounts shown on the Nominated Subcontractor's invoices approved by the Contractor which the Engineer certifies to be due in accordance with the subcontract included

under the Contract.

72. Compensation Events

- 72.1 The following shall be Compensation Events:
- (a) The Employer does not give access to or possession of the Site or part of the Site by the Site Possession Date stated in the GCC Sub Clause 13.1;
 - (b) The Employer modifies the Schedule of other Contractors in a way that affects the works of the Contractor under the Contract;
 - (c) The Engineer orders a delay or does not issue Drawings, Specifications, or instructions required for execution of the Works on time;
 - (d) The Engineer instructs the Contractor to uncover or to carry out additional tests upon work, which is then found to have no Defects;
 - (e) The Engineer unreasonably does not approve a subcontract to be let, if applicable;
 - (f) Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of the Notification of Award from the information issued to Tenderers (including the Site Investigation Reports), from information available publicly and from a visual inspection of the Site;
 - (g) The Engineer 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 do 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 Engineer unreasonably delays issuing a Completion Certificate;
 - (l) A situation of Force Majeure has occurred, as defined in GCC Clause 88; and
 - (m) Other Compensation Events described in the Contract or determined by the Engineer in the PCC shall apply.
- 72.2 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 Engineer 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, only on justifiably acceptable grounds duly recorded.
- 72.3 As soon as the Contractor has provided information demonstrating the effect of each Compensation Event upon

the Contractor's forecast cost, the Engineer shall assess it, and the Contract price shall be adjusted accordingly. If the Contractor's forecast is deemed unreasonable, the Engineer shall adjust the Contract price based on the Engineer's own forecast. The Engineer will assume that the Contractor will react competently and promptly to the event.

72.4 The Contractor shall not be entitled to compensation to the extent that the Employer's interests are adversely affected by the Contractor not having given early warning or not having cooperated with the Engineer.

73. Adjustments for Changes in Legislation

73.1 Unless otherwise specified in the Contract, if between the date twenty-eight (28) days before the submission of Tenders for the Contract and the date of the last Completion Certificate, any law, regulation, ordinance, order or bylaw having the force of law is enacted, promulgated, abrogated, or changed in Bangladesh (which shall be deemed to include any change in interpretation or application by the competent authorities) that subsequently affects the Completion Date and/or the Contract price, then such Completion Date and/or Contract price shall be correspondingly increased or decreased, to the extent that the Contractor has thereby been affected in the performance of any of its obligations under the Contract.

73.2 The Engineer shall adjust the Contract Price on the basis of the change in the amount of taxes, duties, and other levies payable by the Contractor, provided such changes have not already been accounted for in the price adjustment as defined in GCC Clause 74 and/or reflected in the Contract price.

74. Price Adjustment

74.1 Prices shall be adjusted for fluctuations in the cost of inputs only if provided for in the PCC. If so provided, the amounts as certified in each payment certificate, before deducting for Advance Payment, shall be adjusted by applying the respective price adjustment factor to the payment amount. The generic formula indicated below in the form as specified in the PCC applies:

$$P = A + B (Im/Io)$$

where:

P is the adjustment factor

A and **B** are Coefficients specified in the PCC, representing the nonadjustable and adjustable portions, respectively, of the Contract; and

Im is the Index during the month the work has been executed and **Io** is the Index prevailing twenty eight (28) days prior to the deadline for submission of Tender.

The Indexes to be used is as published by the Bangladesh Bureau of Statistics (BBS) on a monthly basis. In case not available, then other countries or authorities of the sources mentioned in **Appendix to the Tender** may be used.

- 74.2 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 or in the final payment certificate. The Index value shall be deemed to take account of all changes in price due to fluctuations.
- 75. Retention Money**
- 75.1 The Employer shall retain from each progressive payment due to the Contractor at the percentage specified in the PCC until completion of the whole of the Works under the Contract.
- 75.2 On completion of the whole of the Works, the first half the total amount retained under GCC Sub Clause 75.1 shall be repaid to the Contractor and the remaining second half after the Defects Liability Period has passed and the Engineer has certified in the form of **Defects Corrections Certificate** as stated under GCC Sub Clause 60.5 that all Defects notified by the Engineer to the Contractor before the end of this period have been corrected.
- 75.3 On completion of the whole of the Works, the Contractor may substitute an unconditional Bank Guarantee an internationally reputable Bank which has a correspondent Bank located in Bangladesh in the format as specified (**Form PW5-11**) acceptable to the Employer for the second half of the retention money as stated under GCC Sub Clause 75.2.
- 75.4 Deductions of Retention Money shall be applicable in this Contract, if no advance payment has been made to the Contractor and in such case, the provisions under GCC Sub Clauses 79.1 and 79.2 shall be applied.
- 75.5 If the provision of Retention Money is not included in this Contract these Sub Clauses shall not apply except the relevant ones.
- 76. Liquidated Damages**
- 76.1 The Contractor shall be liable to pay Liquidated Damages or in other words the Delay Damages to the Employer at the rate per day as specified in the PCC for each day of delay from the Intended Completion Date, for the uncompleted Works or for any part thereof.
- 76.2 The total amount of Liquidated Damages shall not exceed the amount defined in the PCC.
- 76.3 Once the cumulative amount of Liquidated Damages reaches ten (**10**) percent of the Contract price, the Employer may rescind the Contract, without prejudice to other courses of action and remedies open to it.
- 76.4 The amount of Liquidated Damages may be deducted from any money due or which may become due to the Contractor under the Contract and/or collect such amount of Liquidated Damages from the Retention Money (if any) or other securities posted by the Contractor whichever is convenient to the Employer.
- 76.5 Payment of Liquidated Damages by the Contractor shall not

relieve the Contractor from its obligations.

- 76.6 If the Intended Completion Date is extended after Liquidated Damages have been paid, the Engineer shall correct any overpayment of Liquidated Damages by the Contractor by adjusting the next payment certificate.

77. Bonus

- 77.1 The Contractor shall be paid a Bonus calculated at the rate per calendar day if stated in the PCC for each day (less any days for which the Contractor is paid for acceleration) that the Completion of the whole of the Works is earlier than the Intended Completion Date. The Engineer shall require certifying that the Works are complete, although they may not have fallen due to being complete as per approved updated Programme of Works.

78. Advance Payment

- 78.1 The Employer shall make advance payment, if so specified in the PCC, to the Contractor in the amounts and by the dates specified in the PCC against an Unconditional Bank Guarantee issued by an internationally reputable Bank which has a correspondent Bank located in Bangladesh in the format as specified (**Form PW5-10**) and acceptable to the Employer, of an amount equal to the advance payment.
- 78.2 The Guarantee stated under GCC Sub Clause 78.1 shall remain effective until the advance payment has been repaid by the Contractor, but the amount of the Guarantee shall be progressively reduced by the amounts repaid. No interest will be charged on the advance payment made.
- 78.3 The Contractor shall 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 for such specific purposes by supplying copies of invoices or other documents to the Engineer.
- 78.4 The advance payment shall be repaid by deducting at proportionate rate from payments otherwise due to the Contractor, based on percentages of actually completed Works as specified in the PCC.
- 78.5 Advance payment or its repayment shall not be taken into account in assessing Valuation of work done, Variations or Extra Work Order, Price Adjustments, Compensation Events, Bonuses or Liquidated Damages.
- 78.6 If the repayment of advance payment by the Contractor has not been completed by twenty eight (28) days prior to the expiry date of the Guarantee stated under GCC Sub Clause 78.2, the Contractor shall correspondingly extend the validity of the Guarantee for a period so long the advance payment has been fully repaid.
- 78.7 If the provision of advance payment is not included in this Contract these Sub Clauses shall not apply.

79. Performance Security

- 79.1 Without limitation to provisions of any of these Sub Clauses, whenever the Engineer determines an addition or a reduction to the Contract price as a result of change in cost and/or legislation or a result of Variation or Extra Work Order amounting to more than fifteen (15) percent of the original Contract price, the Contractor shall at the Engineer's request promptly increase, or may decrease, as the case may be, the amount of the Performance Security furnished at the time of signing of the Contract Agreement by an equal percentage.
- 79.2 The Performance Security furnished at the time of signing of the Contract Agreement or as determined under GCC Sub Clause 79.1, shall be substituted by a new Security covering fifty (50) percent of the amount of the Performance Security to cover the Defects Liability Period.
- 79.3 The amount of the new Security under GCC Sub Clause 79.1 to be provided by the Contractor shall be calculated based on the final Contract Price and shall cover twenty eight (28) days beyond the Defects Liability Period.
- 79.4 The Employer shall notify the Contractor of any claim made against the Bank issuing the Performance Security.
- 79.5 The Employer may claim against the security if any of the following events occurs for fourteen (14) days or more.
- (a) The Contractor is in breach of the Contract and the Employer has duly notified him or her ; and
 - (b) The Contractor has not paid an amount due to the Employer and the Employer has duly notified him or her.
- 79.6 In the event the Contractor is liable to pay compensation under the Contract amounting to the full value of the Performance Security or more, the Employer may call the full amount of the Performance Security.
- 79.7 The Employer shall not make any claim under the Performance Security, except for amounts to which the Employer is entitled under the Contract.
- 79.8 If there is no reason to call the Performance Security, the Performance Security shall be discharged by the Employer and returned to the Contractor not later than twenty-eight (28) days following the date of issuance of Defects **Correction Certificate** of Works by the Engineer as stated under GCC Sub Clause 60.5 or as otherwise specified in the Contract.

80. Provisional Sums

- 80.1 Provisional Sums shall only be used, in whole or in part, in accordance with the Engineer's instructions and the Contract price shall be adjusted accordingly. The total sum paid to the Contractor shall include only such amounts, for the work, supplies or services to which the Provisional Sum relates, as the Engineer shall have instructed.

- 80.2 Plants, Materials or Services to be purchased by the Contractor under the provisions of GCC Sub Clause 80.1 from Nominated Subcontractor(s) or for meeting the other expenditures under the Contract, and for which there shall be included in the Contract price, the actual amounts paid or due to be paid by the Contractor, and a sum for VAT, profit and overhead charges, as applicable, calculated as a percentage of these actual amounts by applying the relevant percentage rate as specified in the PCC.
- 80.3 The Contractor shall, when required by the Engineer, produce quotations, invoices, vouchers and accounts or receipts in substantiation of purchases under GCC Sub Clause 80.2.
- 81. Dayworks**
- 81.1 If applicable, the Dayworks rates in the Contractor's Tender shall be used for small additional amounts of work only when the Engineer has given written instructions in advance for additional work to be paid for in that way.
- 81.2 All works to be paid for as Dayworks shall be recorded by the Contractor on forms approved by the Engineer. Each completed form shall be certified and signed by the Engineer within seven (7) days of the works being done.
- 81.3 The Contractor shall be paid for Dayworks subject to obtaining signed Dayworks forms.
- 81.4 If Dayworks is not included in this Contract these Sub Clauses shall not apply.
- 82. Cost of Repairs to Loss or Damages**
- 82.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Liability Period shall be remedied by the Contractor at the Contractor's own cost, if the loss or damage arises from the Contractor's acts or omissions.

E. Completion of the Contract

- 83. Completion**
- 83.1 The Contractor shall apply by notice to the Engineer for issuing a Completion Certificate of the Works, and the Engineer shall do so upon deciding that the work is completed.
- 84. Completion Certificate and Taking Over**
- 84.1 The Engineer shall, within twenty eight(28) days after receiving the Contractor's application stated under GCC Sub Clause 83.1:
- (a) issue the Completion Certificate to the Contractor, stating the date on which the Works or part thereof were completed in accordance with the Contract, except for any minor outstanding work and defects which may not substantially affect the use of the Works or part thereof for their intended purpose (either until or whilst this work is completed and these defects are remedied); or

- (b) reject the application, giving reasons and specifying the work required to be done by the Contractor to enable the Completion Certificate to be issued. The Contractor shall then complete this work before issuing a further notice under this Sub Clause.
- 84.2 If the Engineer fails either to issue the Completion Certificate or to reject the Contractor's application within the period of twenty eight (28) days, and if the Works or parts thereof, as the case may be, are substantially in accordance with the Contract, the Completion Certificate shall be deemed to have been issued on the last day of that period.
- 84.3 The Employer shall Take-Over the Site and the Works within seven (7) days of the Engineer issuing a Completion Certificate under GCC Sub Clause 84.1.
- 85. Amendment to Contract**
 - 85.1 The amendment to Contract shall generally include extension of time to the Intended Completion Date, increase or decrease in original Contract price and any other changes duly approved under the conditions of the Contract.
 - 85.2 The Employer contracting, shall amend the Contract incorporating the required approved changes subsequently introduced to the original terms and conditions of the Contract in line with the Rules, including prior review, where necessary.
- 86. Final Account**
 - 86.1 The Contractor shall submit with a detailed account of the total amount that the Contractor considers payable under the Contract to the Engineer before the end of the Defects Liability Period.
 - 86.2 The Engineer shall certify the **Final Payment** within fifty six (56) days of receiving the Contractor's account if the payable amount claimed by the Contractor is correct and the corresponding works are completed.
 - 86.3 If it is not, the Engineer shall issue within fifty six (56) days a **Defects Liability Schedule** under GCC Sub Clause 60.1 that states the scope of the corrections or additions that are necessary.
 - 86.4 If the **Final Account of Works** submitted under GCC Sub Clause 86.1 is unsatisfactory even after it has been resubmitted, the Engineer shall decide on the amount payable to the Contractor and issue a payment certificate.
- 87. As-built Drawings and Manuals**
 - 87.1 If "As Built" Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the PCC.
 - 87.2 If the Contractor does not supply the Drawings and/or Manuals by the dates specified in GCC Sub Clause 87.1, or they do not receive the Engineer's approval, the Engineer shall withhold a nominal amount specified in the PCC from

payments due to the Contractor.

88. Force Majeure

88.1 Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind stated below;

- (a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies ;
- (b) rebellion, terrorism, sabotage by persons other than the Contractor's personnel, revolution, insurrection, military or usurped power, or civil war ;
- (c) riot, commotion, disorder, strike or lockout by persons other than the Contractor's personnel ;
- (d) munitions of war, explosive materials, ionising radiation or contamination by radio-activity, except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity ;
- (e) acts of the Government in its sovereign capacity and
- (f) natural catastrophes such as fires, floods, epidemics, quarantine restrictions, freight embargoes, cyclone, hurricane, typhoon, tsunami, storm surge, earthquake, hill slides, landslides, and volcanic activities.

89. Notice of Force Majeure

89.1 If a party is or will be prevented from performing its substantial obligations under the Contract by Force Majeure, then it shall give notice to the other party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented.

89.2 The notice under GCC Sub Clause 89.1 shall be given within fourteen (14) days after the party became aware, or should have become aware, of the relevant event or circumstance constituting Force Majeure.

89.3 The party shall, having given notice, be relieved from performance of its obligations for so long as such Force Majeure prevents it from performing the works.

89.4 Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either party to make payments to the other party under the Contract.

90. Duty to Minimize Delay

90.1 Each party shall at all times use all reasonable endeavors to minimize any delay in the performance of the Contract as a result of Force Majeure.

90.2 A party shall give notice to the other party when it ceases to be affected by the Force Majeure.

91. Consequences of Force Majeure

91.1 If the Contractor is prevented from performing its substantial obligations under the Contract by Force Majeure of which notice has been given under GCC Sub Clause 89, and suffers delay and/or incurs cost by reason of such Force Majeure, the Contractor shall be entitled subject to GCC Sub Clause 99 to:

- (a) an extension of time for any such delay, if completion is

	or will be delayed, under GCC Clause 45, and
	(b) if the event or circumstance is of the kind described sub-paragraphs (a) to (e) of GCC Sub Clause 88.1 and, in the case of sub-paragraphs (b) to (e), occurs in the Country, payment of any such cost, including the costs of rectifying or replacing the Works and Physical services damaged or destructed by Force Majeure, to the extent they are not indemnified through the insurance policy referred to in GCC Clause 37.
	91.2 After receiving notice under GCC Sub Clause 89.2, the Engineer shall proceed to determine these matters under the provisions of the Contract.
92. Force Majeure Affecting Subcontractor	92.1 If any Subcontractor is entitled under any contract or agreement relating to the Works to relief from Force Majeure on terms additional to or broader than those specified in this Clause, such additional or broader Force Majeure events or circumstances shall not be relieved of the Contractor's non-performance or entitle him or her to relief under this Clause.
93. Optional Termination, and Release	93.1 If the execution of substantially all the Works in progress is prevented for a continuous period of eighty four (84) days by reason of Force Majeure of which notice has been given under GCC Sub Clause 89, or for multiple periods which total more than one hundred forty (140) days due to the same notified Force Majeure, then either party may give to the other party a notice of termination of the Contract. In this event, the termination shall take effect seven (7) days after the notice is given, and the Contractor shall proceed to cessation of Works and removal of Contractor's Equipment from Site.
94. Release from Performance	94.1 Notwithstanding any other provision of this Clause, if any event or circumstance outside the control of the parties (including, but not limited to, Force Majeure) arises which makes it impossible or unlawful for either or both parties to fulfil its or their contractual obligations or which, under the law governing the Contract, entitles the parties to be released from further performance of the Contract, then upon notice by either party to the other party of such event or circumstance: (a) the parties shall be discharged from further performance, without prejudice to the rights of either party in respect of any previous breach of the Contract, and (b) the sum payable by the Employer to the Contractor shall be the same as would have been payable under GCC Sub Clause 96.3 if the Contract had been terminated under GCC Sub Clause 95.3.

F. Termination and Settlement of Disputes

95. Termination	95.1 <u>Termination for Default</u>
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- (a) The Employer or the Contractor, without prejudice to any other remedy for breach of Contract, by giving twenty eight (28) days written notice of default to the other party, may terminate the Contract in whole or in part if the other party causes a fundamental breach of Contract.
- (b) Fundamental breaches of the Contract shall include, but shall not be limited to, the following:
 - (i) the Contractor stops work for twenty-eight (28) days when no stoppage of work is shown on the current Programme and the stoppage has not been authorized by the Engineer;
 - (ii) the Engineer instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within twenty-eight (28) days;
 - (iii) the Engineer 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 Engineer;
 - (iv) the Engineer gives Notice that the failure to achieve the progress in accordance with the updated Programme of Works by the Contractor is a non-fulfilment of contractual obligations and the Contractor fails to restore it within a reasonable period of time instructed by the Engineer;
 - (v) the Contractor does not maintain a Security, which is required;
 - (vi) 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 specified in GCC Sub Clause 76;
 - (vii) the Contractor has subcontracted the whole of the Works or has assigned the Contract without the required agreement and without the approval of the Engineer;
 - (viii) the Contractor, in the judgment of the Employer has engaged in practices, as defined in GCC Sub Clause 39, in competing for or in executing the Contract.
- (c) A payment certified by the Engineer is not paid by the Employer to the Contractor within twenty eight (28) days of the date of the Engineer's certificate.

95.2 **Termination for Insolvency**

The Employer and the Contractor may at any time terminate the Contract by giving twenty eight (28) days written notice to the other party if either of the party becomes bankrupt or otherwise insolvent. In such event, termination will be without compensation to any party, provided that such termination will not prejudice or affect

any right of action or remedy that has accrued or will accrue thereafter to the other party.

95.3 Termination for Convenience

- (a) The Employer, by giving twenty eight (28) days written notice sent to the Contractor, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Employer's convenience, the extent to which performance of the Contractor under the Contract is terminated, and the date upon which such termination becomes effective. The termination shall take effect twenty eight (28) days after the later dates on which the Contractor receives this notice or the Employer returns the Performance Security.
- (b) The Employer shall not terminate the contract under GCC Sub Clause 95.3 (a) in order to execute the Works itself or to arrange for the Works to be executed by another contractor or to avoid a termination of the Contract by the Contractor as stated under GCC Sub Clause 95.1(a).

95.4 In the event the Employer terminates the Contract in whole or in part, the Employer shall accept the portion of the Works that are complete and ready for handing over after the Contractor's receipt of notice of termination of the Contract. For the remaining portion of the Works, the Employer may elect:

- (a) to have any portion completed by the Contractor at the Contract terms and prices; and /or
- (b) to cancel the remainder and pay to the Contractor an agreed amount for partially completed Works and for materials and parts previously procured by the Contractor, or
- (c) except in the case of termination for convenience as stated under GCC Sub Clause 95.3 (b), engage another Contractor to complete the Works, and in that case the Contractor shall be liable to the Employer for any cost that may be incurred in excess of the sum that would have been paid to the Contractor, if the work would have been executed and completed by him or her.

95.5 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as soon as is reasonably possible

96. Payment upon Termination

96.1 If the Contract is terminated because of a fundamental breach of Contract under GCC Sub Clause 95.1 by the Contractor, the Engineer shall issue a certificate for the value of the Works done and Plant and Materials ordered less advance payments received up to the date of the issue of the certificate and less the amount from

percentage to apply to the contract value of the works not completed, as indicated in the PCC. 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.

96.2 If the Contract is terminated for the Employer's convenience or because of a fundamental breach of Contract by the Employer, the Engineer shall issue a payment certificate for the value of the work done, Materials ordered, the reasonable cost of removal of Equipment, repatriation of the Contractor's foreign personnel employed solely on the Works and recruited specifically for 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.

96.3 If the Contract is terminated for reasons of Force Majeure, the Engineer shall determine the value of the work done and issue a Payment Certificate which shall include:

- (a) the amounts payable for any work carried out for which unit rates or prices are stated in the Contract;
- (b) the cost of Plant and Materials ordered for the Works which have been delivered to the Contractor, or of which the Contractor is liable to accept delivery: this Plant and Materials shall become the property of (and be at the risk of) the Employer when paid for by the Employer, and the Contractor shall place the same at the Employer's disposal;
- (c) other costs or liabilities which in the circumstances were reasonably and necessarily incurred by the Contractor in the expectation of completing the Works;
- (d) the cost of removal of Temporary Works and Contractor's Equipment from the Site; and
- (e) the cost of repatriation of the Contractor's staff and labor employed wholly in connection with the Works at the date of termination.

97. Property

97.1 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 stated under GCC Sub Clause 93.1.

98. Frustration

98.1 If the Contract is frustrated by the occurrence of a situation of Force Majeure as defined in GCC Sub Clause 88, the Engineer 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 works carried out before receiving it and for any work carried out afterwards to which a commitment was made.

G. Claims, Disputes and Arbitration

99. Contractor's Claims

- 99.1 If the Contractor considers himself to be entitled to any extension of the Completion Time and/or any additional payment, under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall give notice to the Employer, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than twenty eight (28) days after the Contractor became aware, or should have become aware, of the event or circumstance.
- 99.2 If the Contractor fails to give notice of a claim within such period of twenty eight (28) days, the Intended Completion Date shall not be extended, the Contractor shall not be entitled to additional payment, and the Employer shall be discharged from all liability in connection with the claim.
- 99.3 Within forty two (42) days after the Contractor became aware or should have become aware of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the Engineer, the Contractor shall send to the Engineer a fully detailed claim which includes full supporting particulars of the basis of the claim and of the extension of time and/or additional payment claimed, for settlement.

100. Settlement of Disputes

Amicable settlement

- 100.1 The Employer and the Contractor shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.

Arbitration

- 100.2 If, after twenty-eight (28) days, the parties have failed to resolve their dispute or difference by such mutual consultation as stated under GCC Clause 100.1, then either the Employer or the Contractor may give notice to the other party of its intention to commence arbitration in accordance with GCC Sub Clause 100.3, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given. Any dispute or difference in respect of which a notice of intention to commence arbitration has been given in accordance with this Clause shall be finally settled by arbitration.

- 100.3 Arbitration shall be commenced prior to or after execution of the Works under the Contract. Arbitration proceedings shall be conducted in accordance with the rules of procedure specified in the PCC.
- 100.4 Notwithstanding any reference to arbitration hereinabove the parties shall continue to perform their respective responsibilities under the Contract unless agreed otherwise and, the Employer shall pay any monies due to the Contractor.

Section 4. Particular Conditions of Contract

Instructions for completing the Particular Conditions of Contract are provided in italics in parenthesis for the relevant GCC Clauses.

GCC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
GCC 1.1(l)	The Contractor is <i>[Name, address, and name of authorized representative]</i>
GCC 1.1(v)	The Employer is BANGLADESH WATER DEVELOPMENT BOARD Authorised Representative: A.K.M. Moazzam Hossain Project Director, Project Management Unit (PMU), Capital(Pilot) Dredging of the River System in Bangladesh (CDRSB), BWDB, Dhaka, 72 Green Road, Dhaka-1215
GCC 1.1(w)	The Engineer is 1) The Executive Engineer, Sirajganj O & M Division, BWDB, Sirajganj
GCC 1.1 (gg)	The original Contract price is <i>[insert the amount in the NOA]</i>
GCC 1.1(dd)	The Intended Completion Date for the whole of the Works shall be 30-06-2015
GCC 1.1(nn)	The Site is located at Sirajganj Sadar Upazila, Dist: Sirajgonj and is defined in drawings No: Specified in the Drawings listed in Section 9
GCC 1.1(qq)	The Start Date shall be within 7(seven) days of the commencement date
GCC 1.1(vv)	The Works consist of The work mainly comprises earthwork, manufacturing of C.C Block, procurement of hard rocks/boulders, geo-bags & geo-textile fabrics etc, armouring of the Cross Bar/ Closure (constructed with the dredged spoil earth) by controlled dumping of hard rocks/geo-bags/CC Blocks by Barges and placing CC Blocks for a total length of about 5700 metre, construction of inspection road etc. 4(four) numbers Cross Bar [Cross Bar -1 at BRE Km.162.50, Cross Bar-2 at BRE Km.165.00, Cross Bar-3 (Clouser-1) at BRE Km.169.10 and Cross Bar-4 at BRE Km.175.00] were constructed with the dredged spoil while capital dredging of Januma River was going on during 2011-2012 which facilitated in reclaiming valuable land of about 16 square kilometre at Upazila : Sirajgonj Sadar, District:

	Sirajgonj . The Cross-Bars have been threatening by the on rush of Jamuna River during flood. So, this protective work is aimed at setting aside the Cross Bars from grasp of mighty Jamuna River and thereby protects the reclaimed land. Concurrently 1(one) International Contractor will be engaged for the 2nd Year Maintenance Dredging from Sirajgonj Hard Point to upstream of Bangabandhu Bridge (14 Km) within the vicinity of the proposed Protective Works. There should be harmony among all the Contractors so that no interferences are occurred by any one that impedes execution of dredging & protective works of the Cross Bars. Besides, administering the work by the Engineer as specified in GCC Clause No.1.1 (w), BWDB's Task Force will be assigned for top supervision and monitoring of works in respect to ensure quality and quantities of the works. The Contractor must keep liaison with the Task Force when it visit the site and extend all sort of assistance in performing their (Task Force) assignments uninterruptedly.
GCC 2.5	The Sectional Completion Dates are: None
GCC 3.1	The Employer's address for the purpose of communications under this contract is : Contact person: Address: Project Director, Project Management Unit (PMU), Capital(Pilot) Dredging of the River System in Bangladesh (CDRSB), BWDB,Dhaka Tel: 88-02-9137504, Mobile: 01712175262 Fax: 88-02-9125502 e-mail address: pmucapdredging@gmail.com The Contractor's address for the purpose of communications under this contract is : Contact person: Address:
GCC 6.1 (j)	Other documents forming part of the Contract are; - i Schedule of Key Personnel - ii Site Investigation Report - iii Relevant correspondences prior to signing of Contract Agreement - iv Certified certificates of completion of works/projects
GCC 9.1	A Contractor or a Subcontractor that is a national of, or registered in, the following countries are not eligible: Not Applicable
GCC 9.2	Materials, Equipments Plants and supplies shall not have their origin in the following countries: Israel
GCC 13.1	Possession of the Site or part(s) of the Site, to the Contractor shall be given on the following date(s);

	Within 10(ten) days from the date of commencement as per contract agreement															
GCC 19.1	Following Key Personnel to carry out the functions stated in the Schedule shall be employed by the Contractor; 1 Construction Project Manager 2 Senior Construction Engineer 3 Material Engineer 4 Mid Level Engineer (Civil & Mechanical) 5 Junior Engineer 6 Field Engineer (Civil & Mechanical)															
GCC 21.1	Nominated Subcontractor(s) named below; None															
GCC 23.1	The Contractual matters between the Employer and the Contractor shall be decided by Project Director, PMU, CDRSB, 72 Green Road BWDB, Dhaka															
GCC 37.1	The minimum insurance cover shall be: <table><tr><td>(a)</td><td>The maximum deductible for insurance of the Works and of Plant and Materials is BDT 400,000.00 per occurrence or equivalent US\$ 5000.00</td></tr><tr><td>(b)</td><td>The minimum cover for insurance of the Works and of Plant and Materials in respect of the Contractor's faulty design is 110% of the Contract Price</td></tr><tr><td>(c)</td><td>The maximum deductible for insurance of Equipment is BDT 400,000.00 00 per occurrence or equivalent US\$ 5000.00</td></tr><tr><td>(d)</td><td>The minimum cover for loss or damage to Equipment is 110% of replacement value of the equipment</td></tr><tr><td>(e)</td><td>The maximum deductible for insurance of other property is BDT 400,000.00 per occurrence or equivalent US\$ 5000.00</td></tr><tr><td>(f)</td><td>The minimum cover for insurance of other property is 10% of the contract Price</td></tr><tr><td>(g)</td><td>The minimum cover for personal injury or death insurance: (i) for the Contractor's employees is as per the law and common practice in Bangladesh. (ii) and for third parties is as per the law and common practice in Bangladesh. </td></tr></table>		(a)	The maximum deductible for insurance of the Works and of Plant and Materials is BDT 400,000.00 per occurrence or equivalent US\$ 5000.00	(b)	The minimum cover for insurance of the Works and of Plant and Materials in respect of the Contractor's faulty design is 110% of the Contract Price	(c)	The maximum deductible for insurance of Equipment is BDT 400,000.00 00 per occurrence or equivalent US\$ 5000.00	(d)	The minimum cover for loss or damage to Equipment is 110% of replacement value of the equipment	(e)	The maximum deductible for insurance of other property is BDT 400,000.00 per occurrence or equivalent US\$ 5000.00	(f)	The minimum cover for insurance of other property is 10% of the contract Price	(g)	The minimum cover for personal injury or death insurance: (i) for the Contractor's employees is as per the law and common practice in Bangladesh. (ii) and for third parties is as per the law and common practice in Bangladesh.
(a)	The maximum deductible for insurance of the Works and of Plant and Materials is BDT 400,000.00 per occurrence or equivalent US\$ 5000.00															
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(f)	The minimum cover for insurance of other property is 10% of the contract Price															
(g)	The minimum cover for personal injury or death insurance: (i) for the Contractor's employees is as per the law and common practice in Bangladesh. (ii) and for third parties is as per the law and common practice in Bangladesh.															

GCC 40.1	Commencement Date of Works shall be as follows; Within 15(fifteen) days from the date of signing the Contract Agreement
GCC 42.1	The Contractor shall submit a Programme for the Works within fifteen (15) days of signing the Contract.
GCC 42.2	The period between Programme updates is bi-monthly
GCC 42.3	The amount to be withheld for late submission of an updated Programme is BDT 500,000.00 or equivalent US\$ 6450.00.
GCC 60.2	The Defects Liability Period is 12 (twelve) months
GCC 62.1	The Contract Price is BDT <i>[insert amount]</i> <i>[amount shall be the same as stated in the NOA; Form PW5-7]</i>
GCC 69.3	The particulars of the Bank Account nominated are as follows : Title of the Account : <i>[insert title to whom the Contract awarded]</i> Name of the Bank : <i>[insert name with code, if any]</i> Name of the Branch : <i>[insert branch name with code ,if any]</i> Account Number : <i>[insert number]</i> Address : <i>[insert location with district]</i> Tel : Fax : e-mail address : <i>[information furnished by the Contractor shall be substantiated by the concerned Bank and authenticated by the Employer]</i>
GCC 70.2	The Contractor shall be entitled to receive financing charges for delayed payment during the period of delay at the annual rate of interest of : Nil
GCC 72.1(m)	The following additional events shall also be the Compensation Events: None
GCC 74.1	The Contract is not subject to price adjustment.
GCC 75.1	The proportion of payments to be retained is 5% (five) percent.

GCC 76.1	The amount of Liquidated Damages or in other words Delay Damages for the uncompleted Works or any part thereof is 0.07% (zero point zero seven percent) of the Contract Price per day of delay. <u>Guide to application of GCC Sub Clause 76.1 above</u> <i>[Liquidated damages is equivalent to an amount to be determined in accordance with the following formula</i> $T_{LD} = V_{UW} \times P \times n$ Where; T_{LD} = Total amount of Liquidated Damages V_{UW} = Value of Uncompleted Works (i.e. works not having been completed as of the expiry of the Intended Completion Date plus the works completed after the expiry of the Intended Completion Date). V_{UW} shall be calculated by deducting the value of the completed works under the Contract from the total Contract price P = Percent-rate at which the Liquidated Damages shall be imposed for every day of delay n = No of days of delay for completion of works under the Contract]
GCC 76.2	The maximum amount of Liquidated Damages for the uncompleted Works or any part thereof is 10(ten) percent of the final Contract price of the whole of the Works.
GCC 77.1	The Bonus for the whole of the Works is Not applicable The maximum amount of Bonus for the whole of the Works Not applicable
GCC 78.1	The Advance Payment shall not be paid
GCC 78.4	Repayment of Advance Payment shall be at the rate of : Not Applicable
GCC 80.2	The percentage for adjustment of Provisional Sums is 19.5
GCC 87.1	The date by which “as-built” drawings are required is within 30(thirty) days of completion of works The date by which operating and maintenance manuals are required is not applicable
GCC 87.2	The amount to be withheld for failing to produce “ as-built ” drawings and/or operating and maintenance manuals by the date required is BDT 500,000.00
GCC 96.1	The percentage to apply to the contract value of the works not completed, representing the Employer's additional cost for completing the uncompleted Works, is 15 (fifteen) percent.
GCC 100.3	The rules of procedure for arbitration proceedings shall be as follows:

	(i) In the case of a dispute between the Employer and the foreign Contractor, Any dispute, controversy or claim arising out of or relating to this Contract, or breach, termination or invalidity thereof, shall be settled by arbitration in accordance with the United Nations Commission on International Trade Law (UNCITRAL) Arbitration Rules of 1976 as at present in force.
	(ii) In the case of a dispute between the Employer and the national Contractor, in particular, the arbitration shall be conducted in accordance with the Arbitration Act (Act No 1 of 2001) of Bangladesh as at present in force and in the place Dhaka, Bangladesh

Section 5. Tender and Contract Forms

Form	Title
Tender Forms	
PW5 – 1	Tender Submission Letter
PW5 – 2	Tenderer Information
PW5 – 3	JV Partner Information (<i>if applicable</i>)
PW5 – 4	Subcontractor Information (<i>if applicable</i>)
PW5 – 5	Personnel Information
PW5 – 6	Bank Guarantee for Tender Security
Contract Forms	
PW5 – 7	Notification of Award
PW5 – 8	Contract Agreement
PW5 – 9	Bank Guarantee for Performance Security
PW5 –10	Bank Guarantee for Advance Payment (<i>if applicable</i>)
PW5 –11	Bank Guarantee for Retention Money Security (<i>when this option is chosen</i>)

Forms **PW5 -1** to **PW5 -6** comprises part of the Tender Format and should be completed as stated in ITT Clause 20.

Forms **PW5 -7** to **PW5 -11** comprises part of the Contract as stated in GCC Clause 6.

Tender Submission Letter (Form PW5-1)

[This letter should be completed and signed by the Authorised Signatory preferably on the Letter-Head Pad of the Tenderer]

To:

[Contact Person]

[Name of Procuring Entity]

[Address of Procuring Entity]

Date:

Invitation for Tender No:

[indicate IFT No]

Tender Package No:

[indicate Package No]

This Package is divided into the following Number of Lots

[indicate number of Lot(s)]

We, the undersigned, offer to execute in conformity with the Conditions of Contract and associated Contract documents, the following Works and Physical services, viz:

In accordance with ITT Clauses 23 and 24, the following prices and discounts apply to our Tender:

The Tender Price is:

[insert amount in Tender currency]

(ITT Sub Clause 23.1)

[insert above amount in words]

The unconditional discount for being awarded more than one lot in this package is:

[insert amount in Tender currency]

[insert above amount in words]

(ITT Sub Clause 23.7)

The methodology for application of the discount is:

[state the methodology]

The advance payment is:

[state the amount based on percentage of the Tender Price]

(GCC Sub Clause 78.1)

and we shall accordingly submit an Advance Payment Guarantee in the format shown in Form **PW5-10**.

In signing this letter, and in submitting our Tender, we also confirm that:

- (a) our Tender shall be valid for the period stated in the Tender Data Sheet (ITT Sub Clause 29.2) and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (b) a Tender Security is attached in the form of a **bank guarantee** in the amount stated in the Tender Data Sheet (ITT Sub Clause 31.2) and valid for a period of twenty eight (28) days beyond the Tender validity date;

- (c) if our Tender is accepted, we commit to furnishing a Performance Security within the time stated under ITT Sub Clause 62.2 in the amount stated in the Tender Data Sheet (ITT Sub Clauses 61.2 and 61.3) and in the form specified in the Tender Data Sheet (ITT Sub Clause 62.1) valid for a period of twenty eight (28) days beyond the date of issue of the Completion Certificate of the Works;
- (d) we have examined and have no reservations to the Tender Document, issued by you on *[insert date]*; including Addendum to Tender Document No(s) *[state numbers]* , issued in accordance with the Instructions to Tenderers (ITT Clause 11). *[insert the number and issuing date of each addendum; or delete this sentence if no Addendum has been issued]*;
- (e) we, including as applicable, any JVCA partner or Specialist Subcontractor for any part of the contract resulting from this Tender process, have nationalities from eligible countries, in accordance with ITT Clause 5;
- (f) we are submitting this Tender as a sole Tenderer in accordance with ITT Sub Clause 36.3
or
 we are submitting this Tender as the partners of a JVCA, comprising the following other partners in accordance with ITT Sub Clause 36.4;

	Name of Partner	Address of Partner
1		
2		
3		
4		

- (g) *we are not a Government owned entity as defined in ITT Clause 5.*
or
we are a Government owned entity, and we meet the requirements of ITT Clause 5.;
- (h) we, including as applicable any JVCA partner, declare that we are not associated, nor have been associated in the past, directly or indirectly, with a consultant or any other entity that has prepared the design, specifications and other documents in accordance with ITT Clause 5;
- (i) we, including as applicable any JVCA partner or Specialist Subcontractor for any part of the contract resulting from this Tender process, have not been declared ineligible by the Government of Bangladesh on charges of engaging in corrupt, fraudulent, collusive or coercive practices in accordance with ITT Clause 5;
- (j) furthermore, we are aware of ITT Clause 4 concerning such practices and pledge not to indulge in such practices in competing for or in executing the Contract;
- (k) we intend to subcontract an activity or part of the Works, in accordance with ITT Clause 14, to the following Specialist Subcontractor(s);

Activity or part of the Works

Name of Specialist Subcontractor with Address

- (l) we, including as applicable any JVCA partner, confirm that we do not have a record of poor performance, such as abandoning the works, not properly completing contracts, inordinate delays, or financial failure as stated in ITT Clause 5, and that we do not have, or have had, any litigation against us, other than that stated in the Tenderer Information (**Form PW5-2**);
- (m) we are not participating as Tenderers in more than one Tender in this Tendering process. We understand that your written Notification of Award shall constitute the acceptance of our Tender and shall become a binding Contract between us, until a formal Contract is prepared and executed;
- (n) we, including as applicable any JVCA partner, confirm that we do not have a record of insolvency, receivership, bankrupt or being wound up, our business activities were not been suspended, and it was not been the subject of legal proceedings in accordance with ITT Clause 5;
- (o) we, including as applicable any JVCA partner, confirm that we have fulfilled our obligations to pay taxes and social security contributions applicable under the relevant national laws and regulations of Bangladesh in accordance with ITT Clause 5;
- (p) we understand that you reserve the right to reject all the Tenders or annul the Tender proceedings, without incurring any liability to Tenderers, in accordance with ITT Clause 57.

Signature:

[insert signature of authorised representative of the Tenderer]

Name:

[insert full name of signatory with National ID Number]

In the capacity of:

[insert capacity of signatory]

Duly authorised to sign the Tender for and on behalf of the Tenderer

[If there is more than one (1) signatory, or in the case of a JVCA, add other boxes and sign accordingly].

Attachment 1:

[ITT Sub Clause 36.3 and 36.4]

Written confirmation authorising the above signatory(ies) to commit the Tenderer

[and, if applicable]

Attachment 2:

[ITT Sub Clause 13.2]

Copy of the JV Agreement / Letter of Intent to form JV with draft proposed Agreement submitted at the time of pre-qualification

Tenderer Information (Form PW5-2)

[This Form should be completed only by the Tenderer, preferably on its Letter-Head Pad]

Invitation for Tender No: *[indicate IFT No]*
Tender Package No: *[indicate Package No]*
This Package is divided into the following Number of Lots: *[indicate number of Lot(s)]*

1.	Eligibility Information of the Tenderer [ITT Clauses 5 & 25]	
1.1	Nationality of individual or country of registration	
1.2	Tenderer's legal title	
1.3	Tenderer's registered address	
1.4	Tenderer's legal status <i>[complete the relevant box]</i>	
	Proprietorship	
	Partnership	
	Limited Liability Concern	
	Government-owned Enterprise	
	Others <i>[please describe, if applicable]</i>	
1.5	Tenderer's year of registration	
1.6	Tenderer's authorised representative details	
	Name	
	National ID number, if any	
	Address	
	Telephone / Fax numbers	
	e-mail address	
1.7	Litigation [ITT Cause 13]	
1.8	Tenderer to attach photocopies of the original documents mentioned aside	<i>[All documents required under ITT Clauses 5 and 25]</i>

The following two information are applicable for national Tenderers					
1.9	Tenderer's Value Added Tax Registration (VAT) Number				
1.10	Tenderer's Tax Identification Number(TIN)				
[The foreign Tenderers, in accordance with ITT Clause 5, shall provide evidence by a written declaration to that effect to demonstrate that it meets the criterion]					
2. Qualification Information of the Tenderer [ITT Clause 12]					
2.1	General Experience in Construction Works of Tenderer				
	Start Month Year	End Month Year	Years	Contract No and Name of Contract Name and Address of Employer Brief description of Works	Role of Tenderer [Prime/Sub /Managem ent]
2.2	Specific Experience in Construction Works of Tenderer Completed Contracts of similar nature, complexity and methods/construction technology				
	Contract No		[insert reference no] of [insert year]		
	Name of Contract		[insert name]		
	Role in Contract <i>[tick relevant box].</i>		Prime Contractor	Subcontractor	Management Contractor
	Award date		[insert date]		
	Completion date		[insert date]		
	Total Contract Value		[insert amount]		
	Procuring Entity's Name Address Tel / Fax <u>e-mail</u> Brief description with justifications of the similarity compared to the Employer's requirements		[state justification in support of its similarity compared to the proposed works]		
2.3	Average annual construction turnover [ITT Sub Clause12.2] <i>[total certified payments received for contracts in progress or completed for each year of works in progress or completed; using selling exchange rate quoted by the source being Bangladesh Bank on the date reported, if applicable]</i>				
	Year	Amount & Currency		USD/GBP/EUR/JPY Equivalent delete not appropriate	

2.4	Existing commitments and works [targeted to be completed by the Intended Completion Date of the proposed works; ITT Sub Clause 12.2]			
	Name of Contract Contract No [reference] of [year] Name of Employer Contact Address Tel/fax e-mail		Target Completion Date	Value of Existing Commitments and Works
				Amount & Currency
				USD/GBP/EUR/JPY delete not appropriate Equivalent
2.5	Financial Resources available to meet the construction cash flow [ITT Sub Clause 12.2]			
	No	Source of Financing	Amount Available	
			Amount & Currency	USD/GBP/EUR/JPY delete not appropriate Equivalent
In order to confirm the above statements the Tenderer shall submit , as applicable, the documents mentioned in ITT Clause 28.				
2.6	Contact Details [ITT Clause 28]			
	Name, address, and other contact details of Tenderer Bankers and other Employer(s) that may provide references, if contacted by this Employer			
2.7	Qualifications and experience of key technical and administrative personnel proposed for Contract administration and management [ITT Clause 28]			
	Position Name Years of General Experience		Years of Specific Experience	
[Tenderer to complete details of as many personnel as are applicable. Each personnel listed above should complete the Personnel Information (Form PW5-5)]				
2.8	Major Construction Equipments proposed to carry out the Contract [ITT Clause 28]			
	Item of Equipment		Condition (new, good, average, poor)	Owned, leased or to be purchased (state owner, lessor or seller)
[Tenderer to list details of each item of major construction equipment, as applicable]				

JVCA Partner Information (Form PW5-3)

[This Form should be completed by each JVCA partner].

Invitation for Tender No:

[indicate IFT No]

Tender Package No

[indicate Package No]

This Package is divided into the following Number of Lots

[indicate number of Lot(s)]

1. Eligibility Information of the JVCA Partner [ITT Clauses 5 & 25]		
1.1	Nationality of Individual or country of Registration	
1.2	JVCA Partner's legal title	
1.3	JVCA Partner's registered address	
1.4	JVCA Partner's legal status <i>[complete the relevant box]</i>	
	Proprietorship	
	Partnership	
	Limited Liability Concern	
	Government-owned Enterprise	
	Other (please describe, if applicable)	
1.5	JVCA Partner's year of registration	
1.6	JVCA Partner's authorised representative details	
	Name	
	National ID number, if any	
	Address	
	Telephone / Fax numbers	
	e-mail address	
1.7	Litigation [ITT Cause 13]	
1.8	JVCA Partner to attach copies of the original documents mentioned aside	[All documents required under ITT Clauses 5 and 25]
The following two information are applicable for national JVCA Partners only		
1.9	JVCA Partner's Value Added Tax Registration (VAT) Number	
1.10	JVCA Partner's Tax Identification Number (TIN)	
[The foreign JVCA Partners, in accordance with ITT Clause 5, shall provide evidence by a written declaration to that effect to demonstrate that it meets the criterion]		
2. Key Activity(ies) for which it is intended to be joint ventured [ITT Clause 13]		

	Elements of Activity	Brief description of Activity			
3. Qualification Information of the JVCA Partner [ITT Clause 12]					
3.1 General Experience in Construction Works of JVCA Partner					
	Start Month Year	End Month Year	Years	Contract No and & Name of Contract Name and Address of Procuring Entity Brief description of Works	Role of JVCA Partner [Prime/Sub /Managem ent]
3.2 Specific Experience in Construction Works of JVCA Partner					
Completed Contracts of similar nature, complexity and methods/construction technology					
	Contract No		[insert reference no] of [insert year]		
	Name of Contract		[insert name]		
	Role in Contract [tick relevant box]		Prime Contractor	Subcontractor	Management Contractor
	Award date		[insert date]		
	Completion date		[insert date]		
	Total Contract Amount		[insert amount]		
	If partner in a JV, specify participation of the total Contract Amount		_____ %	Amount & Currency [insert amount] USD/GBP/EUR/JPY Equivalent [insert amount] delete not appropriate	
	Employer's Name Address Tel / Fax e-mail Brief description with justifications of the similarity compared to the Employer's requirements		[state justification in support of its similarity compared to the proposed works]		
3.3 Average annual construction turnover [ITT Sub Clause 12.2]					
<i>[total certified payments received for contracts in progress or completed for each year of works in progress or completed; using selling exchange rate quoted by the source being Bangladesh Bank on the date reported, if applicable]</i>					
	Year	Amount & Currency		USD/GBP/EUR/JPY Equivalent delete not appropriate	
3.4 Existing commitments and works					
[targeted to be completed by the Intended Completion Date of the proposed works; ITT Sub					

Clause 12.2]			
	Name of Contract Contract no [reference] of [year] Name of Employer Contact Address Tel/fax e-mail		Target Completion Date
			Value of Existing Commitments and Works Amount & Currency USD/GBP/EUR/JPY delete not appropriate Equivalent
3.5	Financial Resources available to meet the construction cash flow [ITT Sub Clause 12.2]		
	No	Source of financing	Amount available
			Amount & Currency USD/GBP/EUR/JPY delete not appropriate Equivalent
In order to confirm the above statements the JVCA Partner shall submit, as applicable, the documents mentioned in ITT Clause 28.			
3.6	Contact Details [ITT Clause 28]		
	Name, address, and contact details of Tenderer's Bankers and other Employer(s) that may provide references if contacted by this Employer		
3.7	Qualifications and experience of key technical and administrative personnel proposed for Contract administration and management [ITT Clause 28]		
	Position Name Years of General Experience	Years of Specific Experience	
<i>[Tenderer to complete details of as many personnel as are applicable. Each personnel listed above should complete the Personnel Information (Form PW5-5)]</i>			
3.8	Major items of Construction Equipment proposed for carrying out the works [ITT Clause 28]		
	Item of Equipment	Condition (new, good, average, poor)	Owned, leased or to be purchased (state owner, leaser or seller)
<i>[Tenderer to list details of each item of Major equipment, as applicable]</i>			

Signature
(Name of Authorized Signatory of the JVCA Partner)

Specialist Subcontractor Information (Form PW5-4)

[This Form should be completed by each Subcontractor, preferably on its Letter-Head Pad]

Invitation for Tender No:

[indicate IFT No]

Tender Package No

[indicate Package No]

This Package is divided into the following Number of Lots

[indicate number of Lot(s)]

1. Eligibility Information of the Subcontractor [ITT –Clauses 5 & 25]		
1.1	Nationality of Individual or country of Registration	
1.2	Subcontractor's legal title	
1.3	Subcontractor's registered address	
1.4	Subcontractor's legal status <i>[complete the relevant box]</i>	
	Proprietorship	
	Partnership	
	Limited Liability Concern	
	Government-owned Enterprise	
	Other (please describe)	
1 . 5	Subcontractor's year of registration	
1 . 6	Subcontractor's authorised representative details	
	Name	
	Address	
	Telephone / Fax numbers	
	e-mail address	
1 . 7	Attach copies of the following original documents	All documents to the extent relevant to ITT Clause 5 and 25 in support of its qualifications
The following two information are applicable for national Subcontractors		
1 . 8	Subcontractor's Value Added Tax Registration (VAT) Number	
1 . 9	Subcontractor's Tax Identification Number(TIN)	
[The foreign Subcontractors , in accordance with ITT Clause 5, shall provide evidence by a written declaration to that effect to demonstrate that it meets the criterion]		
2. Key Activity(ies) for which it is intended to be Subcontracted [ITT Clause 14]		
2 . 1	Elements of Activity	Brief description of Activity

2 . 2	List of Similar Contracts in which the proposed Subcontractor had been engaged
	Name of Contract and Year of Execution Value of Contract Name of Employer Contact Person and Contact details Type of Work Performed

Signature and Name of Authorized Signatory of the Proposed Sub-Contractor

Personnel Information (Form PW5-5)

[This Form should be completed for each person proposed by the Tenderer on Form PW5-2 & PW5-3, where applicable]

Name of the Tenderer:	[insert Title]
Invitation for Tender No:	[indicate IFT No]
Tender Package No	[indicate Package No]
This Package is divided into the following Number of Lots	[indicate number of Lot(s)]

A. Proposed Position (tick the relevant box)			
Construction Engineer	Prime Candidate	Alternative Candidate	
Key Personnel	Prime Candidate	Alternative Candidate	
B. Personal Data			
Name:			
Date of Birth:			
Years overall experience:			
National ID Number:			
Years of employment with the Tenderer:			
Professional Qualifications:			
1.			
C. Present Employment <i>[to be completed only if not employed by the Tenderer]</i>			
Name of the Employer:			
Address of the Employer:			
Present Job Title:			
Years with the present Employer:			
Tel No:	Fax No:	e-mail address:	
Contact <i>[manager/personnel officer]</i> :			
D. Professional Experience			
Summarise professional experience over the last twenty (20) years, in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.			
	From	To	Company / Project / Position / Relevant technical and management experience.
1			

(Name and Signature of the Proposed Personnel)

Bank Guarantee for Tender Security (Form PW5-6)

[This is the format for the Tender Security to be issued by an internationally reputable Bank which has a correspondent Bank located in Bangladesh in accordance with ITT Clause 31 & 32]

Invitation for Tender No:

Date:

Tender Package No:

To:

[Name and address of the Employer]

TENDER GUARANTEE No:

We have been informed that *[name of Tenderer]* (hereinafter called "the Tenderer") intends to submit to you its Tender dated *[date of Tender]* (hereinafter called "the Tender") for the execution of the Works of *[description of works]* under the above Invitation for Tenders (hereinafter called "the IFT").

Furthermore, we understand that, according to your conditions, the Tender must be supported by a Bank Guarantee for Tender Security.

At the request of the Tenderer, we *[name of bank]* hereby irrevocably undertake to pay you, without cavil or argument, any sum or sums not exceeding in total an amount of USD/GBP/EUR/JPY
delete not appropriate

[insert amount in figures and words] and/or Bangladesh Taka
delete if not appropriate– *[insert amount in figures and words]*

upon receipt by us of your first written demand accompanied by a written statement that the Tenderer is in breach of its obligation(s) under the Tender conditions, because the Tenderer:

- a. has withdrawn its Tender after opening of Tenders but within the validity of the Tender Security; or
- b. refused to accept the Notification of Award (NOA) within the period as stated under ITT; or
- c. failed to furnish Performance Security within the period stipulated in the NOA; or
- d. refused to sign the Contract Agreement by the time specified in the NOA; or
- e. did not accept the correction of the Tender price following the correction of the arithmetic errors as stated under ITT.

This guarantee will expire

- (a) if the Tenderer is the successful Tenderer, upon our receipt of a copy of the Contract Agreement signed by the Tenderer or a copy of the Performance Security issued to you in accordance with the ITT;
or
- (b) if the Tenderer is not the successful Tenderer, twenty eight (28) days after the expiration of the Tenderer's Tender validity period, being *[date of expiration of the Tender validity plus twenty eight (28) days]*.

Consequently, we must receive at the above-mentioned office any demand for payment under this guarantee on or before that date.

Name and Signature

Name and Signature

Notification of Award (Form PW5-7)

Contract No:
To:

Date:

[Name of Contractor]

This is to notify you that your Tender dated *[insert date]* for the execution of the Works for *[name of project/Contract]* for the Contract Price of USD/GBP/EUR/JPY *[insert amount in figures and words]* ~~delete not appropriate~~ Bangladesh Taka *[insert amount in figures and in words]*, as corrected and modified ~~delete if not appropriate-~~ in accordance with the Instructions to Tenderers, has been approved by *[name of Employer]*.

You are thus requested to take following actions:

- i. accept in writing the Notification of Award within seven (7) working days of its issuance pursuant to ITT Sub Clause 60.4
- ii. furnish a Performance Security in the form of a Bank Guarantee as specified and in the amount of USD/GBP/EUR/JPY *[insert amount in figures and words]* ~~delete not appropriate~~ Bangladesh Taka *[insert amount in figures and words]*, within twenty eight (28) days of issuance of this Notification of Award but not later than (specify date), in accordance with ITT Clause 63.2.
- iii. sign the Contract within twenty eight (28) days of issuance of this Notification of Award but not later than (specify date), in accordance with ITT Sub Clause 65.2.

You may proceed with the execution of the Works only upon completion of the above tasks. You may also please note that this Notification of Award shall constitute the formation of this Contract which shall become binding upon you.

We attach the draft Contract and all other documents for your perusal and signature.

Signed

Duly authorised to sign for and on behalf of
[name of Employer]

Date:

Contract Agreement (Form PW5-8)

THIS AGREEMENT made on this [day] day of [month] [year] between [name and address of Employer] (hereinafter called "the Employer") of the one part and [name and address of Contractor] (hereinafter called "the Contractor") of the other part:

WHEREAS the Procuring Entity invited Tenders for certain works named [brief description of works] and has accepted the Tender submitted by the Tenderer for the execution of those works in the sum of USD/GBP/EUR/JPY [insert amount] **and/or** ^{Bangladesh Taka} [insert amount] [Contract price in figures and in words] (hereinafter called "the Contract Price").
delete not appropriate delete if not appropriate-

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the General Conditions of Contract hereafter referred to.
2. The documents forming the Contract shall be interpreted in the following order of priority:
 - (a) the signed Contract Agreement
 - (b) the Notification of Award
 - (c) the completed Tender and the appendices to the Tender
 - (d) the Particular Conditions of Contract
 - (e) the General Conditions of Contract
 - (f) the Technical Specifications
 - (g) the General Specifications
 - (h) the Drawings
 - (i) the priced Bill of Quantities and the Schedules
 - (j) any other document listed in the PCC forming part of the Contract.
3. In consideration of the payments to be made by the Procuring Entity to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the works and to remedy any defects therein in conformity in all respects with the provisions of the Contract.
4. The Procuring Entity 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 Bangladesh on the day, month and year first written above.

For the Procuring Entity

For the Contractor

Signature

Name

National ID No.

Title

In the presence

of

Name

Address

Bank Guarantee for Performance Security (Form PW5-9)

[This is the format for the Performance Security to be issued by an internationally reputable Bank which has a correspondent Bank located in Bangladesh in accordance with ITT Clause 61, 62 & 63]

Contract No: [insert reference number]

Date: [insert date]

To:

[insert Name and address of Procuring Entity]

PERFORMANCE GUARANTEE No:

We have been informed that *[name of Contractor]* (hereinafter called "the Contractor") has undertaken, pursuant to Contract No *[insert reference number of Contract]* dated *[insert date of Contract]* (hereinafter called "the Contract"), the execution of works *[description of works]* under the Contract.

Furthermore, we understand that, according to your conditions, the Contract must be supported by a Bank Guarantee for Performance Security.

At the request of the Contractor, we *[name of bank]* hereby irrevocably undertake to pay you, without cavil or argument, any sum or sums not exceeding in total an amount of USD/GBP/EUR/JPY/BDT and/or Bangladesh Taka *[insert amount in figures and in words]* upon receipt ~~delete not appropriate~~

by us of your first written demand accompanied by a written statement that the Contractor is in breach of its obligation(s) under the Contract conditions, without you needing to prove or show grounds or reasons for your demand of the sum specified therein.

This guarantee is valid until *[date of validity of guarantee]*, consequently, we must receive at the above-mentioned office any demand for payment under this guarantee on or before that date.

Name and Signature

Name and Signature

Bank Guarantee for Advance Payment (Form PW5-10)

[This is the format for the Advance Payment Guarantee to be issued by an internationally reputable Bank which has a correspondent Bank located in Bangladesh in accordance with GCC Clause 78]

Contract No: [insert reference number]

Date: [insert date]

To:

[insert Name and address of the Procuring Entity]

ADVANCE PAYMENT GUARANTEE No:

We have been informed that *[name of Contractor]* (hereinafter called "the Contractor") has undertaken, pursuant to Contract No *[insert reference number of Contract]* dated *[insert date of Contract]* (hereinafter called "the Contract"), the execution of works *[description of works]* under the Contract.

Furthermore, we understand that, according to your Conditions of Contract under GCC Clause 78, the Advance Payment on Contract must be supported by a Bank Guarantee.

At the request of the Contractor, we *[insert name of bank]* hereby irrevocably undertake to pay you, without cavil or argument, any sum or sums not exceeding in total an amount of USD/GBP/EUR/JPY/BDT and/or Bangladesh Taka *[insert amount in figures and in words]* upon receipt ~~delete not appropriate~~ ~~delete if not appropriate~~

by us of your first written demand accompanied by a written statement that the Contractor is in breach of its obligation(s) under the Contract conditions, without you needing to prove or show grounds or reasons for your demand of the sum specified therein.

We further agree that no change, addition or other modification of the terms of the Contract to be performed, or of any of the Contract documents which may be made between the Employer and the Contractor, 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 is valid until *[insert date of validity of guarantee]*, consequently, we must receive at the above-mentioned office any demand for payment under this guarantee on or before that date.

Name and Signature

Name and Signature

Bank Guarantee for Retention Money Security (Form PW5-11)

[This is the format for the Retention Money Guarantee to be issued by an internationally reputable Bank which has a correspondent Bank located in Bangladesh in accordance with GCC Sub Clause 75.3]

Demand Guarantee

[Bank's Name, and Address of Issuing Branch or Office]

Beneficiary: [insert Name and Address of the Procuring Entity]

Date: [insert date]

RETENTION MONEY GUARANTEE No.: [insert number]

We have been informed that [insert name of Contractor] (hereinafter called "the Contractor") has entered into Contract Number [insert reference number of the Contract] dated [insert date] with you, for the execution of [insert name of Contract and brief description of Works] (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, 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 amount of the second half of the Retention Money] which becomes due after the Defects Liability Period has passed and certified in the form of Defects Correction Certificate, is to be made against a Retention Money Guarantee.

At the request of the Contractor, we [insert name of Bank] hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of USD/GBP/EUR/JPY/BDT and/or Bangladesh Taka [insert amount in figures and words]) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor failed to properly correct the defects duly notified in respect of the Works.
delete not appropriate delete if not appropriate

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 Contractor on its account number [insert A/C no] at [name and address of Bank].

This guarantee is valid until [insert the date of validity of Guarantee that being twenty eight (28) days beyond the Defects Liability Period]. Consequently, we must receive at the above-mentioned office any demand for payment under this guarantee on or before that date.

Name and Signature

Name and Signature

Section 6. Bill of Quantities

Item no	Reference Specification Clause/Sub-Clause	Description of Item	Unit	Quantity	Unit Rate		Amount
					In figures	In words	In figures
							In words
1	2	3	4	5	6	7=6	8=5x6
to be quoted and filled in by the Tenderer							
Bill No.01: General							
1.01 (a)	General Specification Clause No.1.12 & Clause No.1.29 (a)	Refurbishment and upgrading of existing one storied BWDB's Rest House Building at Siraganj under Siraganj O&M Division into two storied Building for Engineer's Site Office	Lump-Sum	1 item			
1.01 (b)	General Specification Clause No.1.12 & Clause No.1.29 (b)	Maintain the facilities in Engineer's Site office at Siraganj during the construction period,	Months	12			
1.01 (c)	General Specification Clause No.1.12 & Clause No.1.29 (c)	Construction Semi-pucca Building (steel framing for roofing with corrugated zincalume sheet) at 72, Green Road, Dahka on BWDB's own land for PMU, CDRSB Office as per approved design	Lump-Sum	1 item			

Tender Document, PW (Protective Work of Cross Bar & Reclaimed land_4 Feb 2014_Final).doc

Item no.	Reference Specification Clause/Sub-Clause	Description of Item	Unit	Quantity	Unit Rate		Amount
					In figures	In words	In figures
							In words
1	2	3	4	5	6	7=8	8=5x6
<i>to be quoted and filled in by the Tenderer</i>							
1.02	General Specification Clause No.1.20 & Clause No.1.30	Contractor's mobilization including arrangement of temporary site office, labor sheds, stores fencing, guarding, site laboratory, etc. and demobilization on completion of the contract	Lump-Sum	1 item			
Total of Bill No.01: for General Items							

✓

Item no.	Reference Specification Clause/Sub-Clause	Description of item	Unit	Quantity	Unit Rate		Amount
					In figures	In words	In figures
							In words
1	2	3	4	5	6	7=6	8=5x6
to be quoted and filled in by the Tenderer							
Bill No.02: Earthwork in Embankment/Crossbar							
2.01	Technical Specification Clause No.2.1	Earth work in constructing/ re-sectioning of embankment compacted to 85% maximum dry density at optimum moisture content with earth borrowed from river bed					
2.01 i)		Earth borrowed from 0.00 Km to 1.00 Km	Cum	83,765.00			
2.01 ii)		Earth borrowed from beyond 1.00 Km to 5.00 Km	Cum	83,765.00			
2.02	Technical Specification Clause No.2.2	Providing clay blanket over embankment crest and slope					
2.02 i)		Carried from 300 m to 1.0 km	Cum	38,187.88			
2.02 ii)		Carried from beyond 300 m to 1.0 km	Cum	38,187.88			
2.03	Technical Specification Clause No.2.3	Fine dressing and close turfing	Sqm	293,959.60			
Total of Bill No.02: Earthwork in Embankment/Crossbar							

Item no.	Reference Specification Clause/Sub-Clause	Description of Item	Unit	Quantity	Unit Rate		Amount
					In figures	In words	In figures
							In words
1	2	3	4	5	6	7=6	8=5x6
					to be quoted and filled in by the Tenderer		

Bill No.03: Protective Works

3.01	Technical Specification Clause No.2.4	Earthwork in cutting and filling of eroded bank	Cum	636.716.23			
3.02	Technical Specification Clause No.2.5	Manufacturing and supplying C.C. Blocks with 40mm down graded stone chips, (1" c = 8.0 N/mm ²) for Protective Work					
3.02 i)		Block Size 40 cm×40 cm×40 cm	Each	383046			
3.02 ii)		Block Size 40 cm×40 cm×20 cm	Each	634709			
3.03	Technical Specification Clause No.2.6	Supplying and measurable stacking of hard rock of specified size,					
3.03 i)		Rock Size 30 cm to 45 cm	Cum	1040/3.61			
3.03 ii)		Rock Size 45 cm and above	Cum	104073.61			
3.04	Technical Specification Clause No.2.7	Supplying and laying sand (FM 1.0 to 1.50) as filter layers for Protective Works	Cum	16522.16			
3.05	Technical Specification Clause No.2.8	Supplying and placing non-woven needle punched geo-textile filter (thickness >=3.00 mm under pressure 2 Kpa) in slope of protective works	Sqm	183256.79			
3.06	Technical Specification	Supplying & Laying 1st Class/Pick Jhama Chips as					



Item no.	Reference Specification Clause/Sub-Clause	Description of item	Unit	Quantity	Unit Rate		Amount
					In figures	In words	In figures
							In words
1	2	3	4	5	₹	Ten	₹=5x5
<i>to be quoted and filled in by the Tenderer</i>							
	Clause No.2.9	filter in two layers					
3.06 i)		40 mm to 20 mm size	Cum	8461.09			
3.06 ii)		20 mm to 5 mm size	Cum	8461.09			
3.07	Technical Specification Clause No.2.10 Sub-Clause 2.10.1 to 2.10.6	Supplying of Geo-textile Bags Bag Size 1200 mm x 950mm Weight – 250 Kg Fill volume – 0.1667 m ³	Each	324,934			
3.08	Technical Specification Clause No.2.10, Sub-Clause 2.10.7	Filling of Empty Geo-Textile Bag, Sewing & Stacking Bag Size 1200 mm x 950mm Weight – 250 Kg Fill volume – 0.1667 m ³	Each	324,934			
3.09	Technical Specification Clause No.2.10, Sub-Clause 2.10.8 & 2.10.9	Dumping of sand filled Geo-bag Bag Size 1200 mm x 950mm Weight – 250 Kg Fill volume – 0.1667 m ³	Each	388,934			
3.10	Technical Specification Clause No.2.11	Placing/laying of different size of Cement Concrete Blocks					
3.10. i)		Within 200 m	Cum	22,428.82			
3.10 .ii)		Beyond 200 m	Cum	22,428.82			
3.11	Technical Specification Clause No.2.12	Dumping of Hard Rocks/ Boulders/CC Block					
		Within 200 m	Cum	94,612.38			
		Beyond 200 m	Cum	94,612.38			

Tender Document, PVs (Protective Work of Cross Bar & Reclaimed land_4 Feb 2014_Final).doc

Item no.	Reference Specification Clause/Sub-Clause	Description of Item	Unit	Quantity	Unit Rate		Amount
					In figures	In words	In figures
							In words
1	2	3	4	5	6	7=6	8=5x6
to be quoted and filled in by the Tenderer							
Total of Bill No.03: Protective Work							
BILL NO.04: ROAD WORKS							
4.01	Technical Specification Clause No.2.13	Earthwork in box cutting as per specification	Cum	32,258.00			
4.02	Technical Specification Clause No.2.14	Brick on end edging with 1 st Class Brick as per specification	Metre	23,460.00			
4.03	Technical Specification Clause No.2.15	Construction of improved sub grade with Sand /Silty sand / other low plasticity materials as per specification	Cum	11,730.00			
4.04	Technical Specification Clause No.2.16	Construction of road sub-base with well graded crushed well burnt picked Jhama or first class bricks as per specification	Cum	7,590.00			
4.05	Technical Specification Clause No.2.17	Compacted water bound macadam base course with 1st class or picked jhama brick chips in two layers and in two operations, as per specification	Cum	7,038.00			
4.06	Technical Specification Clause No.2.18	Providing Tack Coat of Bitumen as per specification	Sqm	35,190.00			

Item no.	Reference Specification Clause/Sub-Clause	Description of Item	Unit	Quantity	Unit Rate		Amount
					In figures	In words	In figures
							In words
1	2	3	4	5	6	7-8	8-9x6
to be quoted and filled in by the Tenderer							
4.07	Technical Specification Clause No.2.19	Provide 50 mm premixed Bituminous carpeting with specified well graded stone chips as per specifications	Sqm	35,190.00			
4.08	Technical Specification Clause No.2.20	Provide pre-mixed seal coat minimum of thickness 9mm as per specification	Sqm	35,190.00			
TOTAL OF BILL NO.04: ROAD WORKS :							

This Bill of Quantities contains [insert number] corrections duly initialed and signed by the authorised person of the Tenderer

Note

- It is suggested that the Tenderer uses these sheets of the BOQ in order to avoid any manipulation, distortion and inadvertent mistakes or omissions in course of preparing the Tender by the Tenderer.

Signature of the Tenderer:

Name of Contractor/Firm:

Registration No. :

Full Address:

BD/Pay order/Bank Guarantee No. Date

(Engr. Gazi Md. Altafuzzaman)

Project Director (Addl. Charge),

PMU - CDRSB

BWDB, Dhaka

Summary of Provisional Sums

Name of Works: _____

IFT No. _____ Package No. _____ Lot No. _____

Item No	Description of Specified Provisional Sums	Unit	Amount
5.02	Provisional Sums for physical contingencies (GCC Sub Clause 80)	Sum	BDT 25,000,000.00
Total of Provisional Sum:			BDT 25,000,000.00

✓

Grand Summary

Name of Works: _____

IFT No. _____ Package No. _____ Lot No. _____

Contract Name: _____

Contract No.: _____

General Summary		Reference	Amount
1.	Bill No.01: General		
2.	Bill No.02 : Earth Work		
3.	Bill No.03 : Protective Works		
4.	Bill No.04 : Road Works		
A. Sub- Total (Bill No.01 to Bill No.04)		In figures	
		In Words	
B. Provision Sum [GCC Sub Clause 80]			BDT 25,000,000.00
TOTAL CONTRACT PRICE FOR THE WORKS (A+B)		In figures	
		In words	

Signature of the Tenderer :

Name of Contractor/Firm :

Registration No. :

Full Address:

BD/Pay order/Bank Guarantee No.

Date

(Engr. Gazi Md. Altafuzzaman)

Project Director (Addl. Charge),

PMU - CDRSB

BWDB, Dhaka

Section 7. General Specifications

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GENERAL REQUIREMENTS

The Section contains General Requirement of the Employer and Technical Specifications. The work should be carried out in accordance with the approved design and specifications. If there is any changes due to site condition the 'Engineer's instruction should govern.

The Tenderer shall submit his own methodology, which will be used only for tender evaluation purpose and Tenderer will be fully responsible for fulfillment of the contract. By providing the under mentioned informative guidelines, the Employer does not bind itself in any way whatsoever. This text may serve as general information on methodology that BWDB follows and the Tenderer may have the option to adopt a similar approach, if he/she considers appropriate without any liability to the Employer

List of Abbreviations

Km	Kilometre	Lin	linear
M	Metre	Cu.	Cubic
Mm	Millimeter	Sq.	Square
Ha	Hectare	g	Gram
m ² ,sq. m	Square metre	m.t	Metric Ton
Mm ²	Square millimeter	ltr	Litre
m ³	Cubic metre	ml	Milliliter
No	Number	s	Second
%	Per cent	min	Minute
°C	Degree Centigrade	kg	Kilogram
BS	British Standard		
N	Newton	VM	Vehicle Month
ASTM	American Society for testing and materials		
US \$	Currency of USA	Taka	Bangladesh Currency
BS	British Standard	ISO	International Organization for Standardization
AASHTO	American Association of State Highway and Transportation Officials		
ACI	American Concrete Institute	AWWA	American Water Works Association
BSI	British Standards Institution	DIN	German Institute for Standardization
SSPC	Society for Protective Coatings	USBR	United States Bureau of Reclamation
STP	Standard Test Procedure (Road & Highways Department)		

1 General

1.01 Introduction:

Bangladesh is a great delta formed by alluvial deposits of the three mighty rivers; the Ganges, the Brahmaputra (Jamuna) and the Meghna. The major rivers carry huge amount of sediments annually in to Bangladesh from out side catchments. Every year the country suffers various types of natural disasters like; flood, river bank erosion, sedimentation, draught, salinity intrusion etc. River bank erosion and widening of the rivers are very much pronounced in the major rivers of Bangladesh. Every year Bangladesh is losing more than 10,000 hectares of valuable land due to river bank erosion.

The Jamuna River a large braded river is the most complex and dynamic in the world. The river originates from China and after travelling several thousands kilometres through China and India enter into Bangladesh from north. Within territory of Bangladesh, the length of the Jamuna River varies from 240 km along its right bank to 220 km along its left bank. The Jamuna transports more than half a billion tons of sediment per year. Due to carrying of huge sediment loads with low gradient, rapidly alternating channels and sand bars (chars) as well as river bed siltation/aggradations is most pronounced. The continuously changing of riverbed has a serious socio-economic impact in Bangladesh since the economy is largely depend on land and water management. In recent years the frequency of devastating floods has increased substantially causing serious damages to infrastructure, life and livelihood of both rural and urban communities. In order to reduce the risk of river bank erosion, flooding and improvement of navigability, dredging of rivers in planned way has been considered to be an effective measure.

So, as a pilot case , Capital (Pilot) Dredging of Jamuna River from upstream of Sirajganj Hard Point to downstream of Bangabandhu Bridge up to Offtake of Daleswari River (20 Km) for streamlining the river flow through defined section and thereby to reduce the risk of bank erosion and disasters was taken up during **2011-2012** followed by maintenance dredging during **2012-2013**. **Simultaneously, 4(four) Nos Cross Bar were constructed with the dredged sludge as specified below;**

Identification No. of Cross Bar	Location	Length (metre)	Physical details Width (metre)	Top Elevation (m PWD
Cross Bar-1	BRE Km. 162.50	1300.00	30	+ 16.00
Cross Bar- 2	BRE Km. 165.00	1145.00	30	+ 16.00
Cross Bar-3 (Closure-1)	BRE Km. 169.10	1720.00	30	+ 16.00
Cross Bar-4	BRE Km. 175.00	1170.00	30	+ 16.00

Construction of the Cross Bars has facilitated in reclamation of about **16 square kilometre** of valuable land at Upazila: Sirajgonj Sadar, Dist: Sirajgonj and it has created avenue for development of housing settlement, business centre, industrial park, tourist spot, farming etc. in the reclaimed land. However, the Cross-Bars have been threatening by the on rush of Jamuna River during flood and it has become major concern of the government to protect the Cross Bars and the reclaimed land. So, the proposed Protective Work is aimed at setting aside the Cross Bars from grasp of mighty Jamuna River and thereby protects the reclaimed land.

The work under the Contract mainly comprises earthwork in Cross Bar (with mechanical compaction to attain 90% maximum dry density), manufacturing of C.C Block, procurement of hard rocks/boulders, geo-bags & geo-textile fabrics etc, armouring of the Cross Bar/ Closure by controlled dumping of hard rocks/geo-bags/CC Blocks by Barges & placing CC Blocks in slopes of Cross Bars for a total length of about 5700 metre, construction of inspection road etc.

In order to implement the protection works of the 4(four) Cross Bar a Technical Specification has been prepared.

1.02 Drawings

1.02.1 Tender Drawings

All the drawing of works is enclosed in separate Volume as listed in the Section 9 of the Tender Documents. Final drawings may be delivered to the Contractor prior to the commencement of the works before “Work Programme be submitted”.

1.02.2 Final Drawings

The drawings attached to the Tender Documents (hereinafter referred to as “Tender Drawings”) accompany and form part of the Contract Documents. In addition to the Tender Drawings, Final Drawings may also be delivered by the Engineer to the Contractor for execution of work and such drawings shall thereupon become part of the Contract.

During the progress of the work, Drawings that will be issued by the Engineer prior to commencement of the Works and as necessity arises to supplement and/or supersede the Tender Drawings.

The Contractor shall scrutinise such drawings as issued from time to time to the Contractor. If any ambiguity, discrepancy or mistake is found in the drawings, the same shall be referred to the Engineer before proceeding with the works, and the Engineer’s decision on resolving such ambiguity, discrepancy or mistake shall be final, conclusive and binding.

1.02.3 Drawings and Calculations to be furnished by the Contractor

The Contractor shall at his own expense prepare detailed Construction Drawings of the individual works (hereinafter referred to as “Construction Drawings”) based on the Tender Drawings and the Final Drawings as needed for performance of the works. All Construction Drawings prepared by the Contractor shall be submitted to the Engineer for his approval. The drawings submitted by the Contractor shall be clear and complete. In addition to the above, the Contractor shall at his own expense prepare reinforcement drawings as needed for the performance of the works and shall be submitted to the Engineer for approval.

Fabrication, manufacture or construction of any part of the works shall not commence until the drawings have been approved and no change shall be made to any drawings so approved. If any changes needed during construction shall be informed by sending another set of revised drawing.

1.02.4 Right to Change Design and Drawings

When additional information regarding foundation conditions become available as a result of excavation work and further testing, and if found desirable to make changes in the alignment, cross-sections, dimensions or design to conform to such conditions, the Employer/Engineer reserves the right to make the necessary or desirable changes to the opinion of the Engineer.

1.02.5 “As-Built” Drawings

The Contractor shall submit three (3) sets of printed “As-Built” Drawings of the completed Works along with two (2) sets of CD to the Employer before the expiration of Defect Liability Period.

The “As-Built” Drawings shall clearly show the lines and dimensions of the permanent construction actually made based on the original design and/or change of design from time to time ordered by the Engineer or proposed by the Contractor and approved by the Engineer.

1.02.6 Measurement and Payment

All costs including Contractor’s margin, overhead, taxes, etc, incurred by the Contractor to provide and submit “As-Built” Drawings shall be deemed to be included in the provisional sum of Section.01, Item No. 1.02 of the Bill of Quantities (BoQ).

1.03 Setting-Out and Survey of the Works

The Contractor shall re-survey the Base Lines, Traverse Points, Bench Marks and confirm the co-ordinates and levels of the Stations before using them for setting out the Works. The Contractor shall immediately notify the Engineer of any discrepancies and shall agree with the Engineer any amended values to be used in the Contract, including replacement of any Stations missing from the original location.

The Contractor shall employ well-qualified and experienced surveyors for the execution of survey and setting-out works.

The Contractor shall be responsible for the setting-out centre-lines, longitudinal and cross sections of the ground, and position of the structures in accordance with the drawings. Before commencing the works for Cross Bars, protective works etc, the Contractor shall carry out topo-survey / bathymetric survey of all works and take levels for longitudinal profile and cross sections along the routes/locations in which the works are to be executed out at his own expenses. The Contractor shall use benchmarks approved by the Engineer for such survey works.

Along structures, embankments, or combination thereof, the Contractor shall install temporary benchmarks at intervals of 500m. Ground levels shall be taken jointly by the contractor and the Engineer’s representative both prior to commencing and after completion of earth works.

The Contractor shall carry out Engineering survey and draw the plan and cross section for all cross bars , protective works as below:

- longitudinal section
- Cross-sections at an interval not exceeding 50 m or as specified by the Engineer before and after the execution of the Works. The formation level shall be taken as reference while cross-sections shall cover at least a width as necessary for the Works to be constructed, including related earthworks.

All field-books, calculations, maps, etc. of the survey activities shall be handed over to the Engineer, immediately after the completion of the survey. All field data, derived from the survey activities, entered in the field-books, shall also be entered into EXCEL spreadsheet or a compatible spreadsheet in a format approved by the Engineer. The data shall be submitted on a CD.

No separate payment shall be made to the Contractor for the works to be carried out under this Sub-Clause 1.03.

1.04 Layouts and Schedules Provisional

The locations, levels and dimensions as shown on the Drawings or given in the design data or structure schedules are subject to amendment. The Contractor will be required to undertake surveys for confirmation of alignment and levels of flood embankments, cross bar , river bank protection works as detailed in this Section of the Document. Details of any such amendment or confirmation of the original design will be given by the Engineer or the Engineer's Representative during the course of construction.

1.05 Suppliers of Materials

Before ordering a material for any description intended for the Works, the Contractor shall submit the name of the maker or supplier proposed and details of the place of origin and specification of the material to the Engineer for approval. If requested by Engineer, the Contractor shall supply a copy of any such order place. The Contractor shall make necessary arrangements (e.g. jetty) at the construction side where needed for loading & unloading of his equipment, materials etc.

1.06 Natural Materials

The Contractor shall make all arrangements for locating, selecting and processing natural materials to comply with the Specification and shall submit to the Engineer for approval with full information regarding the proposed location well in advance of commencement of working of the materials. Approval of a source does not imply that all material in that source is approved.

1.07 Disruption of Local Communities

The Contractor shall take all measures necessary to avoid nuisance and disruption to local communities. In particular the Contractor shall ensure no damage is done to existing road, standing crops, pasture or woodland. trees etc. and that the Contractor's operations do not cause flooding or pollution hazards.

1.08 Delay and Increased Costs Due to Floods, Wash-out of Roads or Impassable Roads

Notwithstanding **Clause 45.1** of the General Conditions of Contract no extension of time or increase in the Contract Rates shall be granted to the Contractor if he is delayed or impeded in the completion of the Works or involved in additional costs by flood, cyclone, high river water levels, wash-out of roads or tracks or impassable roads.

1.09 Temporary works

Not less than fourteen days before commencing any portion of the Works, the Contractor, if ordered, shall submit to the Engineer for his approval complete drawings of all Temporary Works the Contractor may require for the construction of that part of the Works.

Notwithstanding approval by the Engineer of any design for the Temporary Works the Contractor shall be entirely responsible for their efficiency, security and maintenance and for all obligations and risks in regard to such temporary Works which are specified or implied in the Contract

1.10 Notice of Operation

The Contractor shall give full and complete written notice of all important operations, including setting out, to the Engineer sufficiently in advance to enable the Engineer to make such arrangements as the Engineer may consider necessary for inspection and for any other purpose. The Contractor shall not start any important operation without the written approval of the Engineer.

1.11 Supply of Fuel/Lubricant

The Contractor shall be responsible for arranging and ensuring that adequate supplies of High Speed Diesel (HSD), motor spirits, kerosene, lubricants and other petroleum produces are available at all times to meet his requirements for the purposes of or in connection with the contract; the Contractor's particular attention is drawn to this requirements as from time to time shortages and interruptions in the supply of fuel oils, etc occur in the region

1.12 Engineer's Requirements

The amount provided in the Bill of Quantities (BoQ) for the payment of costs associated with the **provision for refurbishment and upgrading of existing BWDB Rest House Building at Sirajganj for site office and Construction of Semi-pucca (Steel Truss Framing and roofing with corrugated zincalume sheet) Office Building at 72, Green Road Dhaka as per approved design**, equipping and maintenance of site offices and accommodation for the Engineer. **Details are described in Clause No. 1.29.**

Notwithstanding any provision made in this Clause or elsewhere in the Tender Document, **the Contractor shall provide suitable road transport (4WD Vehicle & 2W Motorbike)** as specified in **Appendix-A** for exclusive and full time use of the Project Director, Deputy Project Director, Engineer and his staff all through the duration of contract. The Contractor shall provide competent vehicle drivers, maintain, clean and fuel the transports. Allowance shall be made for personnel to work in shifts. **The Contractor shall also arrange Training of the Project Officials** on River training/ Protective Works of mighty rivers (like Brahmaputra) and Land Reclamation through River Dredging & Management of Reclaimed Land preferably in the countries in Europe as per Schedule attached in **Appendix-B**. **All costs for providing and maintaining the road transport and training to the Project Officials are deemed to be covered by the rates and prices of the overall items of works entered in the BoQ under the contract. No extra cost will be paid or no separate items of works for these works/services are provided in the BoQ.**

All costs including Contractor's margin, overhead, taxes etc, incurred by the Contractor to provide, construct, supply, fabricate, erect, install in accordance with the specifications mentioned elsewhere, shall be deemed to be included in the rates/price quoted in the Bill of Quantities (**Bill No.01**) of the respective items. All facilities shall be ready for occupation by the Engineer within one month after receiving the instruction.

If the Contractor fails to provide this service the Engineer shall be entitled to withhold the issue of Payment Certificate until the service is resumed.

1.13 Assistance to Engineer's Staff

The Contractor shall render all necessary assistance to the Engineer's staff and shall provide for checking the Contractor's setting-out and the measurement of the Works.

The Contractor shall provide such full time or part time surveyors as may be required. The cost of all labourers, surveyors, survey equipment and tools, for checking the setting-out and the measurement of the Works shall be covered by the Contractor's expense and no separate payment shall be made thereof.

1.14 Construction Programme

Within **fifteen (15)** days from the date of signing the Contract Agreement, the Contractor shall submit to the Engineer for approval a complete and practicable construction programme (**GCC Clause 42.1**) showing the orderly performance of the Works. The Construction Programme shall show in detail the proposed method of operations, including purchase and delivery of materials and equipment, as well as the construction. The Construction Programme shall show in a bar chart each major item of the Works on separate horizontal lines, sequence of operation and the period required for the completion of each activity. The Construction Programme shall when approved by the Engineer become a part of the Contract.

The construction programmes shall include the followings:-

- a. a statement giving the numbers and categories of supervisory and technical staff and skilled/unskilled labour to be employed on the Works;
- b. a list and type/details of Contractor's Equipment (including vehicles) which the Contractor proposes to employ on the Works stating whether they are to be acquired from inside or outside Bangladesh including schedule dates for order and delivery;
- c. a list detailing the purchase and delivery of materials and Plant from both inside and outside Bangladesh;
- d. details of the Contractor's methods of working for all operations including construction by sequence. The programme shall also indicate the proposed temporary flow diversions illustrating the sequence of various critical stages of construction;
- e. a statement and outline layout giving the proposals for location or locations and sizes of constructional camps, accommodation, offices, workshops and stores at the Site; and details of the programme for the construction of the works from the date of receipt of the Notice to Commence, including a complete resource allocation showing the number of units and allotted times for each unit of Contractor's Equipment, Plant, materials and labour allocated for each part of the works.

The construction programme shall be reviewed and revised if necessary at intervals mentioned in **GCC Clause 42.2**

No separate payment shall be made to the Contractor for complying with this Sub-Clause.

1.15 Reports, Meetings and Data of the Works

1.15.1 Monthly Report

The Contractor shall furnish Monthly Report to the Engineer, at the Contractor's own costs, at regular monthly interval and in a form and number of copies determined by the Engineer, with the followings:

- a. physical progress for the preceding month and estimated progress for the reporting month;
- b. completion schedules (target and actual) based on the approved Construction Programme;
- c. a tabulation of construction equipment, listing the major items and pieces of equipment which were utilised for performance of the Works during the preceding month;

- d. a tabulation of employees, showing the supervisory staff and the numbers of several classes of labourers employed by the Contractor in the preceding month; report covering the Plant and materials furnished by the Contractor for the Works; and
- e. any report which may be specifically asked for by the Employer and/or the Engineer.

1.15.2 Site /Work Meetings

The Contractor shall attend all the Site/Work Meetings whenever called by the Engineer.

1.15.3 Photographs and Videos

The Contractor shall make all arrangements to provide photographs in albums, but not pasted, showing the work progress and shall promptly supply one electronic copy and four printed copies of such photographs of 4R size, of such portions of the works in progress and/or completed as may be directed by the Engineer. Each print shall contain on its back the date and title of the view taken. The Contractor shall also take Videos of work sequences time to time and supply the same in a CD.

1.15.4 Audits by the Employer

The Contractor shall note that the Employer shall be entitled at its discretion to conduct audits in respect to :

- costs incurred in the event of termination; and any other costs that the Contractor claims from the Employer which are not specifically covered by the terms of the Contract.

The Contractor shall be obliged to keep accurate up-to-date accounts with records concerning the above items.

1.15.5 Measurement and Payment

No separate payment shall be made for preparation of all documents, correspondence, returns and reports etc., to be prepared by the Contractor and submitted to the Engineer and/or the Employer in accordance with the provisions of the Contract.

All costs including Contractor's margin, overhead, taxes, etc, incurred by the Contractor shall be deemed to be included in the unit rate of the Bill of Quantities.

1.16 Safety Measures and Public Convenience

The Contractor shall provide necessary protection for all persons and properties at all times. The Contractor shall comply with the stipulations of the safe construction methods specified in the "Safety Manual", to the extent that such provisions do not conflict with the applicable laws of Bangladesh. The Contractor shall take all necessary measures to protect the work and prevent accidents during the construction. He shall provide and maintain sufficient night-lights, barricades, guards, temporary sidewalks, temporary bridges, danger signals, watchmen and necessary alliances and safeguards to properly protect life and property. He shall also protect all excavations, equipment and materials so that the public are not be endangered.

No separate payment shall be made to the Contractor in complying with the provisions of this Sub-Clause.

1.17 Precautions

The Contractor is to execute the Works in such a manner that he does not damage or interfere with existing services which are located in proximity to the Site. The Contractor shall be responsible for any damage or interference which may be caused to these services due to execution of the Works and shall carry out all necessary repairs at his own expense and to the satisfaction of the Engineer.

No excavating machines shall be used in the immediate surroundings of cables and/or pipelines, unless approved by the Engineer.

Temporary Works which have to be made in the surroundings of the system during the execution of works, shall be maintained by the Contractor and shall be removed as soon as practicable.

1.17.1 Interference with Existing Works

The Contractor shall not interfere in any way with any existing works whether they are the property of the Employer or of a third party and whether the position of such works is indicated to the Contractor by the Engineer or not, except where such interference is specifically described as part of the Works either in the Contract or in the Engineer's instructions.

The Contractor shall at his own expense provide and erect to the approval of the Engineer such supports as may be required to protect efficiently all structures or works which may be endangered by the execution of the Works and he shall remove such supports on completion of the Works or otherwise take such permanent measures as may be required by the Engineer to protect the structures or works.

1.18 Signboard

The Contractor shall erect a **Signboard** of a size of not less than 2 m by 3 m at work site. The signboard shall be erected at a suitable place prior to the commencement of the work and to be maintained in good condition during the whole contract period. All information on the Signboard will be written in English and Bengali. Each **Signboard** shall show the following:

- (i) the name of the Project
- (ii) the name of the Employer
- (iii) all other details of the Contract or as directed by the Engineer

No separate payment shall be made for the provision of the **Signboard**.

1.19 Clean Up the Site

Prior to the issue of the latest Defect Liability Certificate by the Employer the Contractor shall remove from the Site all plant and equipment, tools, rubbish, concrete forms, boulders, bricks and other materials not incorporated in the permanent works.

No separate payment shall be made to the Contractor for complying with the provisions of this Sub-Clause.

1.20 Contractor's Offices, Workshops, Accommodations, Laboratory etc.

The Contractor shall be responsible for the land he deems necessary for his offices, stores, warehouse, motor pool, laboratory, workshops, pre-cast concrete factory, staff quarters and labour camp. Separate accommodation and toilet facilities to be kept for male and female workers. The Contractor shall be also responsible for construction, maintenance, operation of such temporary facilities as his office, stores, warehouse, motor pool, laboratory, workshops, pre-cast concrete factory, staff quarters and labourer camps including feeding and accommodation. These facilities shall be equipped with adequate electricity and potable water supplies. Bangladesh labour law would be strictly followed in administering the workers (labours). The Contractor shall also keep sufficient first aid kit and preventive medicines of viral and waterborne diseases. **Details are described in Clause No. 1.30.**

The Contractor shall submit for approval of the Engineer within fourteen (14) days from the date of the Notice to Commence his detailed plan and/or construction drawings of his offices, stores, warehouse, motor pool, workshops, pre-cast concrete factory, staff quarters, labourer camps and field laboratory that he proposes to construct or rent, including his proposals for water and power supply and sewage facilities and Inspection Sheds. All buildings and facilities shall conform to the Employer's standards.

In this connection Tenderers are specifically informed that there are some existing facilities of about 673.42 sqm in form of semi-permanent (brick wall with CI Sheet Roofing/CI sheet walling & roofing) Work Shop, Store, and Residence, Office in unused condition which needs some appreciable refurbishment works in the BRE (Specialised) O&M Division Premises, Serajgonj, are almost located at the central position of the proposed Protective Works Sites. The space and the existing facilities as in place conditions will be made available to the Contractor free of cost. So, the Tenderers are advised to take these aspects into account while working out tender pricing. A Sketch showing the existing facilities are shown in Appendix-C.

Beyond the space as mentioned above, arranging of land that deemed necessary in fulfilment the obligations under this Clause shall be the full responsibilities of the Contractor.

All costs including Contractor's margin, overhead, taxes, etc, incurred by the Contractor in complying with requirements of this Clause shall be deemed to be included in the lump sum price of Contractor's facilities of the Bill of Quantities **(Item No.1.02)**. Payment for this item shall be made on pro-rata basis depending upon the total progress accomplished.

1.21 Quality Assurance Plan

The Contractor shall within twenty-eight (28) days from the date of the Notice to Commence submit a **Quality Assurance Plan**. The plan shall include testing schedules, list of material sources, quality control procedures and other items as required by the Engineer. The Contractor shall implement the quality control procedures in compliance with the approved Quality Assurance Plan.

The Contractor shall also provide testing equipment and apparatus and furnish all testing staff, labours and consumable necessary for carrying out his testing. All the costs incurred in operation of testing shall also be borne by the Contractor.

The Contractor shall when requested by the Engineer or the Engineer's Representative carry out any test.

1.22 Standards and Supplemental Specifications

Unless otherwise stated in the Contract, all workmanship, materials, and equipment shall comply with the relevant American, British and Bangladesh Standard viz. AASHTO, ACI, AISC, ASTM, AWS AWWA, BSI, DIN, DNA, ISO, and SSPC, U.S. Fed. Spec and USBR

Wherever reference is made in the Contract to specific standards and codes to be met by the materials, Plant, and other supplies 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 shall apply, unless otherwise expressly stated in the contract.

1.23 Sanitation

The Contractor is to arrange for a high standard of sanitation to be maintained throughout the Camp and the Work sites. He shall construct and maintain at his own cost a system of surface drainage and waste disposal. Sanitary conveniences for the use of persons employed in the works shall be provided and maintained by the Contractor in accordance with the appropriate laws and regulations in force in Bangladesh to the extent and in such a manner and at such places as may be approved by the Engineer, and all persons connected with the works shall be obliged to use them.

1.24 Medical Arrangements and First Aid Facilities

The Contractor shall make arrangements according to the regulations in force in Bangladesh for treatment on the site of casualties and sick persons. The Contractor shall make his own arrangements for treatment of casualties on the Site in such first-aid units as may be thought necessary.

In addition, the Contractor shall manage and operate appropriate ambulances for the transportation of injured or sick employees to nearby hospitals. This facility shall be available for the Employer's, Engineer's, Subcontractors' and Contractor's personnel and workmen.

No separate payment shall be made for this provision.

1.25 Construction and Maintenance of Temporary Access Road

The Contractor shall construct and maintain the temporary access roads including temporary access bridges necessary for construction of the Works and transportation of the materials. The Contractor shall also pay compensation to the owner(s) if he constructs the temporary access roads on a privately owned land.

The public and village roads may also be used as temporary access road. The Contractor shall maintain and repair them to the satisfaction of the authorities concerned.

The Contractor shall facilitate the use of such roads for other contractors of the Project and public in a friendly co-operative manner without maintenance of the roads required by them.

All costs including Contractor's margin, overhead, taxes, etc, incurred by the Contractor in complying with requirements of this Clause shall be deemed to be covered in the lump sum price of Contractor's facilities of the Bill of Quantities (**Bill No.01, Item No.1.02**). Payment for these items shall be made on pro-rata basis depending upon the total progress accomplished.

1.26 Environmental Mitigation Works

The Environment is defined to mean surrounding area including human and natural resources to be affected by execution and completion of Works.

The Contractor shall take all precautions for safeguarding the environment during the course of the construction of the Works. The Contractor shall fully comply with the environmental protection mitigation measures specified in the related EIA Guidelines published by the Ministry of Environment and Forests, of Government of Bangladesh.

The Contractor shall prohibit employees from unauthorised use of explosives, poaching wildlife and cutting trees. The Contractor shall be responsible for the action of his employees. The Contractor shall plan his works in such a way that there is no spillage of petroleum products to the surface or sub-surface water. The Contractor shall provide requisite devices in all his equipment and machineries to diminish carbon dioxide coming out during operation of the equipment and machineries.

1.27 Insurances

For fulfilling the obligations under **Clause No.37** of the General Conditions of Contract, the Contractor shall maintain Insurances of Works, Plants, and Third Party etc. of the figure and amount stated in the relevant PCC which shall be deemed to include all the Contractor's costs incidental to providing the specified insurance.

1.28 Permits, Licenses or Approvals:

The Contractor shall, in performing the Contract, comply with the applicable Laws of Bangladesh. The Contractor shall give all notices, pay all taxes, duties and fees, and obtain all permits, licenses and approvals, as required by the applicable Laws in relation to the execution and completion of the Works and the remedying of any defects.

Contractor shall be allowed to re-export, out of Bangladesh, his equipment, including essential spare parts therefore, and any material imported by the Contractor for the sole purpose of executing the Contract, on completion of the contract. If the Contractor wishes to dispose them of locally, subject to the local laws, BWDB shall be given first preference to purchase at the negotiated price. Import and re-export of equipment, including essential spare parts will be subject to applicable laws of National Board of Revenue (NBR).

GENERAL: EMPLOYER'S REQUIREMENTS

1.29 Engineer's Site Facilities

The Contractor shall be responsible for the provision, maintenance and operation of the following facilities and services for Engineer.

(a) Refurbishment and upgrading of existing one storied BWDB's Rest House Building (**Site Plan is attached in Appendix-D**) at Sirajganj under Sirajganj O&M Division into two storied Building for Engineer's Site Office with tiles on floors and walls (Toilet), aluminum windows with glass pane, window grill, wooden door shutters, providing appropriate plumbing, sanitation, electrification(with standby Generator of 10 KVA) and potable water supply facilities equipped with standard furniture & fixtures and fitting, supplying and fitting fixing of **brand new air cooler of appropriate capacity in each room , a standard Refrigerator** including fixing of all accessories, lifting pump and erection of overhead tank, supplying of crockery and other utensils for cooking and dining facilities and bedding materials etc. The Contractor shall submit plans and designs of the refurbishment and upgrading works for approval by the Project Director/Deputy Project Director, PMU, CDRSB, BWDB, Dhaka .All equipment/articles/utensils/ furniture & fixture/materials must be of best quality and should

have got approved beforehand by the Project Director/Deputy Project Director, PMU, CDRSB, BWDB, Dhaka.

The contractor shall have to submit a preliminary design/drawing of the proposed refurbishment and up-gradation of existing one storied BWDB's Rest House Building with their Tender.

Existing BWDB Rest House at Sirajganj = 160 Sqm (approx.)

The Rest Houses shall be furnished with minimum of the following Furniture and Fixtures

- (i) Wooden Cot with mattress, bed-sheet, pillow cover, curtain, blanket etc 8 set
- (ii) Wooden Almirah 8 Nos.
- (iii) Wardrobe 8 Nos.
- (iv) Dressing Table 8 Nos.
- (v) Wooden Sofa set with foam and covers 14 Nos.
- (vi) Wooden Dining Table and Chair for 8 people 1 Set
- (vii) Curtain for Door and Window 50 sets.
- (viii) Wooden Table 8 Nos.
- (ix) Wooden chair 14 No

On completion of the Contract all the equipment/ articles/furniture-fixture etc. will be assets of the owner.

- (b) Maintain the facilities in Engineer's Site office at Sirajganj during the construction period, which include but not limited to utility bills (electricity, water, sewerage) and repair and replacement of any damaged item (within 24 hours), supply of LP Gas Cylinder, toiletries and all other consumables etc.

- 12 months

(c) Construction Semi-pucca Building ((Steel Truss Framing and roofing with corrugated zinalume sheet)) at 72, Green Road, Dahka on BWDB's own land (Plan of the proposed Building is attached in Appendix-E) with tiles on floors and walls (Toilet), aluminum windows with glass pane, window grill, wooden door shutters, providing appropriate plumbing, sanitation, electrification (with standby Generator of 10 KVA) equipped with standard furniture & fixtures and fitting, supplying and fitting fixing of brand new air cooler of appropriate capacity in each room including fixing of all accessories, lifting pump and erection of overhead tank etc. as per approved design for PMU,CDRSB Office Building with all fittings & fixings of high quality. The Contractor has to prepare the detailed design of the Office Building which is to be approved by the Project Director/Deputy Project Director, PMU, CDRSB, BWDB, and Dhaka. All equipment/articles/utensils/ furniture & fixture/materials must be of best quality and should have got approved beforehand by the Project Director/Deputy Project Director, PMU, CDRSB, BWDB, Dhaka.

The contractor shall have to submit a preliminary design/drawing of the Semi-pucca Building with their Tender.

Semi-Pucca Office Building to be constructed at 72, Green Road, Dhaka- 382 Sqm (minimum)

The Office Building shall be furnished with minimum of the following Furniture and Fixtures

- (i) Steel Almirah - 10 Nos

- (ii) Steel Chest of Drawers - 10 Nos
- (iii) Wooden Table - 10 Nos.
- (v) Full Secretariat Table - 10 Nos
- (vi) Half Secretariat Table - 10 Nos
- (vii) Chair (executive) - 10 Nos
- (viii) Chair (cushion) - 10 Nos

1.30 Contractor's Site Facilities

(1) The Contractor shall be responsible for the provision, maintenance, operation and subsequent removal of the following facilities and services on site at his own expenses:

- (a) Temporary stores (including godowns for cement and other perishable materials), warehouse and workshop; Temporary buildings for office accommodation for his staff;
- (b) Living accommodation for his staff;
- (c) Fencing, lighting and guarding;
- (d) Crane or other means of off-loading plant and equipment, placing in temporary storage and moving from storage to equipment locations;
- (e) Site transport for his staff;
- (f) Electric supply for temporary buildings and tools;
- (g) Installation of deep-tube well (with treatment and filtering arrangement) and shallow-tube well for site works and provision of adequate potable water.
- (h) Establishment of Site Laboratory to carry out the following Test:
 - Moisture Content (STP 4.3)
 - Atterburg Limits (STP 3.2), (Casagrande Apparatus)
 - Particle Size Distribution
 - CBR
 - Modified Compaction of Soil
 - In-situ density by sand replacement
 - Flakiness Index
 - Fineness Modulus,
 - ACV,
 - Slump Test
 - Concrete Compressive Strength,
 - Fineness of cement
 - Setting time of cement
 - Cement Strength

In addition to equipment required for carrying out above tests at Site Laboratory, the Contractor shall provide the following equipment;

- 3 Nos. 'Speedy' moisture tester (calcium carbide type) with Chemicals
- 3 Nos Dynamic Cone Penetrometer (DCP)
- 4 Nos Concrete Rebound Hammer(Smith Hammer)
- 1 Nos Sieve Shaker

- 1 Set Sieve for fine Aggregate (Brass Frame and Stainless steel cloth mesh for testing sand with trays)
- 1 Set Sieve for Coarse Aggregate (200 mm dia. Brass Frame and Stainless steel cloth mesh for 40 mm down graded aggregates with trays).
- 1 Set Apparatus for compaction test of earth (Sand cone, Balance, Mould etc. as required for the test)
- 4 nos Clegg Impact Soil Tester. 50 mm, 10 kg)
- 1 Set Modified Proctor Density/Moisture (4") Split Mould
- 4 Sets Apparatus for slump test of concrete
- 4 Sets Cylinder Mould (6" dia and 12 " height Cylinder mould , each set comprises 6 Nos Mould) for sampling of concrete
- 4 Nos. Steel scale (12" steel scale),
- 4 Nos. Funnel (Aluminium funnel, use with all slump cones to assist in filling).

Contractor shall bear all Contingency and Laboratory testing charge as may be required for Geo-textile, Concrete, Hard Rock and other materials from BUET or any other recognized Laboratory as will be selected by the Engineer.

The Contractor when requested by the Engineer or his Representative to carry out any test in the presence of the Engineer or his Representative, shall provide all necessary assistances in carrying out the tests providing concerned Material Engineer, Laboratory Assistants and labours required to the Engineer free of charge. The Contractor shall ensure that the Engineer and his staff have unrestricted access to these facilities free of charge

Testing equipment and apparatus as are needed for the performance of the above tests as specified in the Technical Specifications for the materials and construction of earthworks, concrete, gravels etc. are to be supplied by the Contractor. **After completion of the contract, with all equipment & apparatus are to be handed over to BWDB for future use;**

All costs including Contractor's margin, overhead, taxes, etc, incurred by the Contractor in complying with requirements of this sub-clause shall be deemed to be included in the lump sum price of Contractor's site facilities of the Bill of Quantities **(Item No.1.02)** Payment for this item shall be made on pro-rata basis depending upon the total progress accomplished. Prior approval from the Engineer will be required for utilization of this sum.

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TECHNICAL SPECIFICATION

2.1 Earthwork in Construction / Re-sectioning of Embankment	2.1.1 General Construction / Re-sectioning of Embankment/Spur consist of furnishing, placing and compacting materials to the lines and grades shown on the Drawings or as directed by the Engineer. It includes collecting suitable soil, throwing to a profile in layers not exceeding 230mm in thickness, breaking clods, benching the side slopes, stripping the base of embankment and borrow pit area, dug bailing, profiling, cutting trees up to 200mm girth with uprooting stumps, clearing jungles, mechanical compaction, bailing out of water, rough dressing and 150mm cambering at the centre of the crest etc. complete as per design, specification and direction of Engineer in charge.
	2.1.2 Materials The material to be used for Construction / Re-sectioning of Embankment/Spur shall be suitable earth and shall not contain any stumps, peat, logs, weeds, roots, clods, or any organic matter that may decay and shall be capable of being compacted to the required standard. The soil shall be with minimum 16% clay, 0-60 % silt and 0-30% sand. The material shall be tested in authorized laboratory to ascertain its grain size distribution, liquid and plasticity. Liquid limit of soil passing 0.425 mm sieve shall not exceed 50% (STP-3.2: Atterberg Limits) and Plastic Limit passing 0.424 mm sieve shall not exceed 25% (STP-3.2: Atterberg Limits). The moisture content of fill materials before compaction shall be within +/- 5% of the optimum moisture content as determined in accordance with STP 4.4 (Standard Compaction Modified hammer of 4.5 Kg). One density test for each 1000 square meter of a completed layer will be carried out according to STP 6.2 (Sand Replacement Method), unless otherwise directed by the Engineer. The clods of the earth shall be broken down to a maximum size of 100mm before compaction operation.
	2.1.3 Earth borrowed from river bed by dredging or any other means Because of unavailability of borrow land, all earth required for constructing/Re-sectioning of the embankments shall have to be borrowed from the river bed using Dredger or any other means managed by the Contractor and approved by the Engineer within a distance of 5 km. The initial distance for borrowing earth is 0.00 m to 1.00 km and subsequent distance for extra payment is beyond 1.00 km to 5.00 km . The contractor shall be bounded under this sub-clause to arrange Dredgers/appropriate equipment, lease or purchase of private land for disposal of dredged/excavated spoil. The location of river bed from where earth will be borrowed and quality of earth must have prior approval from Engineer. The excavation/dredging of river bed for collecting of soil shall be done following the approved cross section of the river supplied by the Engineer. The borrowed material from the river bed before being used in constructing the embankments/spur shall be retained in temporary disposal yard until its moisture content attains +10%. The Contractor shall undertake construction of palisade works, bunds and intermediate bunds, uninterrupted and controlled passage of waste water and other activities as are required to retain the borrowed/dredged material in the temporary disposal yard. The Contractor shall carry out operation in discharging of water from the

	temporary heap/disposal areas without disturbance to existing works, structure, flood embankments, river bank and farm land etc. Pipelines required for disposition of fill materials shall be laid along routes and corridors approved by the Engineer. Any road or river crossings of pipelines shall be constructed so as to minimize interference of all types of traffics both during construction and operation of pipelines
	2.1.4 Construction Procedure i. The Contractor shall plan all fill works to allow for delays in preparing, compaction and testing for compaction,, allow for drainage, stockpiling, mixing with dry material or watering to enable the material to be placed in the fill work at the appropriate moisture content for compaction to be effective, take all appropriate and necessary measures to ensure that the filling is undertaken in self-draining layers. ii. The Contractor shall submit to the Engineer for his approval the details of his proposed method of obtaining embankment materials at least seven (7) days ahead he intends to commence the works. The Contractor shall not commence any filling work necessary for Construction / Re-sectioning of Embankment until the Engineer's approval regarding suitability of filling materials and foundation of the embankment has been obtained. iii. Unsuitable material shall be stripped from the embankment foundation. The area shall then be scarified or ploughed prior to placing of any fill material. iv. All foundations of fill works shall be inspected and approved by the Engineer before filling commences. v. The embankment toe shall be marked by nicking out lines 75mm deep and 75mm wide. vi. The embankment height shall be raised uniformly at all stages during construction. Each layer shall have to maintain a camber at the center during filling so that rain water can drain smoothly from the top of the embankment with no pockets of stagnant water. The crest of the embankment shall be provided with 150 mm cambering at the centre. vii. In Re-sectioning of existing embankment, the new fill material shall be fully keyed into the old embankment by means of stripping and benching which shall be in steps, each not less than 300 mm high and 600 mm wide. Steps shall be cut in advance of the filling. viii. The contractor shall make model sections at 500m interval and as per requirement of the Engineer. The model sections should have a length of at least 50m and full height of the embankment. The contractor will notify the Engineer and submit a complete 'working plan' describing location of the embankment, staff and labor, tools and plants, quantity of earth work, means of handling and placing etc. No work shall be started until the Contractor's working plan has been approved in writing by the Engineer. ix. Notwithstanding the Engineer's approval of any of the Contractor's equipment or methods, the Contractor shall at all times be solely responsible for executing the works in accordance with the Specifications.

	x. For embankments, if the results of the field density tests show less than the specified density (85% maximum dry density at optimum moisture content with reference to laboratory density test AASHTO modified hammer) in a certain layer, the whole reach will be rejected and re-compaction shall be required. Successive layers shall not be placed until the layer under construction has been approved by the Engineer. xi. The Contractor shall provide necessary equipment, labour and transport for carrying out the sampling and testing in the Site laboratory. The soil samples shall be stored and tested at the Site laboratory under the supervision of the Engineer.
	2.1.5 Mechanical Compaction i. Embankments shall be mechanically compacted to the lines and grades shown on the Drawings or established by the Engineer. ii. The material to be compacted shall be deposited in horizontal layers not more than 230 mm thick, and the distribution of materials shall be such that the compacted material will be homogeneous and free from lenses, pockets, streaks or other imperfections. The placing operations shall be such that the materials when compacted will be blended sufficiently to secure the best practicable degree of compaction, impermeability and stability, and for this reason the preceding compacted layer shall be scarified before placing the new layer. iii. Each layer of material shall be compacted uniformly by use of adequate and appropriate compaction equipment (Compaction will be done by the contractor with bull dozer / sheep Foot Roller / Vibro hammer). Compaction shall be done in a longitudinal direction along the embankment and generally begin at the outer edges and progress towards the center in such a manner that each receives equal compaction effort. iv. The material shall be compacted to attain 85% maximum dry density at optimum moisture content with reference to laboratory density test AASHTO modified hammer. The Engineer will take samples of the material being compacted for each 500 m compacted length of embankment (1 sample for each 1000 square metre area compacted in each layer) and will perform tests required to determine that the compaction is meeting the requirements of these Specifications. The Contractor shall provide all necessary aid to the Engineer in obtaining representative samples for testing and performing test at no extra cost. v. The in situ dry density of the compacted fill shall be determined by the sand replacement method described in Test No.15 of BS 1377 or similar approved test to be conducted by Nuclear Gauge Recorder at locations ordered by the Engineer.

	2.1.6 Measurement Embankment shall be measured in cubic meters based on the cross sections of accepted embankment/spur constructed and completed in accordance with the Specifications, to the lines, levels and grades required or as directed by the Engineer. Quantity of Earth borrowed beyond (the initial distance of 1.00 km) 1.00 km to 5.00 will be recorded separately and paid under extra item as provided in the BoQ. 2.1.7 Payment Payment for construction/re-sectioning of embankment/spur shall be made in cubic meters both for initial distance and extra beyond the initial distance at the rate as provided in the BoQ on the basis of measurement.
2.2 Providing Clay Blanket over Embankment Crest and Slope	2.2.1 Description Providing clay blanket over embankment crest and slope consist of furnishing, placing and compacting clayey soil to the lines and grades shown on the Drawings or as directed by the Engineer. It includes collecting suitable clayey soil by Boat or Truck or any other means up to a distance of 5 km, benching the side slopes, stripping the existing embankment and borrow pit area, throwing to a profile in layers not exceeding 150mm in thickness, breaking clods, compacting the materials, rough dressing and 150mm cambering at the centre of the crest etc. complete as per design, specification and direction of Engineer in charge. The initial distance is considered to be between 300 m to 1.0 km. Beyond 1 km up to 5 km extra payment will be made as per work done and provided in the BoQ 2.2.2 Materials The material to be used for Providing clay blanket over embankment crest and slope shall be suitable clayey soil and shall not contain any stumps, peat, logs, weeds, roots, clods, or any organic matter that may decay and shall be capable of being compacted to the required standard. The soil shall be clayey with minimum 80% clay, 0-20% silt. The moisture content of fill materials before compaction shall be within +/- 5% of the optimum moisture content as determined in accordance with STP 4.3 (Standard Compaction). One density test for each 1000 square meters of a completed layer will be carried out according to STP 6.2, unless otherwise directed by the Engineer. The clods of the earth shall be broken down to a maximum size of 100mm before compaction operation. 2.2.3 Borrow Area The materials used for clay blanket shall be obtained from borrow areas proposed and managed by the Contractor but approved by the Engineer. The borrow area shall preferably be located on the river side of embankment and the minimum set back distance shall be 20m from the toe of the embankment. If the Contractor choose the borrow area at the country side of the embankment, the minimum set back distance shall be 50m from the toe of the embankment. The maximum depth of the borrow area shall be approved by the Engineer 2.2.4 Construction Procedures

	i) The Contractor shall plan all fill works to allow for delays in preparing, compaction and testing for compaction,, allow for drainage, stockpiling, mixing with dry material or watering to enable the material to be placed in the fill work at the appropriate moisture content for compaction to be effective, take all appropriate and necessary measures to ensure that the filling is undertaken in self-draining layers. ii) The Contractor shall submit to the Engineer for his approval the details of his proposed method of obtaining materials at least seven (7) days ahead he intends to commence the works. The Contractor shall not commence any filling work necessary for providing clay blanket over Embankment until the Engineer's approval regarding suitability of filling materials and top of the existing embankment has been obtained. iii) Unsuitable material shall be stripped from the top layer of the existing embankment. The area shall then be scarified or ploughed prior to placing of any fill material. iv) The existing embankment required for providing clay blanket shall be inspected and approved by the Engineer before filling commences. v) The fill material shall be fully keyed into the old embankment by means of stripping and benching which shall be in steps, each not less than 300mm high and 600mm wide. Steps shall be cut in advance of the filling. Each layer shall have to maintain a camber at the center during filling so that all water shall drain freely from the embankment with no pockets to collect water. The crest of the embankment shall be provided with 150mm cambering at the centre.
	2.2.5 Mechanical Compaction i) Clay blanket shall be mechanically compacted to the lines and grades shown on the Drawings or established by the Engineer. ii) The material to be compacted shall be deposited in horizontal layers not more than 230 mm thick, and the distribution of materials shall be such that the compacted material will be homogeneous and free from lenses, pockets, streaks or other imperfections. The placing operations shall be such that the materials when compacted will be blended sufficiently to secure the best practicable degree of compaction, impermeability and stability, and for this reason the preceding compacted layer shall be scarified before placing the new layer. iii) Each layer of material shall be compacted uniformly by use of adequate and appropriate compaction equipment (Compaction will be done by the contractor with bull dozer / sheep Foot Roller / Vibro hammer). Compaction shall be done in a longitudinal direction along the embankment and generally begin at the outer edge and progress towards the center in such a manner that each receives equal compaction effort. iv) The material shall be compacted to attain 85% maximum dry density at optimum moisture content with reference to laboratory density test AASHTO modified hammer. The Engineer will take samples of the material being compacted for each 1000 square meter compacted area and will perform tests required to determine that the compaction is meeting the requirements of these Specifications. The Contractor shall provide all necessary

	aid to the Engineer in obtaining representative samples for testing and performing test at no extra cost. v) The in situ dry density of the compacted fill shall be determined by the sand replacement method described in Test No.15 of BS 1377 or similar approved test at locations ordered by the Engineer.
	2.2.6 Measurement The quantity measured for payment shall be in cubic meters based on the cross sections not exceeding 50 m apart of accepted embankment constructed, completed and compacted in accordance with the Specifications, to the lines, levels and grades required or as directed by the Engineer. Collection of Clay blanket beyond the Initial distance of 1 Km up to 5 km will be measured and recorded separately under separate item as provided in the BoQ 2.2.7 Payment Payment for clay blanket on embankment shall be made at the unit rate per cubic meter as included of the Bill of Quantities. The unit rate shall include all costs of materials, stripping, benching, placing materials in layers, moistening or drying the materials, compacting including all costs of labour, materials and construction equipment. Payment for collection of Clay blanket beyond the initial distance of 1 km up to 5 km shall be paid at as the extra rate under separate item as provided in the BoQ
2.3 Fine Dressing and Close Turfing	2.3.1 Description This work shall consist of furnishing all topsoil, grass and fertilizers and placing and incorporating the same on embankment slopes and other locations shown on the Drawings or directed by the Engineer. Fine dressing and Close turfing including ramming, watering until the turf grows properly, maintaining etc. on the slopes and the crest of embankment should be done with 75mm thick good quality durba or charkanta sods of size 200mmx200mm. Other grass types (like vetiver) proven to grow well under the local conditions may also be used subject to the prior approval of the Engineer. 2.3.2 Material Grass shall be harmless inoffensive to person and animals and not of a kind recognized as a nuisance to agriculture. It shall be free of disease and noxious weeds, deep rooted and sufficiently rapid growing and spreading to give complete cover over the planted area within the final construction inspection period. 2.3.3 Construction Procedure i) The crest and slope of the embankment shall be shaped to slopes and levels, fully compacted then fine dressed with approved top soil in a layer of not less than 50 mm thick before being covered by good quality Durba grass turf or a similar approved turf from a source approved by the Engineer. The turf should be approximately 200 mm x 200 mm x 75 mm thick and be placed

	close together in a staggered pattern with 100% coverage. The turfs shall be set firmly into the top soil dressing and watered immediately after planting, then daily until the grass is well established and new growth is clearly visible. ii) Sodding or turfing shall be planted with their root system substantially undamaged, well buried in firm material, and packed around the moist earth in which they have grown. iii) Grass planting shall be started well in advance of the monsoon season to ensure establishment of growth before the rain sets in and shall not be performed when ground is muddy or when the soil or weather condition would otherwise prevent proper soil preparation and subsequent operations. iv) The contractor shall be responsible for satisfactory growth and shall water, fertilize, and mow the grass to ensure 100% ground coverage of live grass all through the defect liability period. v) Fertilizer shall be approved lime or mixture of plant nutrients or both. Fertilizer shall consist of standard commercial material such as Nitrozen – Phosphate- Pottasium shared in ratio 16:5:12 or in other suitable ratio. The application rate shall be determined through soil analysis of soil sample taken from the area to be grassed. vi) All sodded areas shall be watered until the grass grows fully. Areas that do not grow or wash out shall be repaired and returned with fresh sods at the Contractor's expense.
	2.3.4 Measurement The quantity measured for payment shall be in square meters of finished and accepted well grown grass only.
	2.3.5 Payment Payment of the item shall be made at the unit rate per square metre as included in the Bill of Quantities. The unit rate shall include all cost of furnishing labour, material, incidentals for carrying out the work including preparation of grass-bed, and planting of grass as specified, fertilizing, watering, maintenance and all other procedures specified herein.
2.4 Cutting & Filling of Eroded Bank of	2.4.1 General Cutting and filling of eroded river bank shall mean the removal/filling of materials so that revetment can be constructed to the lines, grades and dimensions shown on the Drawings. The Contractor shall prepare, submit and obtain approval from the Engineer for bank revetment plans including pegging at site showing the alignment of the proposed revetment. The alignment of the revetment slope may be adjusted, subject to the approval of the Engineer, to minimize the amount of fill without compromising the stability of the existing embankment
	2.4.2 Cutting, Filling & Compaction The eroded bank shall be cut and filled to design slope by leveling, dressing and compacting the earth in 150 mm layer by vibratory soil compactor as per direction of Engineer

	2.4.3 Spoil Earth Excavated materials, which meet the specification of fill work, shall be utilized for the fill work and remaining materials shall be utilized for either rising of the bank elevation or ditch filling inside the slope and nearby area. Excavated material shall not be dumped at the top edge of cut slopes. Necessary permission shall be sought from the Engineer, the location where the excavated materials will be used.
	2.4.4 Over Excavation Except as may be directed by the Engineer, excess cutting for the convenience of the Contractor or over excavation performed by the Contractor for any purpose or reasons, shall be at the expense of the Contractor. If the excavation exceeds the depths specified, back filling with proper compaction shall be undertaken as fill works at the expense of the Contractor. If back filling is to be undertaken it shall be done by sand (FM 1.00 to 1.50) filled gunny bags as directed by the Engineer.
	2.4.5 Unsuitable Materials i) When the specified levels or limits of cutting are reached, the Engineer will inspect the ground exposed. If the Engineer considers that any part of the ground is by its nature unsuitable, he may direct that the unsuitable material be further cut to a depth from the lowest level shown on the Drawings or as directed by the Engineer and be replaced by a suitable backfill approved by the Engineer. ii) If the materials forming the bottom of any excavations become unacceptable to Engineer due to exposure to weather condition or due to flooding or have become puddle, soft or loose during the process of the works, the Contractor shall remove such damaged softened, or loosened material and excavate further. Such further excavation shall be held to be excess excavation and the cost of the excess excavation and subsequent replacement with a suitable backfill and compaction shall be at the expense of the Contractor
	2.4.6 Toe Foundation The toe foundation shall be either excavated or built up to the lines and levels shown on the drawing with proper compaction.
	2.4.7 Measurement The quantity measured for payment shall be in cubic meters based on Pre-work and Post-work cross sections not exceeding 50 m apart of accepted bank length constructed and completed in accordance with the Specifications, to the lines, levels and grades required or as directed by the Engineer
	2.4.8 Payment Payment of the item shall be made at the unit rate per cubic meter as included in the Bill of Quantities. The unit rate shall include all costs of alignment fixing, profiling, and excavation, fill work, placement of spoils at specified distance including all costs of labour, materials and construction equipment.
2.5 Manufacturing and Supplying Cement Concrete (CC) Blocks	2.5.1 General Pre-cast concrete blocks shall be made to the dimensions shown on the

Drawings or as specified in the Bill of Quantities. The materials and workmanship shall comply with the specifications in all respect and to the satisfaction of the Engineer. Except otherwise shown on the Drawings, precast concrete blocks (cc blocks) shall be **made from concrete having minimum cylinder strength at 28 days of 9.0 N / mm² for Protective Work** and cast in moulds formed from steel sheet. The moulds shall be sufficiently tight fitting to prevent grout losses and sufficiently rigid to withstand the effects of placing and vibratory the concrete without distorting and capable of releasing the hardened concrete blocks without causing damages to the blocks.

2.5.2 Cement

- i) The cement used in the Works shall be Ordinary Portland Cement complying with BS BN 197-1:2011. The cement shall be delivered to the site of the Works in sound and properly sealed bags. The Contractor shall provide from each consignment of cement, delivered to the site, such samples as the Engineer may require for testing.
- ii) In addition to the tests required in BS BN 197-1:2011, 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. Cement showing lumps which cannot be broken to the original fineness by finger pressure will be rejected irrespective of age and shall be removed from the site.
- iii) Any cement which in the opinion of the Engineer is of doubtful quality shall not be used in the Works 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.

Table 2.3.2 Minimum strength of cement

Days	Compressive strength (N/mm ²)	Tensile strength (N/mm ²)
3	13	1.00
7	20	2.00
28	28	2.50

- iv) The initial setting time shall be not less than 45 minutes and the final setting time shall be not more than 8 hours. The cement when tested for fineness shall have a specific surface of not less than 160 m²/kg. The cement when tested for soundness shall not have an expansion of more than 10 mm. The unit weight of cement shall be 14.16 KN/m³.
- v) Cement shall be delivered to the work site in sound and properly sealed jute/paper bags, each plainly marked with manufacture's name or registered mark. The cement shall be protected from the weather by tarpaulins or other approved covering during transit. The weight of individual bag containing cement shall be 50 kg and weight of all bags shall be uniform. The weight of cement shall be legibly marked on each bag. Bags in broken or damaged condition shall be rejected.
- vi) Each consignment of cement delivered to the site must be accompanied by a certificate showing the place of manufacture and the results of standard tests carried out on the bulk supply from which the cement was extracted.
- vii) The Contractor shall provide waterproof and well ventilated pucca godowns at the specified or approved location at the site, having a floor of wood or concrete raised at least 450 mm above

	the ground. The sheds shall be large enough to allow a minimum 300mm gap between the stacked cement and the godown walls, to store sufficient cement stored to ensure continuity of work and to permit each consignment to be stacked separately therein to permit easy access for inspection. All storage facilities shall be subject to approval by the Engineer. viii) Immediately upon arrival at the site, cement shall be stored in the godowns with adequate provision to prevent absorption of moisture. The Contractor shall use the consignments in the order in which they are received. Cement delivered to the site in drums or bags provided by the supplier or manufacturer shall be stored in the drums or bags until used in the Works. Any cement in drums or bags which have been opened shall be used immediately after opening. The cement shall not be stored in a godown for more than three months or a lesser period as directed by the Engineer. After this period has expired, any unused cement shall be removed from the site. ix) The cement shall be placed in the sheds immediately upon delivery to the site and shall be used in the order in which it has been delivered. Any cement in bags which have been opened shall be used immediately after opening.						
	2.5.3 Coarse Aggregate i) The coarse aggregates shall be crushed stone chips (40 mm downgraded or as specified in the design) and well shaped. The amount of clay, fine silt and fine dust occurring in a free state or as a loose adherent shall not exceed one percent by weight. Crushed stone chips aggregates shall comply with B.S 882 - Part 2 and shall 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. The various sizes of particles of which an aggregate is composed shall be uniformly distributed throughout the mass. The aggregates shall be stored on hard and dry ground with adequate partitions to ensure the separation of different types and grading. Care shall be taken in storage to avoid inclusion of any foreign material in the aggregates. The aggregates shall be handled carefully so as to avoid segregation of various sizes within each grade. Testing of aggregates shall be in accordance with B.S 812. The Engineer reserves the right to approve or reject the sources of aggregates. No materials shall be used in the work until it has been tested and test result sheets showing that it complies with the relevant standard, have been delivered to the Engineer. ii) Coarse aggregates shall be well graded within the grading given in the table below: Percentage by Weight Passing Standard Sieves Table 2.3.3 Grading of coarse aggregate 40 mm maximum size <table border="1"> <tr> <th>US Standard Square Mesh</th><th>40 mm</th></tr> <tr> <td>50.80 mm</td><td>100</td></tr> <tr> <td>38.10 mm</td><td>95 – 100</td></tr> </table>	US Standard Square Mesh	40 mm	50.80 mm	100	38.10 mm	95 – 100
US Standard Square Mesh	40 mm						
50.80 mm	100						
38.10 mm	95 – 100						

	<table><tr><td>25.40 mm</td><td>-</td></tr><tr><td>19.05 mm</td><td>35 – 70</td></tr><tr><td>12.70 mm</td><td>-</td></tr><tr><td>9.52 mm</td><td>10 – 30</td></tr><tr><td>No. 4</td><td>0 – 5</td></tr><tr><td>No. 8</td><td>-</td></tr></table> Stone Chips shall satisfy the following criteria: Water absorption as determined by STP 7.5 (or AASHTO T-85) or BS-812 shall not be more than 2 %. The Aggregate Impact Value (AIV) shall not exceed 30% limit as per BS 812: Part 3, Chapter 6. The percentage of wear according to Los Angeles Test shall not be more than 35 as per ASTM C535.	25.40 mm	-	19.05 mm	35 – 70	12.70 mm	-	9.52 mm	10 – 30	No. 4	0 – 5	No. 8	-						
25.40 mm	-																		
19.05 mm	35 – 70																		
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9.52 mm	10 – 30																		
No. 4	0 – 5																		
No. 8	-																		
	2.5.4 Fine Aggregates Fine aggregates shall be non-saline and consist of hard, dense, durable materials and shall be free from injurious amounts of clay lumps, light weight materials or other deleterious substances. No materials shall be used in the work until it has been tested and test result sheets showing that it complies with the relevant standard, have been delivered to the Engineer. Fine aggregates shall have a fineness modulus (FM) equal to or greater than 1.5 and shall conform to the following requirements: Table 2.3.4 Grading of fine aggregate <table><tr><th>Sieve No.</th><th>Sieve Size (mm)</th><th>Percentage by weight passing</th></tr><tr><td>4</td><td>4.76</td><td>95-100</td></tr><tr><td>16</td><td>1.18</td><td>45-80</td></tr><tr><td>50</td><td>0.30</td><td>10-30</td></tr><tr><td>100</td><td>0.15</td><td>2 – 10</td></tr><tr><td>Pan</td><td>-</td><td>3 – 7</td></tr></table>	Sieve No.	Sieve Size (mm)	Percentage by weight passing	4	4.76	95-100	16	1.18	45-80	50	0.30	10-30	100	0.15	2 – 10	Pan	-	3 – 7
Sieve No.	Sieve Size (mm)	Percentage by weight passing																	
4	4.76	95-100																	
16	1.18	45-80																	
50	0.30	10-30																	
100	0.15	2 – 10																	
Pan	-	3 – 7																	
	2.5.4 Water The water used for concrete mixing and curing shall be drinkable water, clean and free from any substances injurious to the finished product. It shall 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 shall take samples of the water being used or which is proposed to be used for mixing concrete and test them in accordance with BS 3148. No concrete shall be made with unapproved water.																		
	2.5.5 Formwork Formwork and moulds shall be constructed to ensure designed uniform shapes and block sizes. They shall be of steel sheet of minimum 18 gauges with arrangement of nuts and bolts or other mechanism so that they can be easily removed in two parts without any impairment to the cast C.C. Block. Wherever any defect is noticed in a formwork should immediately be replaced as per direction of Engineer or Engineer's Representative. 2.5.6 Concrete Type Concrete shall be of compressive strengths as shown on the Drawings or as directed by the Engineer. Each mix shall be																		

	designed to ensure optimum workability, prevent segregation and produce a dense, durable concrete by adjusting the fine and coarse aggregate proportions following the procedures set out in the specification. The Blocks will be used in River Bank Protection Work shall have minimum 28 days Cylinder Strength of 9.0 N/mm²
	2.5.7 Mix Design The Contractor shall prepare trial mixes having workability, strength and surface finish as criteria, to satisfy the Engineer regarding these qualities. The trial mixes shall be made and compacted in the presence of the Engineer, using the same type of equipment as will be used for the Works. Not later than 7 days before commencement of concreting operations, the Contractor shall inform the Engineer in writing about mix designs he proposes to use, and his target slumps for the various Items. These trials shall not cease until the Contractor has demonstrated that the requirements of these Technical Specifications have been met. The margin of the trial mix should be taken as 1.5 times of the characteristics strength of the concrete. Twelve concrete cylinder samples shall be made from the trial mix in the presence of the Engineer. The concrete cylinders shall be made, cured, stored and tested in accordance with BS 1881. Six cylinders shall be tested at 7 days and six cylinders shall be tested at 28 days. If the strength of any of the cylinders tested at 28 days is below the characteristic strength, the Contractor shall redesign the mix, make further preliminary mixes for the Engineer's approval, then undertake additional trial mixes and test the resultant samples until a satisfactory mix is obtained and approved by the Engineer. The trial mix proportions should be approved if the required strength is obtained from tests carried out and the consistency and surface is to the satisfaction of the Engineer. When a mix has been approved, no variations shall be made in the mix proportions, or in the type, size, grading zone or source, of any of the constituents without the consent of the Engineer, who may require further trial mixes to be made before any such variations are approved.
	2.5.8 Mixing All concrete shall be mixed in modern mechanically operated mixers(Concrete Batch Plant) capable of combining aggregate, cement and water into a uniform mixture and discharging without segregation. The mixer machine without hopper shall not be allowed for mixing and wooden box shall have to use to discharge coarse and fine aggregate into the hopper. Unless otherwise permitted by the Engineer, hand mixing of concrete is prohibited. Mixing should be done thoroughly to ensure that concrete of uniform color and consistency is obtained. Mixing time shall be at least one minute after the last ingredient has been added to the mixer or so much more time as may be recommended by the Engineer. Specified vibrator shall be used in casting of the blocks. The forms of CC blocks shall not be opened before 24 hours or as directed by the Engineer. Honey combed or damaged blocks shall not be acceptable
	2.5.9 Water Cement Ratio The maximum water cement ratios specified shall be the ratios by weight of free water to cement in the mix based on the aggregates

	being in a saturated surface dry condition. The Contractor shall test aggregates for moisture content and so determine the water/cement ratio of the fresh concrete. Water cement ratio shall not exceed 0.45, unless otherwise indicated in the Drawings or approved by the Engineer. Throughout concrete production the actual water cement ratio shall be strictly monitored and the batch quantities of aggregates and water regularly adjusted to maintain the design water cement ratio. Determinations of water/cement ratio shall be carried out as required by the Engineer and the calculations submitted to him
	2.5.10 Slump The Contractor shall make available required number slump cone at site. The Contractor shall undertake slump tests of the freshly made concrete in accordance with BS 1881 and the slump shall be within the range of 50 to 100 mm unless otherwise indicated in the drawings or approved by the Engineer. If the range does not comply with the mix, it should not be used. Slump tests shall be carried out on each batch of concrete of 25m³ or as directed by the Engineer. The records of slump tests result shall be maintained in a register and be made available to inspection
	2.5.11 Concrete Test Cylinder The sampling of concrete for preparing Concrete Test Cylinders shall, where possible, be undertaken at the place of concrete mix. Each sampling shall provide sufficient concrete to make 6 (six) cylinders and allow a slump test. Samples shall be taken for each 50 m³ for blocks of concrete batched or at a frequency agreed by the Engineer. The cylinders shall be cured properly and sent to a field laboratory/recognized laboratory through the representative of the Engineer. All cost of such tests shall be borne by the Contractor. After stripping, each cylinder shall be indelibly marked with the date taken and engraving signature of the Engineer or his representative, and the prescribed number be sent regularly for test to a testing laboratory acceptable to the Engineer. If the specified values are not obtained from cylinder tests on any concrete mix, no further concrete of that mix shall be used in the Works and the Contractor shall establish the cause of the failure and undertake such remedies as are necessary. The Contractor shall demonstrate by trial mixes and the results of cylinder tests that the revised mix is in accordance with the specification. The above mentioned activities be recorded in a register and be made available as and when asked for.
	2.5.12 Non-destructive Test The Contractor shall provide on site a 'rebound' (Schmidt or similar) hammer duly calibrated from reputed designated laboratory for checking the in-situ strength of the concrete for use by the Engineer. Testing shall be carried out frequently or at the frequency and in the locations directed by the Engineer. The field test may be taken by rebound hammer on blocks; the strength should be >9.0 N/mm² at 28 days. Any concrete blocks found to be of strength less than specified will be removed from the Works site and have to be replaced by the Contractor.
	2.5.13 Casting of C.C Block CC Blocks Casting/Concreting yards should be leveled well compacted ground with neat sand-cement mortar finished brick soling/lean concrete finish over it. Casting Moulds/Forms are to be placed over thick polythene sheeting to prevent leakage through bottom face of the shutter. Inner sides of the Moulds/Forms are to

	be cleaned and oiled before each batch of casting operation. Mixing of concrete shall be done by machine mixing. Unless otherwise permitted by the Engineer, hand mixing of concrete is prohibited. Mixing should be done thoroughly to ensure that concrete is of uniform color and consistency.. The concrete shall be placed in the Moulds/Forms in full and be thoroughly compacted by vibrators supplemented by hand spading and tamping. In no way the vibrator should touch the Mould/Form during vibration operation. The vibrators shall at all times be adequate in numbers to compact the concrete properly and quickly throughout the whole operation of Block casting in each batch. The duration of vibration shall be limited to that required to produce satisfactory compaction without causing segregation. Care should be taken that no leakage of cement mortar takes place. After compaction the exposed concrete at top surface shall be struck off smooth with hand held steel floats. The Moulds/Forms shall not be opened until the concrete is firmly set. Honey combed or partly damaged blocks shall not be acceptable The contractor shall arrange all land required for the CC Blocks Casting/Concreting yards, preparation of yard with brick soling, polythene sheeting, oiling of Moulds / Forms etc for which no extra cost will be paid. All compensations in this regards are deemed to have covered by the BoQ item "Cement Concrete Blocks (CC Blocks)"
	2.5.14 Curing of Concrete Blocks Concrete Blocks shall be protected from the effects of sunshine, dry wind, rain, running water or mechanical damage for a continuous period, until the concrete has reached at least three quarters of its 28 day strength, but for not less than 10 days. The Contractor shall submit his proposals to achieve this protection for Engineer's approval. The water used for concrete curing shall be fresh water, clean and free from any substances injurious to the concrete. The use of saline water for curing purposes will not be permitted. Curing and protection of concrete may be done following the methods: (i) By water spray in continuous operation or a layer of water; (ii) By covering with Hessian or similar absorbent material, or sand, kept continuously wet; (iii) After thorough wetting, by covering with a layer of water proof fabric kept in contact with concrete surface; (iv) All materials spray equipment and an ample supply of water for curing shall be ready on site before manufacturing of Precast C.C Block starts. C.C Blocks that is, in the opinion of the Engineer, not cured according to the approved curing procedure will be regarded as inferior and shall be dealt with as damaged blocks.

	2.5.15 Numbering of Blocks Each block shall be marked with a consecutive number and the date of casting. The Contractor shall maintain a manufacturing register with signature of Engineer or his representative. The number, date of casting, date and location of placing of each block shall be recorded in the register and shall make the register available at all times for inspection by the Engineer.
	2.5.16 Stockpiles of Block Blocks shall not be stockpiled until they have been cured for at least 21 days. They should be stockpiled with consecutive numbers and in measurable stack. The stacks shall not contain more than 4 layers and shall not be stacks very closed to the riverbank.
	2.5.17 Damaged Blocks and Rejected Blocks Blocks which are found unspecified through visual inspection by the Engineer or his representative shall be rejected. If laboratory test result are found not conforming to the desired strengths, all the Blocks manufactured on the day representing the date of sample collection shall be rejected (all the Blocks manufactured on the date representing the Test). All those Blocks shall be stacked separately. Blocks which are damaged during stockpiling, transport or handling and shall be rejected and stacked separately. The Contractor shall remove those rejected and damaged Blocks from the site within 24 hours ordered by the Engineer. The contractor has to supplement the damaged or rejected number of blocks at his/their at his/their own cost.
	2.5.18 Measurement Measurement of concrete blocks shall be made on Blocks in numbers (size-wise) casted, cured and stockpiled.
	2.5.19 Payment Payment shall be made in number at the unit rate of block (size-wise) against the Items for two types of CC Blocks as included in the Bill of quantities.
2.6 Supply of Hard Rocks	2.6.1 General Hard Rock shall be used in development of the Launching Apron of the Cross Bar. Hard rock shall conform to the sizes/weights and grading shown on the Drawings. The material shall not be polluted, and shall be free from objectionable quantities of dirt, sand, dust and elongated or flaky stones. The ratio between the smallest and largest dimension of single stone shall generally be not less than 0.4. The hard rock can be procured from any sources inside or outside Bangladesh which conform to the specifications. But the Contractor must take approval of Project Director/ Deputy Project Director of the quarry of Hard Rock from where he planed to procure the material. For this purposes , he shall arrange visit for 3(three) authorized Representative of the Project Director to the Quarry Site including stay as will be required for investigation and testing. The expenditure thus incurred shall be borne by the Contractor

	The hard rock shall be free from cracks and veins, which could lead to breakage during loading, unloading and dumping. The bulk specific gravity of hard rock shall have a minimum value of 2700 kg/m³ as per BS 812; part 2, chapter 6. The weighted average loss of materials in the sodium sulphate soundness test shall not be more than 10% by weight in accordance with ASTM C88. The percentage of wear as determined by the Los Angeles Test shall not be more than 40 as per ASTM C535. The Aggregate Impact Value on average shall not exceed the 30% limit included in BS 812; Part 3, Chapter 6. 2.6.2 Size and Void The following size of rock shall be used in development of launching apron of river bank revetment work shall be considered to have void as shown below; Rock size: 30 cm to 45 cm. (Void = 20 %) Rock size: 45 cm and above (Void = 20%)
	2.6.3 Procurement Schedule The Contractor shall have to furnish the Procurement Schedule mentioning quantity of materials to be procured in each consignment with definite period. The contractual quantity of hard rock shall have to be procured by maximum three consignments. No measurement shall be taken unless one third materials is procured and stockpiled at site 2.6.4 Measurement Measurement of Hard Rock shall be made on Cubic Meter procured and stockpiled at site. The respective percentage of void shall be deducted from the measured volume for payment. The stack-wise measurement shall be recorded in a register duly signed by the Engineer. The measured stack shall be fully coloured using power spray and permanent colour for clear distinguishing between measured and unmeasured stack of Hard Rock at site. 2.6.5 Payment Payment shall be made at the unit rate per Cubic Meter as included in the Bill of quantities.
2.7 Supplying and Laying of Sand Filter	2.7.1 General The fine filter shall consist of natural sand of FM 1.0 to 1.5 or as specified in the drawing. The material shall not contain any flint, chip or lime. The quantity of silt, clay and dust, determined in accordance with the decantation method given in BS 812, shall not exceed 3% by weight of the sample. The content of mica shall not exceed 3% by weight of the sample. The material shall not contain any deleterious material in such form or in sufficient quantity as to affect adversely on the geo-textile filter above. 2.7.2 Construction The foundation for the sand filter shall be thoroughly compacted and

	graded to the elevations shown on the Drawings prior to the placement. The filter material shall be placed in a uniform layer of the thickness shown on the drawing or directed by the Engineer. Minimum 100 mm thickness sand or as specified in the drawing having FM 1.0 to 1.5 shall be placed on prepared, well dressed and compacted slope above LWL Following steps to be followed in laying sand filter: The Contractor shall prepare the foundation for sand filter; The Contractor shall use sand which has been previously approved by the Engineer through test at field laboratory ; Before placing the sand filter, it should be ensured through joint inspection that the slope of revetment/foundation has duly been developed(leveled/compacted) as per design; The Contractor shall place the sand filter to the lines, grades and thickness shown on the drawings following the approval of the Engineer; The Contractor shall notify the Engineer when each section of the sand filter placement is completed
	2.7.3 Measurement Measurement of item sand filter shall be made in cubic meter derived by multiplying area covered by the sand filter with the thickness
	2.7.4 Payment Payment of item Sand Filter shall be made at the unit rate per Cubic Meter against the item as included in the Bill of Quantities
2.8 Supplying and laying of Geo-textile Filter	2.8.1 Geo-textile Fabrics All geo-textile fabric shall meet in full the requirements of Physical, Mechanical and Hydraulic properties. The geo-textile manufacturer must be ISO 9000 certified by an accredited register. Geo-textile in standard rolls shall be clearly marked at regular intervals (every square meter or continuous marking at 1 m distance) with the product name and grade. Marking in every 100 sqm. is required to identify the supplier. Each roll of geo-textile shall be protected in a plastic foil wrapper, clearly labeled with the roll number, production of lot number and description of the product, product name, grade and manufacturers details. Geo-textile filter shall be extended up to 1000 mm below LWL. Geo-textile filter shall be protected from ultra violet ray and any sort of damage during handling and placing. The geo-textiles shall be manufactured from polypropylene or polyester fabric and shall be non-woven needle-punched and not solely thermally bonded. The thermal bond shall not influence the flexibility under water. The required porosity of geo-textile shall be minimum 80%. Porosity is a calculated value out of tested material characteristics and the specific weight of the fibers

2.8.2 Specification

The geo-textiles shall be manufactured from polypropylene or polyester fabric and shall be non-woven and needle punched and not solely thermally bonded. The thermal bond shall not influence the flexibility of the sand bags including their launching behavior. The Geo-textile shall comply the following properties:

Sl	Test Parameter	Standard Value
1	Mass per unit area	$\geq 400 \text{ gm/ m}^2$
2	Thickness under a pressure of 2 kPa	$\geq 3 \text{ mm}$
3	Apparent / Effective Opening size	$\geq 0.08 \text{ mm}$
4	Horizontal Permeability	$\geq 3 \times 10E^{-3} \text{ m/sec}$
5	Vertical Permeability	$\geq 5 \times 10E^{-3} \text{ m/sec}$
6	Grab Tensile Strength	$\geq 1500 \text{ N}$
7	Strip Tensile Strength	$\geq 25 \text{ KN / m}$
8	CBR Puncture Resistance	$\geq 3800 \text{ N}$
9	Elongation at maximum force (machine direction MD)	$\geq 60\%$ and $\leq 100\%$
10	Elongation at maximum force (CMD)	$\geq 40\%$ and $\leq 100\%$
11	Permeability (Velocity Index for a head loss of 50 mm- V _{H50})	$\geq 2 \times 10^{-3} \text{ m/sec}$
12	Ultra-Violet (UV) Resistance	$\geq 70\%$ of original tensile strength before exposure

2.8.3 Testing of Geo-textile Fabric

- i) Geo-textile delivered at site should be certified by ISO with brand name.
- ii) The properties of geo-textile to be delivered at site shall be tested at BRTC, BUET according to relevant test standard given in the specification.
- iii) Tests shall be carried out from each quantity of 10,000 square meter of geo-textile fabric supplied. Seams shall be tested for tensile strength every 10,000 m of seam.
- iv) The sample size for the fabric shall be 2 m² and shall be marked to indicate its upper side, longitudinal and transverse directions, type of geo-textile and the date that the sample was taken. Seam samples shall be at least one meter in length and the ends of the threads are to be firmly tied off by the Contractor or Supplier at the time the samples are taken. Each test shall be carried out on at least three samples.
- v) The Contractor shall bear the expenses of all routine tests. Notwithstanding the submission of reports to the effect that the geo-textile conforms to the Specification, the Engineer shall at all times be entitled to have additional samples of geo-textile tested if he is of the opinion that the geo-textile does not conform to the Specification. The Engineer shall only select samples from any lot of bags procured at site by the contractor.

2.8.4 Construction

The Geo-textile fabrics shall be placed above the inverted filter on the surface of slope of embankment / river bank as per design and drawing. The fabric shall be placed in position, providing machine seamed joints (with 100% polypropylene or nylon thread) or minimum

	35 cm lap in dry condition and minimum 100 cm lap under water including protecting the geo-textile materials from UV sun ray and from any other damages 2.8.5 Measurement Measurement of item geo-textile filter shall be made based on the area in square meters measured parallel to the face on the slopes as shown on the drawings or as directed by the Engineer. No additional payment will be made for fabric used to provide specified laps.
	2.8.6 Payment Payment of item of Geo-textile Filter Fabric shall be at the unit rate per Square Meter as included in the Bill of Quantities
2.9 Supplying & Laying 1st Class/Pick Jhama Chips as Filter	2.9.1 General Coarse (aggregate) filter materials shall be made from first class /picked jhama bricks. The bricks shall be sound, hard and well burnt, uniform color, homogeneous in texture and free from flaws & cracks. A fractured surface shall show a uniform compact structure, free from holes, lumps or grits. The unit weight shall not be less than 1100 kg/m³; minimum crushing strength 14 N/m² and above; increase in weight after one hour absorption in water shall not more than 15% of dry weight. Any dust or fine materials below 5mm size are to be removed by screening and be thoroughly washed by an approved method. 2.9.2 Construction The aggregate filter materials shall be laid on two layers of equal thickness or as shown in the drawings. The filter material of thickness 100 mm (40mm to 20 mm well graded at top & 20mm to 5mm at bottom) shall laid in accordance with the grading shown on the drawings Following steps are to be followed in laying khoa filter: The Contractor shall use the khoa filter which has been previously approved by the Engineer for use as filter through test at field laboratory; Before placing the khoa filter it should be ensured through joint inspection (Executive Engineer or his/her Representative and the Contractor or his Representative) that the geo-textile fabrics have been placed as per design; The Contractor shall place the filter to the lines, grades and thickness shown on the drawings following the approval of the Engineer; Placing of the khoa filter shall be done so carefully that the geo-textile fabrics is not impaired or perforated. If it happen so, the contractor shall replace that segment with new one at his own cost; The Engineer shall inspect the work to check compliance with the specified requirements. Samples shall be taken jointly by the Engineer's Representative and Contractor's Representative for laboratory testing;

	The Contractor shall notify the Engineer when each section of the khoa filter placement is complete																																							
	2.9.3 Measurement Measurement of item sand filter shall be made in cubic meter derived by multiplying area covered by the khoa filter with the thickness for the 2 (two) types (40 mm to 20mm & 20 mm to 5 mm) separately as provided in the BOQ.																																							
	2.9.4 Payment Payment of item Khoa Filter shall be made at the unit rate per Cubic Meter against the items for the two types separately as included in the Bill of Quantities																																							
2.10 Supplying & Dumping of Geo-textile Bags by Floating Barge	2.10.1 General The aim is to provide a continuous geo-bag revetment / mattress in under water river bank slope including at least 15m falling apron so that no scour could be occurred.																																							
	2.10.2 Geo-textile Specification The geo-textiles shall be manufactured from polypropylene or polyester fabric and shall be non-woven and needle punched and not solely thermally bonded. The thermal bond shall not influence the flexibility of the sand bags including their launching behavior. The Geo-textile shall comply the following properties: <table><tr><th>Sl</th><th>Test Parameter</th><th>Standard Value</th></tr><tr><td>1</td><td>Mass per unit area</td><td>=>400 gm/ m²</td></tr><tr><td>2</td><td>Thickness under a pressure of 2 kPa</td><td>=>3 mm</td></tr><tr><td>3</td><td>Apparent / Effective Opening size</td><td>=>0.08 mm</td></tr><tr><td>4</td><td>Horizontal Permeability</td><td>=> 3 x 10E⁻³ m/sec</td></tr><tr><td>5</td><td>Vertical Permeability</td><td>=> 4.5 x 10E⁻³ m/sec</td></tr><tr><td>6</td><td>Grab Tensile Strength</td><td>=>1500 N</td></tr><tr><td>7</td><td>Strip Tensile Strength</td><td>=>23 KN / m</td></tr><tr><td>8</td><td>CBR Puncture Resistance</td><td>=> 3800 N</td></tr><tr><td>9</td><td>Elongation at maximum force (machine direction MD)</td><td>=>60% and <=100%</td></tr><tr><td>10</td><td>Elongation at maximum force (CMD)</td><td>=>40% and <=100%</td></tr><tr><td>11</td><td>Permeability (Velocity Index for a head loss of 50 mm- V_{H50})</td><td>=> 2 x 10⁻³ m/sec</td></tr><tr><td>12</td><td>UV resistance</td><td>=>70% of original tensile strength before exposure</td></tr></table>	Sl	Test Parameter	Standard Value	1	Mass per unit area	=>400 gm/ m ²	2	Thickness under a pressure of 2 kPa	=>3 mm	3	Apparent / Effective Opening size	=>0.08 mm	4	Horizontal Permeability	=> 3 x 10E ⁻³ m/sec	5	Vertical Permeability	=> 4.5 x 10E ⁻³ m/sec	6	Grab Tensile Strength	=>1500 N	7	Strip Tensile Strength	=>23 KN / m	8	CBR Puncture Resistance	=> 3800 N	9	Elongation at maximum force (machine direction MD)	=>60% and <=100%	10	Elongation at maximum force (CMD)	=>40% and <=100%	11	Permeability (Velocity Index for a head loss of 50 mm- V _{H50})	=> 2 x 10 ⁻³ m/sec	12	UV resistance	=>70% of original tensile strength before exposure
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	2.10.3 Testing of Geo-textile Fabrics Geo-textile delivered at site should be certified by ISO with brand name. i) The properties of geo-textile to be delivered at site shall be tested at BRTC, BUET according to relevant test standard given in the specification. ii) Tests shall be carried out from each quantity of 10,000 nos. of geo-textile bag supplied. Seams shall be tested for tensile																																							

	strength every 10,000 m of seam. iii) The sample size for the fabric shall be 2 m² and shall be marked to indicate its upper side, longitudinal and transverse directions, type of geo-textile and the date that the sample was taken. Seam samples shall be at least one meter in length and the ends of the threads are to be firmly tied off by the Contractor or Supplier at the time the samples are taken. Each test shall be carried out on at least three samples. iv) The Contractor shall bear the expenses of all routine tests. Notwithstanding the submission of reports to the effect that the geo-textile conforms to the Specification, the Engineer shall at all times be entitled to have additional samples of geo-textile tested if he is of the opinion that the geo-textile does not conform to the Specification. The Engineer shall only select samples from any lot of bags procured at site by the contractor.								
	2.10.4 Required Properties of Geo-textile Bags All geo-textiles bags shall be manufactured and supplied from a single source and grade of geo-textile and shall comply in full with the following specification; <table><tr><td>Bag size (Empty)</td><td>Weight (kg) (When filled with dry sand of FM ≥ 1.0)</td><td>Filled Volume (m³)</td><td>Min seam strength EN ISO 10321</td></tr><tr><td>1200 mm x 950mm</td><td>250</td><td>0.1667</td><td>18 N/m</td></tr></table>	Bag size (Empty)	Weight (kg) (When filled with dry sand of FM ≥ 1.0)	Filled Volume (m ³)	Min seam strength EN ISO 10321	1200 mm x 950mm	250	0.1667	18 N/m
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1200 mm x 950mm	250	0.1667	18 N/m						
	2.10.5 Preparation and Sewing of Geo-textile Bags (i) The geo-bags shall be prepared by sewing on two longitudinal sides as per drawing. The transverse (top) side shall be kept open for subsequent closing. ii) Sewing should be done by machine at machine or cross-machine direction. iii) The number of stitch in every 25 mm should not be less than 6 nos. The stitch shall be double thread chain stitch type (type 401 under ISO 4915/DIN 61400) or two thread type with lock stitch (type 301 under ISO 4915/DIN 61400). iv) At the bottom end of each seam (at the folded side) the stitch shall be locked either by stitching one time back and forth for a length of minimum 25mm from the end of the bag, or by joining the ends of the two threads e.g. by gluing, knotting or other appropriate methods, acceptable to the Engineer. v) The two lines of stitches shall be within 5 mm distance								

	with a margin of 20 mm from the edge of the geo-textile to the centerline between the two seams. The tolerance is 3 mm in each direction. vi) Thread used for stitching should be 100% polypropylene or Nylon vii) The thread used must be of high quality and equivalent stability to UV exposure as the geo-textile material
	2.10.6 Storing Geo-textile Bags The Contractor must build secured temporary storing facilities of geo-bags at site in order to protect the Geo-bag from UV ray
	2.10.7 Filling, Sewing and Stacking of Geo Bags The filling sand shall be non-saline clean natural sand and have a fineness modulus ≥ 1.00. The amount of silt, clay and fines shall not exceed 5%. The geo-textile bag shall be filled up with dry specified sand. The fill volume and weight of each bag shall not be less than what have been specified under Sub-clause 2.10.4. After filling the bag shall be checked by weighing scale and close the mouth by specified seam (04 lines) using double needle sewing machine. The stitch shall be double thread chain stitch type (type 401 under ISO 4915/DIN 61400) or two thread type with lock stitch (type 301 under ISO 4915/DIN 61400).. Number of stitch per 25 mm should be 6 Nos. Minimum margin from the edge of the Geo-textile to the stitch line should be 50 mm. Thread for stitching should be 100% polypropylene or Nylon. Geo-textile Bags after filling with specified sand and sewing shall be stacked properly in measurable stacks. The Contractor must build secured temporary storing facilities of geo-bags at site in order to protect the Geo-bag from UV ray and other damages.
	2.10.8 Dumping Plan The contractor shall have to conduct bathymetric survey, prepare dumping plan mentioning global positional coordinate based on the bathymetric survey using applicable software and submitting to the Engineer for approval prior to commencement of dumping work.
	2.10.9 Damping of Bag i) The bag dumping shall be performed using flat top barge, anchored and positioned by double drum mooring winch. Bags for use in launching apron shall be stockpiled to the satisfaction of the Engineer. Prior to the commencement of dumping, the contractor proposal to ensure that the quality & quantity have been approved by the Engineer. ii) The dumping shall be started at the far end in the river and proceeds towards the river bank. The contractor shall maintain dumping register duly signed by the quality control personnel. The quantity of bag to be

	dumped shall be recorded in the register with date and shall make the register available at site for inspection. iii) Dumping of bags below low water level must start early December or at such time while river attains its LWL and must be accomplished no later 30 April or as specified in the design. iv) The entire revetment / protective work length shall be divided into suitable panels or batches and dumping area shall be delineated by GPS coordinate using total station. Dumping shall be done in suitable batches / panel simultaneously in continuous reach with the aid of barge or floating pontoon. The material of each batch / panel shall be stored in several stacks. After full development of launching apron of each batch / panel as per design, then dumping of new batch / panel can be started. v) The dumping volume will be checked by taking Pre-work and Post-work cross sections. The dumping area shall be verified by engaging divers who identify the uncovered area through installation of buoy. The contractor shall take immediate action to cover the identified bare area through dumping geo-bags
	2.10.10 Measurement Measurement of item Dumping of Geo-textile Bag shall be made on Each Number of bag dumped
	2.10.11 Payment Payment shall be made at the unit rate per bag as included in the Bill of quantities. The unit rate includes all cost of bags, sand, sewing thread, buoy, labour, all equipment, filling, sewing, stacking, transportation and dumping bag etc. including survey.
2.11 Placing/laying of different size of Cement Concrete Blocks	2.11.1 General The CC blocks shall be placed on the on slopes of protective works to cover the surface over a geo-textile fabric filter and granular filter underneath in the profile shown on the drawing. Placing of CC Blocks shall commence from the most upstream part of the eroded bank, based on a chainage to be furnished by the Engineer. The toe foundation shall be either excavated or built up to the lines and levels shown on the drawing. The placing of blocks shall start from the toe and progress up the slope at the segment where launching apron of protective work has been fully developed as per design.
	2.11.2 Construction Procedures The blocks shall be laid in manner so that underlying filter layer and geo-filter is not displaced /damaged. Any damage caused to the geo-filter during placing of the blocks shall be repaired by the Contractor at his own cost and to the satisfaction of the Engineer. The entire outer face above LWL shall have a smooth and even appearance.

	During the placement of the blocks, the underlying filter shall not be disturbed by removing or denting a portion thereof by any manner harmful to the filter. Any damage to the filter during overlaying shall be repaired by the Contractor at his own cost. The outer surface of the completed revetment shall have a smooth appearance with minimal unevenness. The inverted filter layers and CC blocks placement shall start from the toe and progress up the slope of the embankment/dyke. The fine filter layers shall be placed and lightly tamped into place, followed by the coarse filter layer which shall be sufficiently compacted to support the overlaying material. The inverted filter shall not advance more than 1 m up the slope before being covered by the specified overlaying material to assist placement and prevent damage to the filter layer. The CC block shall be laid on the filter in rows parallel to the direction of the current. The blocks in each row shall be staggered half a block width from those in the row below. Adjacent blocks in the same row shall be laid with a gap between them of the minimum dimensions given below: <table border="1"> <tr> <th>Block Size</th><th>Gap (mm)</th></tr> <tr> <td>0.60 m and less</td><td>10</td></tr> <tr> <td>larger than 0.6 m</td><td>15</td></tr> </table> 2.11.3 Measurement Measurement of item Placing Concrete Blocks shall be made in cubic meter based on the numbers and size of Blocks used to cover the area as shown in the drawing. The initial distance of laying/placing is within 200 m. Works accomplished beyond the initial distance of 200 m shall be measured & recorded under separate Item as provided in the BoQ. 2.11.4 Payment Payment of item Placing Concrete Blocks shall be at the unit rate per Cubic Meter as included in the Bill of Quantities. Extra rate beyond the initial distance as recorded will be paid under separate Item at the Unit Price as included in the BoQ	Block Size	Gap (mm)	0.60 m and less	10	larger than 0.6 m	15
Block Size	Gap (mm)						
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2.12 Dumping of Hard Rocks/ Boulders/CC Blocks	2.12.1 General The revetment works shall commence from the most upstream part of the segment , based on a chainage to be furnished by the Engineer. The toe foundation shall be either excavated or built up to the lines and levels shown on the drawing. 2.12.2 Stockpile of Rocks/Boulder/CC Blocks Hard Rocks/Boulders/C.C Blocks for use in launching aprons shall be stockpiled in different sizes and in the percentages shown on the Drawings to the satisfaction of the Engineer. Prior to the commencement of placing / dumping the Hard Rocks/Boulders/C.C Blocks, the Contractor's proposal to ensure that the different Hard Rocks/Boulders/C.C Blocks sizes are well distributed shall have been approved by the Engineer. If required, the effectiveness of the Contractor's proposal shall be demonstrated to the Engineer.						

	2.12.3 Dumping Plan The contractor shall have to prepare a Dumping Plan, conduct bathymetric survey, mentioning global positional coordinate based on the bathymetric survey using applicable software and submit to the Engineer for approval prior to commencement of dumping work. The dumping plan shall be prepared following the length of dumping pontoon. Each dumping plan consists of at least one fourth of the contractual revetment length. Once dumping started in a segment, it must be completed prior to start dumping in another segment.
	2.12.4 Dumping of Hard Rocks/Boulders/C.C Blocks The rock/boulders/CC Blocks dumping shall be performed using flat top barge, anchored and positioned by double drum mooring winch. Rock/Boulder/C.C Blocks for use in launching apron shall be stockpiled to the satisfaction of the Engineer. Prior to the commencement of dumping, the contractor proposal to ensure the quality & quantity shall have to be approved by the Engineer. Dumping of rocks/boulders/CC Blocks below low water level must start early December or at such time while river attains its LWL and must be accomplished no later 30 April or as specified in the design. The entire revetment / protective work length shall be divided into suitable panels or batches and dumping area shall be delineated by GPS coordinate using total station. Dumping shall be done in suitable batches / panel simultaneously in continuous reach with the aid of barge or floating pontoon. The material of each batch / panel shall be stored in several stacks. After full development of launching apron of each batch / panel as per design, then dumping of new batch / panel can be started.
	2.12.5 Dumping Records The contractor shall maintain dumping register duly signed by the Engineer or his representative. The quantity of rocks/boulder/CC Block to be dumped shall be recorded in a certified register with date and shall make it available at site for inspection. The dumping volume will be checked by taking Pre-work and Post-work cross sections. The dumping area shall be verified by engaging divers who identify the uncovered area through installation of buoy. The contractor shall take immediate action to cover the identified bare area through dumping Hard Rocks/Boulders/C.C Blocks.
	2.12.6 Measurement Measurement of Dumping of Hard Rocks/Boulders/C.C Blocks shall be the same quantity (stack-wise) in cubic Meter as measured, coloured, recorded in the certified register. A cross checking will be made between the quantity actually supplied/manufactured and the quantity dumped taking accounts of the existing quantity (if any). The initial distance of dumping is considered to be within 200 m. Works accomplished beyond the initial distance of 200 m shall be measured & recorded under separate Item as provided in the BoQ.

	2.12.7 Payment Payment shall be made at the unit rate per cubic meter as included in the Bill of quantities. Extra rate beyond the initial distance of 200 m as recorded will be paid under separate Item at the Unit Price as included in the BoQ
2.13 Earthwork in box cutting	2.13.1 General Earthwork in box cutting shall mean removal of any type of soil /materials from road/embankment so that the road can be constructed to the lines, grades, camber and dimensions shown on the Drawings. It consists of excavation of earth by manual labour or any other means and removal & disposal of the excavated earth by hauling to any distance at approved locations as per direction of the Engineer. The Contractor shall construct and maintain accurate bench marks so that levels can be easily checked by the Engineer.
	2.13.2 Spoil Management Spoil earth shall be dumped at either edges of the embankment uniformly. The dumped earth shall have to be leveled and dressed so that it takes a regular shape and top level shall either coincide with the top level of the embankment/road or be kept lower. Where possible, the spoil earths are to be put on the nearby road running along the embankment/road with proper dressing and leveling.
	2.13.3 Over Excavation Over excavation performed by the Contractor for any purpose or reasons, shall be at the expense of the Contractor. If the excavation of box cutting exceeds the depths specified, back filling shall be undertaken as fill works at the expense of the Contractor. Back filling is to be undertaken by sand having a fineness modulus (FM) between 1.0 and 1.50 or as directed by the Engineer and to be compacted to attain 90% maximum dry density at optimum moisture content with reference to laboratory density test AASHTO modified hammer.
	2.13.4 Measurement The quantity of box cutting shall be measured in Cubic Meter for payment shall include excavation of earth from road/embankment. The measured volume shall be the plan bounded by the bottom plane of the box cutting as per approved drawing the existing ground and on top by the surface of the existing ground and on the side by vertical planes of the box.
	2.13.5 Payment The work measured shall be paid as per unit prices per Cubic Meter as shown in the Bill of Quantities.
2.14 Brick on end edging with 1st Class Bricks	2.14.1 General Brick on end edging shall be provided along two sides of the road to providing support to hold on the macadam & bituminous carpeting within the fixed alignment and protect the edges from being damaged by vehicular movement.
	2.14.2 Material i) 1st Class Brick ii) Sand FM $\geq$ 0.5 Brick : The bricks shall be sound, hard and well burnt, uniform in size(250mm×125mm×75mm), shape and color, homogeneous in texture and free from flaws & cracks. A fractured surface shall show a uniform compact structure, free from holes, lumps or grits. The unit weight shall

	not be less than 1100 kg/m³; minimum crushing strength 14 N/m² and above; increase in weight after one hour absorption in water shall not more than 15% of dry weight. Sand : The material shall not contain any flint, chimp or lime. The quantity of silt, clay and dust, determined in accordance with the decantation method given in BS 812, shall not exceed 3% by weight of the sample. The content of mica shall not exceed 3% by weight of the sample. The material shall not contain any deleterious material The materials shall be stockpiled outside the working areas. Materials shall be tested and approved by the Engineer
	2.14.3 Construction Cutting of trenches along the edging alignment at required depth to true line and grade to be done. The sand of FM ≥ 0.5 has to be spread along the trenches for a thickness of minimum 40 mm and rammed & leveled properly. 1st Class Bricks of Standard Size and Shape shall be placed on end having a thickness of 125 mm (across the road surface) and struck at its top with wooden rammer so as to take its position firmly without any further settlement. The bricks are to be placed closely so that no gap between two adjacent bricks does exist. The top level of the edging shall conform to the design level. Backside of the edging shall be filled in with the sand and rammed properly.
	2.14.4 Measurement The quantity of end edging shall be measured in running metre of the work accomplished for payment shall include cutting of trenches, sand blinding, ramming etc including all materials.
	2.14.5 Payment The work measured shall be paid as per unit prices per metre as shown in the Bill of Quantities
2.15 Construction of improved Road Sub-grade	2.15.1 General The improved Road Sub-grade comprising sand, silty sand or other low plasticity materials laid on the existing earthen embankment/ Cross Bar compacted to the desired degree of compaction is to be constructed for achieving a firm base over which a good quality of pavement shall be constructed.
	2.15.2 Material i) Sand /Silty sand / other low plasticity materials Material shall not contain any flint, chimp or lime. The quantity clay and dust, determined in accordance with the decantation method given in BS 812, shall not exceed 3% by weight of the sample. The material shall not contain any deleterious material All fill materials shall be stockpiled outside the working areas. Materials shall be tested and approved by the Engineer before being used in preparation Sub-grade

	2.15.3 Construction The surface of embankment / cross bar should be prepared by scarifying, watering / drying if necessary and compacted. Sand/Silty Sand or other approved soil shall be spread in layers not exceeding 150 mm in loose thickness over the areas. Each layer shall be uniform in density, quality of material and moisture content as per requirements. Before compaction, each layer shall be moistened or aerated to provide suitable conditions for compaction. Before deployment of Equipment (Preferably Vibratory Compactor) , the Contractor shall take approval of the Engineer in respect to type of equipment to be to carry out compaction activities Compaction of each layer shall be done by mechanical means as per directions of Engineer-In-Charge. Each layer shall be uniformly compacted to attain minimum CBR 8% at suitable water content. If the material fails to achieve the required density, the layer shall be reworked with necessary alteration in compaction, so that the required compaction is obtained. A minimum of one test as per 500 M² areas for each layer shall be conducted.
	2.15.4 Measurement The quantity of construction of Improved Sub-grade shall be measured in Cubic Meter for payment shall include compaction by appropriate equipment including cost of materials and all other costs. The measured volume shall be the plane bounded by the top of the box cutting at bottom and on top by the finished Improved sub-grade and on the side by vertical planes of the Sub-grade as per design.
	2.15.5 Payment The work measured shall be paid as per unit prices per Cum as shown in the Bill of Quantities
2.16 Construction of road sub-base with Brick Chips	2.16.1 General The sub-base layer is often the main load-bearing layer of a pavement. It is designed to evenly spread the load of the paving, and any traffic thereon, to the sub-grade below. A well-constructed sub-base will aid drainage and prevent settlement. The sub-base is intended to prevent channelization and settlement. This road Sub-base constructed under this Clause shall be constructed with well graded crushed well burnt picked Jhama or first Class brick chips mixed uniformly with sand in proportion of 2:1 (Brick chip: Sand).
	2.16.2 Materials i) 50 mm down graded chips made by crushing 1st Class Brick or Picked Jhama ii) Sand FM $\geq$ 1.0 Brick : The bricks shall be sound, hard and well burnt, and color, homogeneous in texture and free from flaws & cracks. A fractured surface shall show a uniform compact structure, free from holes, lumps or grits. The unit weight shall not be less than 1100 kg/m³; minimum crushing strength 14 N/m² and above; increase in weight after one hour absorption in water shall not more than 15% of dry weight. Sand : The material shall not contain any flint, chirp or lime. The quantity of silt, clay and dust, determined in accordance with the decantation method given in BS 812, shall not exceed 3% by weight of the sample. The content of mica shall not exceed 3% by weight of the sample. The material shall not contain any deleterious material Gradation of 50 mm down graded Brick Chips is shown below;

	<table border="1"> <thead> <tr> <th>Sieve Size (mm)</th><th>% Passing through</th></tr> </thead> <tbody> <tr> <td>50</td><td>100</td></tr> <tr> <td>38</td><td>95-100</td></tr> <tr> <td>25</td><td>-</td></tr> <tr> <td>19</td><td>70-92</td></tr> <tr> <td>12,5</td><td>-</td></tr> <tr> <td>9.5</td><td>50-70</td></tr> <tr> <td># 4</td><td>35-55</td></tr> <tr> <td># 8</td><td>-</td></tr> <tr> <td># 10</td><td>-</td></tr> <tr> <td># 30</td><td>12-25</td></tr> <tr> <td># 40</td><td>-</td></tr> <tr> <td># 200</td><td>0-8</td></tr> </tbody> </table> Physical requirement of coarse aggregates(Brick Chips) for base course shall be as below: i) Los Angles Abrasion Value-50% (Maximum) Or Aggregate Impact Value- 40% (Maximum) ii) Flakiness index value -15% (Maximum) The aggregate shall be stacked at the road sided on firm, well drained ground in regular stacks, as directed by Engineer-In-Charge. The various grades shall be stacked separately and contamination by earth and other extraneous matter shall be prevented effectively. All the materials shall be stockpiled outside the working areas. Materials shall be tested and approved by the Engineer before being used in preparation Sub-grade	Sieve Size (mm)	% Passing through	50	100	38	95-100	25	-	19	70-92	12,5	-	9.5	50-70	# 4	35-55	# 8	-	# 10	-	# 30	12-25	# 40	-	# 200	0-8
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# 8	-																										
# 10	-																										
# 30	12-25																										
# 40	-																										
# 200	0-8																										
	2.16.3 Equipment i) Rotavator ii) Motor Grader iii) Wheeled roller/Vibratory Roller iv) Truck Mounted Water Tank																										
	2.16.4 Construction Immediately prior to the laying of sub-base, the sub-grade already finished shall be prepared by removing all vegetation and other extraneous matter, lightly sprinkled with water if necessary and rolled with two passes of 8 – 10 ton smooth wheeled roller Mixing of the sub-base material Brick chips of specified gradation and Sand of FM ≥ 1.0 shall in proportion 2:1 (Chip: Sand) shall be done mechanically by the mix-in-place method. The equipment used for mix-in-place construction shall be 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. The mixed sub-base material shall then be spread on the prepared sub-																										

	grade 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 Moisture content of the loose material shall be checked in accordance with specified Standard 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 below the optimum moisture content. 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. The compaction shall be carried out by, a smooth wheeled roller of 8 to 10 Ton weight. Rolling shall commence at the lower edge and proceed towards the upper edge longitudinally for portions having unidirectional cross-fall 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 proceeding pass. During rolling, the grade and cross-fall 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 till the desired CBR-25 %(Each Test shall be carried out for surface area of 500 m²) is achieved. 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. The surface finish of construction shall conform to the requirements.
	2.16.5 Measurement The sub-base shall be measured as finished work in position in cubic metres as per design. The protection of edges of the sub-base extended over the full formation as shown in the drawing shall be considered incidental to the work of providing as sub-base and as such no extra payment shall be made for the
	2.16.6 Payment The work measured shall be paid as per unit prices per Cum as shown in the Bill of Quantities which includes all cost of materials, equipment,labour, moistening etc. and other incidental charges & compensations whatever.
2.17 Construction of Compacted Water Bound Macadam Base Course	2.17.1 General This work shall consist of clean, crushed aggregates mechanically interlocked by rolling and bonding together with screening binding material where necessary and water laid on the prepared sub-grade finished in accordance with the requirements of these Specifications and in close conformity with the lines, grades, cross-sections and thickness as per approved design and as directed by the Engineer.
	2.17.2 Material i) 40 mm to 25mm down graded chips made by crushing 1st Class Brick or Picked Jhama

ii) 25 mm to 20 mm down graded chips made by crushing 1st Class Brick or Picked Jhama

Brick : The bricks shall be sound, hard and well burnt, and color, homogeneous in texture and free from flaws & cracks. A fractured surface shall show a uniform compact structure, free from holes, lumps or grits. The unit weight shall not be less than 1100 kg/m³; minimum crushing strength 14 N/m² and above; increase in weight after one hour absorption in water shall not more than 15% of dry weight. The aggregate should be screened and washed and free from dust and other objectionable and deleterious materials.

Gradations of 2(two) Types of Aggregate are shown below;

40 -25 mm downgraded size	
US Standard (Square Mesh)	% Passing by Weight
50.8mm	100
38.10 mm	95-100
25.40 mm	-
19.05 mm	35-70
12.70 mm	-
9.52 mm	10-30
No.4	0-5

25-20 mm downgraded size	
US Standard (Square Mesh)	% Passing by Weight
38.10 mm	100
25.4 mm	95-100
12.70 mm)	25 - 60
4.76 mm	0 - 10
3.17 mm	0-5

All the materials shall be stockpiled outside the working areas. Materials shall be tested and approved by the Engineer before being used in Construction of the Water Bound Course

2.17.3 Equipment

i) Motor Grader/Aggregate Spreader

	ii) Wheeled roller/Vibratory Roller iii) Water Sprinkler
	2.17.4 Construction The surface of the sub-base to receive the water bound macadam course shall be prepared to the specified lines and cross-fall (camber) and made free of dust and other extraneous material. Any ruts of soft yielding places shall be corrected in an approved manner and rolled until firm surface is obtained if necessary by sprinkling water. Any surface irregularities, where predominant, shall be made good by providing appropriate type of profile corrective course (leveling course). The coarse aggregates for 1st Layer of size 40 mm to 25 mm down graded shall first be spread uniformly and evenly upon the prepared sub-base to proper profile by using templates placed across the road about 6 m apart, in such quantities that the thickness of each compacted layer is not more than 100 mm. Approved mechanical devices such as Aggregate Spreader shall be used to spread the aggregate uniformly so as to minimise the need for manual rectification afterwards. The spreading shall be done from stockpiles along the side of the roadway or directly from vehicles. No segregation of large or fine aggregates shall be allowed and the coarse aggregate as spread shall be of uniform gradation with no pockets of fine material. The surface of the aggregates spread shall be carefully checked with the templates and all high or low spots remedied by removing or adding aggregates as may be required. The surface shall be checked frequently with a straight edge while spreading and rolling so as to ensure a finished surface as per approved drawings. The coarse aggregates shall not normally be spread more than 3 days in advance of the subsequent construction operations.
	2.17.5 Rolling Immediately following the spreading of the coarse aggregate, rolling shall be started with three wheeled power rollers of 8 to 10 Ton capacity or tandem or vibratory rollers of 8 to 10 ton static weight. The type of roller to be used shall be approved by the Engineer based on trial run. Except on super-elevated portions where the rolling shall proceed from inner edge to the outer, rolling shall begin from the edges gradually progressing towards the centre. First the edge/edges shall be compacted with roller running forward and backward. The roller shall then move inward parallel to the centre line of the road, in successive passes uniformly lapping preceding tracks by at least one half widths. Number of passes shall not be less than 20. Rolling shall be continued till the desired CBR-80 % is achieved. After achieving the CBR- 80 % of the 1st Layer (Each Test shall be carried out for surface area of 500 m²) , spreading course aggregate for 2nd Layer of size 25mm to 20 mm down graded shall take place. Spreading and rolling shall be done in the same manner as stated above. Compaction shall be continued until the aggregates are thoroughly keyed and 80% CBR is achieved. During rolling, slight sprinkling of water shall be done. Rolling shall not be done when the sub-grade is soft or yielding or when it causes a wave-like motion in the sub-grade or sub-base course. The rolled surface shall be checked transversely and longitudinally, with templates and any irregularities corrected by loosening surface adding or removing necessary amount of aggregates and re-rolling until the entire surface conforms to desired cross-fall (camber as per design) and

	grade. In no case shall the use of screenings to be permitted to make up depressions. Material which gets crushed excessively during compaction or becomes segregated shall be removed and replaced with suitable aggregates. It shall be ensured that shoulders are built up simultaneously along with water bound macadam courses 2.17.6 Application of Screenings After the coarse aggregate has been rolled to the specified CBR, screenings (11.2 mm down graded brick chips) to completely fill the interstices shall be applied gradually over the surface. These shall not be damp or wet at the time of application. Dry rolling shall be done while the screenings are being spread so that vibrations of the roller cause them to settle into the voids of the coarse aggregate. The screenings shall not be dumped in piles but be spread uniformly in successive thin layers either by the spreading motions of hand shovels or by mechanical spreaders, or directly from tipper with suitable grit spreading arrangement. Tipper operating for spreading the screenings shall be so driven as not to disturb the coarse aggregate. The screenings shall be applied at a slow and uniform rate (in three or more applications) so as to ensure filling of all voids. This shall be accompanied by dry rolling and brooming with mechanical brooms, handbrooms or both. In no case shall the screenings be applied so fast and thick as to form cakes or ridges on the surface in such a manner as would prevent the direct bearing of the rollers on the coarse aggregate. These operations shall continue until no more screenings can be forced into the voids of the coarse aggregate. 2.17.7 Sprinkling of Water and grouting After the screenings have been applied, the surface shall be copiously sprinkled with water, swept and rolled. Hand brooms shall be used to sweep the wet screenings into voids and to distribute them evenly. The sprinkling, sweeping and rolling operation shall be continued, with additional screenings applied as necessary until the coarse aggregate has been thoroughly keyed, well bonded and firmly set in its full depth and a grout has been formed of screenings. Care shall be taken to see that the base or sub-grade does not get damaged due to the addition of excessive quantities of water during construction.
	2.17.8 Setting and Drying After the final compaction of water bound macadam course, the pavement shall be allowed to dry overnight. Next morning hungry spots shall be filled with screenings or bindings material as directed, lightly sprinkled with water if necessary and rolled. No traffic shall be allowed on the road until the macadam has set. The compacted water bound macadam course should be allowed to completely dry and set before the next pavement course is laid over it. 2.17.9 Measurement Water bound macadam shall be measured as finished work in position in cubic metres following design.
	2.17.10 Payment The work measured shall be paid as per unit prices per Cum as shown in the Bill of Quantities which includes all cost of materials, equipment, labour, watering etc and other incidental charges & compensations whatever.
2.18 Providing Tack Coat	2.18.1 General The Work under this Clause consist of performing all Work required for

	the application of bituminous material to WBM base to provide bond for a superimposed premixed bituminous carpeting. The rate of surface coverage of the tack coat is 0.75 kg per m ² .																											
	2.18.2 Material i) Bitumen of Grade 80/100 The Bitumen shall conform to the following Specifications <table><tr><th>Property/Unit</th><th>Specification</th><th>Test Method</th></tr><tr><td>Penetration at 25°C</td><td>80-100</td><td>ASTM D5</td></tr><tr><td>Ductility at 25°C CMS</td><td>100 Min</td><td>ASTM D113</td></tr><tr><td>Softening point (°C)</td><td>45-52</td><td>ASTM D36</td></tr><tr><td>Loss on heating PCT WT</td><td>0.5 Max</td><td>ASTM D6</td></tr><tr><td>Drop in Penetration after heating (%)</td><td>20 Max</td><td>ASTM D5</td></tr><tr><td>Flash Point (°C)</td><td>250 Min</td><td>ASTM D92</td></tr><tr><td>Solubility in CS2 PCT WT</td><td>99.5 Max</td><td>ASTM D4</td></tr><tr><td>Density / S.G. at 25°C</td><td>1.00 / 1.05</td><td>ASTM D7</td></tr></table> The Contractor shall submit a certified Test Report of Bitumen from the reputed laboratory to the Engineer for review and approval. A copy of the certified analysis shall accompany each shipment of the Bitumen received on the Project site, and if the Bitumen is not in accordance with the Test Report, that will be rejected.	Property/Unit	Specification	Test Method	Penetration at 25°C	80-100	ASTM D5	Ductility at 25°C CMS	100 Min	ASTM D113	Softening point (°C)	45-52	ASTM D36	Loss on heating PCT WT	0.5 Max	ASTM D6	Drop in Penetration after heating (%)	20 Max	ASTM D5	Flash Point (°C)	250 Min	ASTM D92	Solubility in CS2 PCT WT	99.5 Max	ASTM D4	Density / S.G. at 25°C	1.00 / 1.05	ASTM D7
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Density / S.G. at 25°C	1.00 / 1.05	ASTM D7																										
	2.18.3 Equipment i) Power(bitumen) Distributor ii) Power Broom equipped with blower iii) Thermometer, hand tools etc The bitumen distributor shall have pneumatic tires of such width and number that the load produced on the binder course shall not exceed 116 Kg per cm of tire width, and shall be so designed, equipped, maintained and operated that bituminous material at even heat may be applied uniformly on variable widths of surface at readily determined and controlled rates per square metre, with a pressure range of from 1.76 to 5.27 kg per square centimeter, and with an allowable variation from the specified rate not to exceed five percent (5%). Distributor equipment shall include a tachometer, pressure gauges, volume measuring devices, and a thermometer for reading temperatures of tank contents.																											
	2.18.4 Construction																											
	2.18.4.1 Surface Preparations Immediately before applying the tack coat, if the surface is sufficiently bonded, the full width of surface to be treated shall be swept with a power broom equipped with a blower, supplemented by hand brooms, washed down with water, or otherwise cleaned to remove all loose dirt, clay, or other loose and objectionable material. After the operation of removing dust has been completed and prior to the application of the tack coat, the Engineer shall make an inspection of the existing pavement to determine its fitness to receive the bituminous material																											
	2.18.4.2 Weather Condition Tack coat shall not be applied during cold weather, after sunset, or to a wet surface. The tack coat shall be applied only when the temperature of the atmosphere is above 16 degrees (16°) Celsius.																											
	2.18.4.3 Heating and Application of Bituminous Material The application of the bituminous tack material shall be made by means of a pressure distributor of approved type, and shall be in the specified amounts. Contractor shall distribute undiluted amounts of bituminous material 0.75 kg per m². The quantity of material as measured by the volume measuring device of the distributor shall not vary from the true																											

	quantity, as herein specified, by more than (-ive) percent (5%). The bituminous material shall be applied at a temperature between one hundred seventy to one hundred eighty degrees (170° and 180°) Celsius. Necessary thermometers shall be supplied so that the temperature may be observed at all times. The surface shall be allowed to dry until it is a proper condition of tackiness to receive the Bituminous Carpeting course placement as is necessary to obtain this proper condition of tackiness. Until the wearing surface course is placed, the Contractor shall protect the tack coat from damage.
	2.18.5 Measurement Bituminous Tack Coat will be measured as finished work in position in square metres.
	2.18.6 Payment The work measured shall be paid as per unit prices per square metre as shown in the Bill of Quantities which includes all cost of materials, equipment, labour and other incidental charges & compensations whatever.
2.19 50 mm thick Premix Bituminous Carpeting	2.19.1 General The Work under this Clause consists of the performance of all Work required for the construction of a 50 mm thick Bituminous Carpeting pavement on the prepared base (WBM).
	2.19.2 Material i) Bitumen Grade- 80/100 ii) Aggregate- Stone Chips of 20 mm to 4 mm iii) Sand of FM$\geq$ 0.80 Bitumen: It should be of Grade 80/100 and shall conform to the specifications as specified in Sub-Clause 2.17.2 Aggregate : The aggregate shall consist of crushed stone of clean, hard, tough, durable rock of uniform quality and shall be clean, free from excess of dust, flat or elongated pieces, soft or disintegrated stone, clay or other deleterious matter. The size of the Stone Chips shall be 20 mm to 4 mm Physical requirement of coarse aggregates for premix bituminous carpet shall be as below: Coarse aggregate Stone Chips shall satisfy the following criteria: Water absorption as determined by STP 7.5 (or AASHTO T-85) or BS-812 shall not be more than 2 %. The Aggregate Impact Value (AIV) shall not exceed 30% limit as per BS 812: Part 3, Chapter 6. The percentage of wear according to Los Angeles Test shall not be more than 35 as per ASTM C535 Sand : Sand (FM $\geq$ 0.80) shall not contain any flint, chert or lime. The quantity of silt, clay and dust, determined in accordance with the decantation method given in BS 812, shall not exceed 3% by weight of the sample. The content of mica shall not exceed 3% by weight of the sample. The material shall not contain any deleterious material

	All fill materials shall be stockpiled outside the working areas. Materials shall be tested and approved by the Engineer before being used in construction of the Premix Bituminous Carpeting Pavement
	2.19.3 Equipment i) Bituminous Mixing Plant ii) Hauling Equipment iii) Paver iv) Roller Bituminous Mixing Plant: Contractor shall use an asphalt plant designed to dry aggregates; maintain accurate temperature control, and accurately proportion bitumen and aggregates. Contractor shall calibrate the asphalt plant not more than thirty (30) days in advance of production and furnish copies of the data to the Engineer at least one day prior to production bituminous mix. The asphalt plant shall have a scalping screen to prevent oversize material or debris from being incorporated into the mixture. Hauling Equipment: Trucks used for hauling asphalt mixtures shall have tight, clean, smooth metal beds which have been thinly coated with a minimum amount of paraffin oil, lime water solution, or other manufactured asphalt release agent. Diesel fuel or fuel oil shall not be used as an asphalt release agent. Each truck shall have a watertight canvas cover of such size as to extend at least one foot (1') over the sides and end of the truck bed and be adequately secured to protect the Stone Mastic Asphalt Concrete mixture. The use of the canvas cover shall be at the Engineer's direction. Paver: Asphalt pavers shall be self-propelled units provided with a heated vibratory screed. Grade and cross slope shall be controlled through the use of automatic grade and slope control devices. The paver screed control system shall be automatically actuated by the use of an erected string-line or a mobile string-line (ski) at least nine metre in length on the high side of the paver. Grade control shall be used on either (a) both the high and low sides, or (b) grade control on the high side and slope control on the low side. The paver shall be equipped with a receiving hopper having sufficient capacity for a uniform spreading operation. The hopper shall be equipped with a distribution system to place the bituminous mixture uniformly in front of the screed without segregation and/or tearing. The paver shall be capable of placing courses in thicknesses of from 15 mm to at least 75 mm, and, in width, be adjustable in increments 150mm to and one foot 300 mm. Roller: Sufficient Number of Rollers weighing eight (8) to twelve (12) tons to compact the mixture to the required density while maintaining the pace of the paving operations shall be made available by the Contractor. Rollers shall be of the static steel wheel or vibratory steel wheel type. The roller drums shall be a minimum of 2 metre wide. The rollers shall be self-propelled and capable of reversing without backlash. They shall be specifically designed to compact hot asphalt concrete mixtures. The use of equipment which results in crushing of the aggregate, or pick-up of the Stone Mastic Asphalt Concrete mixture will not be permitted.

	2.19.4 Construction: 2.19.4.1 Weather Limitation Premix Bituminous mixture shall not be placed when it is raining or when rain is imminent, on a wet surface, on an unstable/yielding roadbed, when the base material is frozen, or when weather conditions prevent proper handling or finishing of the mixture.
	2.9.4.2 Preparation of Paving Bitumen : The bitumen shall be heated at the paving plant to a temperature at which it can be properly handled through the pumping system, but at no time shall the temperature of the asphalt exceed that recommended by the bitumen supplier or manufacturer, or be greater than one hundred ninety degrees (190°) Celsius or less than one hundred seventy degrees (170°) Celsius
	2.19.4.3: Preparation and Handling of Aggregates: The aggregate for the Bituminous Carpeting mixture shall be heated and dried to a temperature compatible with the mix requirements specified. The Burner on the dryer shall be properly adjusted to avoid the presence of unburned fuel on the aggregate. Any Stone Bitumen mixture in which soot or fuel is present shall be wasted and no payment made.
	2.19.4.4 Mixing and Control: The aggregate and bitumen shall be combined uniformly in the Mixing Plant in the amounts as specified in the design (80 kg of bitumen to be mixed with 1.0 m³ of stone chips). The materials shall be mixed such that a complete and uniform coating of the aggregate is obtained. The temperature of the Bituminous mixture at the time of the mixing shall strictly be maintained at the specified degree (In between 170⁰ Celsius to .190⁰).
	2.18.4.5 Transportation of Mix: The dispatching of the hauling vehicles shall be so scheduled that all material delivered may be placed and rolled in daylight. When variations in size of loads, speed of trucks, length of haul, and conditions of trucks interfere with orderly continuous operations, the Engineer may order suitable corrections to be made
	2.18.4.6 : Mechanical Spreading Contractor shall submit a Paving Plan for the Engineer's review a minimum of five (5) working days prior to initiating paving operations. The plan shall consist of at least the following items: 1. Paving schedule to include sequence of operations. 2. Operational details to include: a. Plant operating capacity and target production rate. Process control testing frequency for gradation, moisture, asphalt cements content, and compaction. b. Number and capacity of trucks, cycle time, and delivery rate. c. The manufacturer and model of the paver and pick-up machine to include information on grade followers, sensors, operating speed, and roduction rate of the pavers. d. Number, type, weight, and operating speed of rollers, including replacement roller. e. Location and method of constructing longitudinal and transverse joints. f. Construction plan for paving intersections and driveways. 3. The Bitumen mix shall be placed on the road surface at a temperature not less than one hundred twenty degrees (120°) Celsius or greater one hundred fifty degrees (150°) Celsius. Additionally, the maximum

	temperature to which the bituminous mix is heated shall not exceed the supplier's recommendation. The bituminous mix temperature shall be measured directly behind the paver screed at the time of placement. The bituminous mix shall be laid upon a surface approved in writing by the Engineer. Immediately after applying the tack coat, the premix shall be spread to the required thickness (0.038 m³ mix shall cover an area of 1 m²) distributed evenly by means of a paver. Pavers shall be used to distribute the asphalt concrete mixture in lanes of such widths as to hold to a practical minimum the number of longitudinal joints required. Longitudinal joints and edges shall be constructed to true line markings. Lines shall be established parallel to the center line for the paver to follow in placing individual lanes. The paver shall be operated and positioned to closely follow the established line. When backing trucks to the finisher, care shall be taken not to jar the paver. The texture of the unrolled surface shall be checked to determine its uniformity. The adjustment of the screed, tamping, feed screws, hopper feed, etc., shall be checked frequently to assure uniform spreading of the mix. Segregation of the material shall not be permitted. If segregation occurs, the spreading operation shall be immediately suspended until the cause is determined and corrected. Any irregularities left by the paver shall be corrected by trimming directly behind the machine by use of lutes or covered rakes. Immediately after trimming, the edges of the course shall be thoroughly compacted by tamping. Distortion of the pavement during this operation shall be avoided.
	2.19.4.7 : Hand Spreading On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable, the bituminous mix shall be spread, raked, and luted by hand tools. For such areas, the bituminous mix shall be placed to the required compacted thickness and density.
	2.19.4.8 Compaction of Bituminous Mix Immediately after the bituminous mix has been spread, struck off and surface irregularities adjusted, it shall be thoroughly and uniformly compacted by rolling. The surface shall be rolled when the mixture is in the proper condition and when the rolling does not cause undue displacement, cracking, or shoving. Initial rolling shall be done with a steel-drum roller with the drive roll operating toward the paver, and/or a suitable pneumatic tired roller. Initial rolling shall be completed while the bituminous mat temperature is above one hundred seven degrees (107°) Celsius. Following the initial rolling at least three coverages of the pavement shall be completed with a drum/pneumatic tired roller, while the mat temperature is above 80 degrees (80°) Celsius. Final rolling shall be completed with a steel-drum roller and shall continue until roller marks and further compression are not evident in the pavement and specified density has been achieved. Unless otherwise directed, rolling shall begin at the sides and proceed longitudinally parallel to the road center line, each trip overlapping one-half the roller width, gradually progressing to the crown of the road. When paving in echelon or abutting a previously placed lane, the longitudinal joint should be rolled first followed by the regular rolling procedure. On superelevated curves the rolling shall begin at the low side and progress to the high side by overlapping of longitudinal trips parallel to the Centerline.

	To prevent adhesion of the mixture to the rollers, the wheels shall be kept properly moistened with water or water mixed with very small quantities of detergent or other approved material. Excess liquid will not be permitted.
	2.19.4.9 Joints The Contractor shall not construct longitudinal joints in the driving wheel paths. The Contractor shall align the joints of the top layer of pavement to either the centerline of the road or to lane lines. The Contractor shall offset the longitudinal joint in the top layer of pavement not more than 15 cm (15 cm) from centerline of edge of stripe. Joints shall be constructed to ensure a continuous bond between old and new sections of the course. All joints shall present the same texture and smoothness as other sections of the course. The Contractor shall offset the longitudinal joints in the top layer from the joint in the layer immediately below by at least 10 cm (10 cm). Transverse joints shall be formed by saw cutting back on the previous run to expose the full depth of the course or by using a removable bulkhead. Transverse joints shall not be perpendicular to centerline, but shall be skewed between fifteen and twenty-five degrees (15° and 25°).
	2.19.4.10 Spreading Sand On completion of the rolling and formation of joint as specified above, the Bituminous Carpeting shall be covered with pure sand of FM$\geq$ 0.80 at the rate 0.012 m³ per square metre of the surface area. Sand shall be spread uniformly. Care should be taken that no surface of the carpeting is left uncovered by sand spreading
	2.19.5 Measurement Measurement of premix bituminous carpeting shall be measured by the completed and accepted work in m². The area measured will be that which is shown on the Drawings.
	2.19.6 Payment The work measured shall be paid as per unit prices per square metre as shown in the Bill of Quantities which includes all cost of materials, equipment, labour, watering etc and other incidental charges & compensations whatever.
2.20 9 mm thick Premix Bituminous Seal Coat	2.20.1 General A premix Bituminous Seal Coat shall be applied over premix bituminous carpet immediately after laying of carpet to ensure proper bond.
	2.20.2 Material i) Peagravel ii) Bitumen iii) Sand Peagravel: It should be screening of stone gravels of 6 mm size passing through 10 mm sieve and retained on 2.36 mm sieve. Bitumen: It should be of Grade 80/100 and shall conform to the specifications as specified in Sub-Clause 2.17.2 Sand: Sand (FM $\geq$ 0.80) shall not contain any flint, chirp or lime. The quantity of silt, clay and dust, determined in accordance with the decantation method given in BS 812, shall not exceed 3% by weight of the sample. The content of mica shall not exceed 3% by weight of the sample. The material shall not contain any deleterious material
	2.20.3 Equipment i) Bituminous Mixing Plant

	ii) Hauling Equipment iii) Paver iv) Roller
	2.20.4 Construction
	2.20.4.1 Surface Preparation Immediately before laying of the seal coat , the full width the surface of the bituminous carpeting , shall be swept with a power broom equipped with a blower, supplemented by hand brooms, washed down with water, or otherwise cleaned to remove all loose dirt, clay, sand or other loose and objectionable material.
	2.20.4.2 Preparation and Handling of Pea Gravel The peagravel for the Seal Coat mixture shall be heated and dried to a temperature compatible with the mix requirements specified. The Burner on the dryer shall be properly adjusted to avoid the presence of unburned fuel on the aggregate. Any peagravel Bitumen mixture in which soot or fuel is present shall be wasted and no payment made
	2.20.4.3 Heating of Bitumen The bitumen shall be heated at the paving plant to a temperature at which it can be properly handled through the pumping system, but at no time shall the temperature of the asphalt exceed that recommended by the bitumen supplier or manufacturer, or be greater than one hundred ninety degrees (190°) Celsius or less than one hundred seventy degrees (170°) Celsius
	2.20.4.4 Mixing of the Seal Coat The Peagravel and bitumen shall be combined uniformly in the Mixing Plant in the amounts as specified the design (80 kg of bitumen to be mixed with 1.0 m³ of peagravels) . The materials shall be mixed such that a complete and uniform coating of the aggregate is obtained. The temperature of the Bituminous mixture at the time of the mixing shall strictly be maintained at the specified degree (In between 170° Celsius to .190°) .
	2.20.4.5 Transportation of the Mix The dispatching of the hauling vehicles shall be so scheduled that all material delivered may be placed and rolled in daylight. When variations in size of loads, speed of trucks, length of haul, and conditions of trucks interfere with orderly continuous operations, the Engineer may order suitable corrections to be made
	2.20.4.6 Mechanical Spreading of the Mix The Mix shall be spread by paver in such a way that 0.015 m³ hot mix covers a surface area of 1 m² . The Bitumen mix shall be placed on the bituminous carpeting at a temperature not less than one hundred twenty degrees (120°) Celsius or greater one hundred fifty degrees (150°) Celsius. Additionally, the maximum temperature to which the bituminous mix is heated shall not exceed the supplier's recommendation. The bituminous mix temperature shall be measured directly behind the paver screed at the time of placement. The texture of the unrolled surface shall be checked to determine its uniformity. The adjustment of the screed, tamping, feed screws, hopper feed, etc., shall be checked frequently to assure uniform spreading of the mix. Segregation of the material shall not be permitted. If segregation occurs, the spreading operation shall be immediately suspended until the cause is determined and corrected
	2.20.4.7 Hand Spreading On areas where irregularities or unavoidable obstacles make the use of

	mechanical spreading and finishing equipment impracticable, the bituminous mix shall be spread, raked, and luted by hand tools. For such areas, the bituminous mix shall be placed to the required compacted thickness and density
	2.20.4.8 Rolling of Mix Immediately after the bituminous mix has been spread, struck off and surface irregularities adjusted, it shall be thoroughly and uniformly compacted by rolling. The surface shall be rolled when the mixture is in the proper condition and when the rolling does not cause undue displacement, cracking, or shoving. Initial rolling shall be completed while the bituminous mat temperature is above one hundred seven degrees (107°) Celsius. Following the initial rolling at least three coverages of the pavement shall be completed with a drum/pneumatic tired roller, while the mat temperature is above 80 degrees (80°) Celsius. Unless otherwise directed, rolling shall begin at the sides and proceed longitudinally parallel to the road center line, each trip overlapping one-half the roller width, gradually progressing to the crown of the road. When paving in echelon or abutting a previously placed lane, the longitudinal joint should be rolled first followed by the regular rolling procedure. On superelevated curves the rolling shall begin at the low side and progress to the high side by overlapping of longitudinal trips parallel to the Centerline. To prevent adhesion of the mixture to the rollers, the wheels shall be kept properly moistened with water or water mixed with very small quantities of detergent or other approved material. Excess liquid will not be permitted.
	2.20.4.9 Sand Spreading On completion of the rolling as specified above, the Seal Coat shall be covered with pure sand of FM$\geq$ 0.80 at the rate 0.01 m³ per square metre of the surface area. Sand shall be spread uniformly. Care should be taken that no surface of the carpeting is left uncovered by sand spreading. After spreading the sand, some passes of the drum roller shall be carried out to achieve a smooth surface of the Seal Coat.
	2.20.5 Measurement Measurement of premix seal coat shall be measured by the completed and accepted work in m². The area measured will be that which is shown on the Drawings
	2.20.6 Payment The work measured shall be paid as per unit prices per square metre as shown in the Bill of Quantities which includes all cost of materials, equipment, labour, watering etc and other incidental charges & compensations whatever.

Section 9. Drawings

List of Drawing under this Contract are given below. The Drawings are attached in separate Volume

Sl No.	Drawing No.	Date
1	NWZ/4(B)-7026	03-12-2013
2	NWZ/4(B)-7027	03-12-2013
3	NWZ/4(B)-7028	03-12-2013
4	NWZ/4(B)-7029	03-12-2013
4	NWZ/4(B)-7030	03-12-2013
5	NWZ/4(B)-7031	03-12-2013
6	NWZ/4(B)-7032	03-12-2013
7	NWZ/4(B)-7033	03-12-2013
8	NWZ/4(B)-7034	03-12-2013
9	NWZ/4(B)-7035	03-12-2013
10	NWZ/4(B)-7036	03-12-2013
11	NWZ/4(B)-7037	03-12-2013
12	NWZ/4(B)-7038	03-12-2013
13	NWZ/4(B)-7040	03-12-2013
14	NWZ/4(B)-7041	03-12-2013
15	NWZ/4(B)-7042	03-12-2013
16	NWZ/4(B)-7043	03-12-2013
17	NWZ/4(B)-7044	03-12-2013
18	NWZ/4(B)-7045	03-12-2013

APPENDIX-A

Schedule of Road Transport for the Project Director/ Deputy Project Director, Engineer and Staffs

A. 4 WD Vehicle

The Contractor shall provide 2 (Two) Nos. 4 WD Vehicle as specified below for exclusive and full time use of the Project Director, Deputy Project Director, Engineer and his officers/staff for the entire duration of the Contract. The transport shall be brand new and of makes approved by the Project Director/Deputy Project Director of PMU, CDRSB. The Contractor shall complete registration of the vehicles in favor of PD, PMU, CDRSB, BWDB with necessary decoration. The Contractor shall supply fuel & lubricant for full time use of the Transport and provide experienced and skilled driver for smooth operation of the transport. The transport is to be maintained by the Contractor properly as and when needed during the whole period of Contract including all sorts of repairing and replacement of parts. Supply of the Vehicle must be accomplished within 60(sixty) days after signing the Contract Agreement; otherwise cost of fuel & lubricant, maintenance and remuneration of driver for the lapse shall be adjusted from the payment certificate. Such adjustment will be effected from date of signing of the Contract Agreement.

The Transport shall have to be handed over to the Project Authority on completion of the Contract.

ROAD TRANSPORT- 2 No

4 WD LWB (Long Wheel Base) Gasoline driven Vehicles

Year of Manufacturing - Not earlier than 2012

Country of Origin- Japan/ UK/Germany/ France/ USA

Displacement- 2690 CC (minimum)

Nos of Door- 5 (4 side doors and 1 back door)

Minimum external dimension- 4750 mm×1880mm×1850mm (length×width×height)

Seating Capacity – Minimum 7 persons (including driver)

Minimum turning radius – 5.8 m

Fuel Tank Capacity - 85 L (minimum)

Head Light – Halogen

Door Mirror- Power Adjustable & Auto Retractable Mirror with integrated turn indicators

Power Window

Central locking System- Full Auto

Air Conditioner- Climate Control Air Conditioning

Radio, CD Players, 6 Speakers

Air bags for driver seat and passengers seats

Cruise Control, Multi Communication System Satellite navigation , voice activated Bluetooth, ipad Connectivity

6 spoke alloy wheel

Fog lamp

Chrome Fog lamp bezel

Auto ON/OFF HID Headlamps and Auto leveling

Front Grille

Side Step Bar

Electro chromatic rear view mirror

Privacy Glass

Rear Roof Spoiler with High mount stop Lamp , Smart Entry & Push Start System

The Vehicle shall be for on and off road use of sturdy construction, hard top manufactured by reputed International Manufacturer ISO accredited. Seats shall be made of color co-coordinated lather with high back providing lumbar support. The Contractor shall take approval on specifications of the Vehicles from the Project Director or Deputy Project Director of PMU, CDRSB.

B 2 Wheel Motorbike – 4 Nos

The Contractor shall provide, operate and maintain brand new 4 (four) Nos. licensed Motor Cycle (125 CC minimum) as specified below with all accessories including supplying of fuel & lubricant for the Use of Project Director and Engineer's personnel. The Motor Cycle shall be of 2(two) wheeled petrol operated, manufactured by Internationally reputed Manufacturing Company ISO accredited , proved good performances, smooth running both on and off the road and elegant look. Year of manufacturing of the Motor Cycle would not be earlier than 2013. The Contractor shall take approval on specifications of the Motor Cycle from the Project Director or Deputy Project Director of PMU, CDRSB.

The Transport shall have to be handed over to the Project Authority on completion of the Contract.

A- Engine

Type - Air cooled 4-Stroke Single Cylinder OHC

Displacement - minimum 124.5 CC

Maximum Power- 7 KW (9.4 BHP) @ 7000 rpm

Bore × Stroke (minimum) - 52× 57.5 mm

Compression Ratio- 9.1: 1

Starting- Self Start/ Kick

Ignition- AMI (Advanced Microprocessor Ignition System)

B- Transmission & Chassis

Clutch- Multi plate Wet

Gear Box- 4 Speed Constant Mesh

Chassis Type- Tubular Double Cradle Type

Front- Telescopic Hydraulic shock absorber

Rear- Swing Arm with hydraulic shock absorber

APPENDIX-B

Schedule of Training of the Project Officials (Engineering)

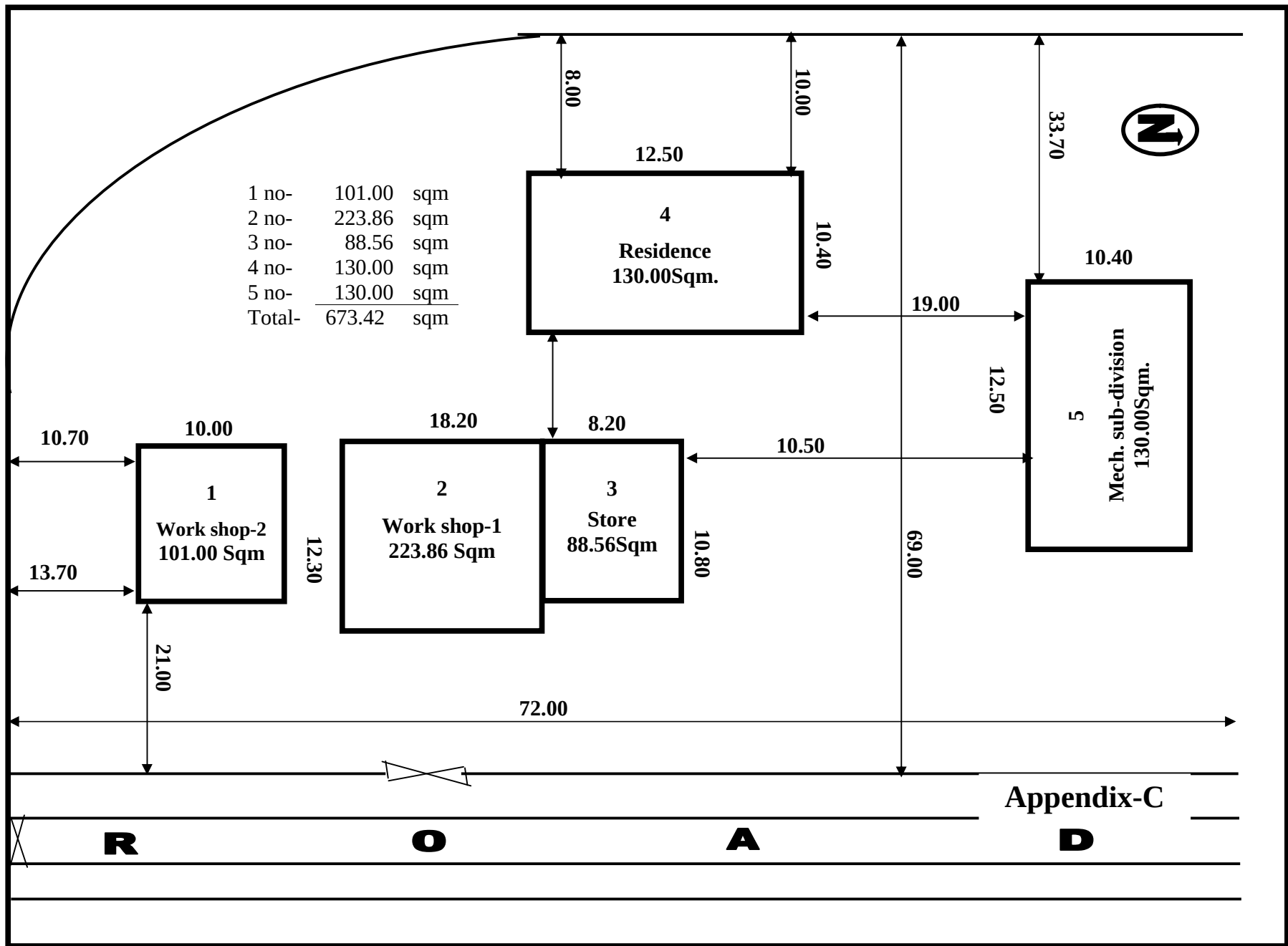
The Contractor shall arrange Training of the Project Officials (Engineering) on different aspect of River Bank Protective Works/River Training Works of Mighty River (like Brahmaputra) and Land Reclamation through River Dredging & Management of Reclaimed Land in any country of Europe through site visit of completed works and ongoing works in addition to classroom deliberation. The content of Training Module is described below but shall not be limited to it;

1. The need for river training/ River bank Protection Works
2. Revetment, Afflux bunds, approach embankments, groynes, spurs, etc. for river waterway control and other advanced technique of River Bank Protection Works
3. The issues of riverbank failure and lateral migration of rivers
4. Different modes of bank failure
5. Techniques for bank stabilization
6. Land Reclamation Process through River Dredging
7. Management and Improvement of Reclaimed Land
8. Any other aspects as deemed fit for successful River bank Protection work/ River Training works & Land Reclamation

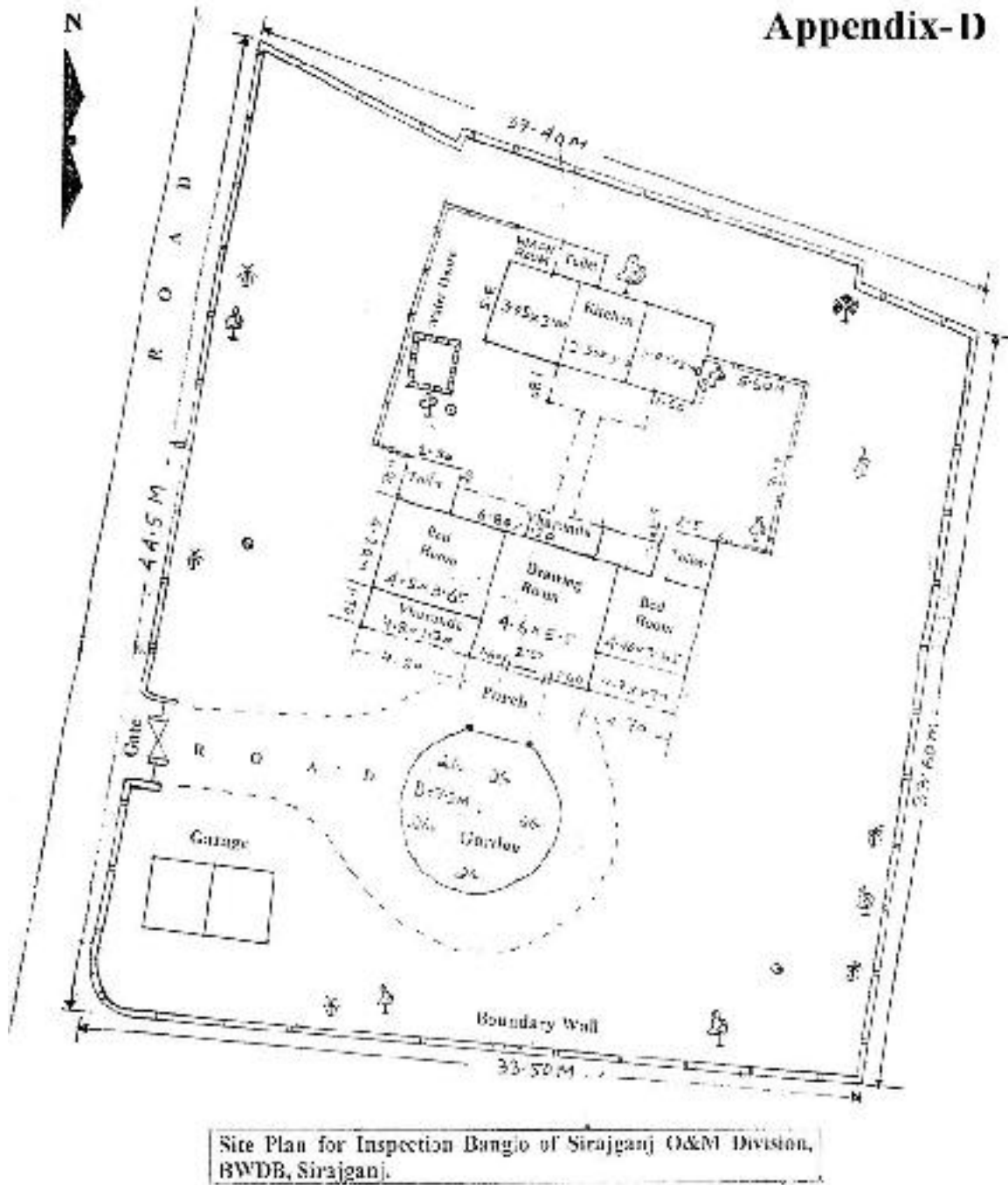
Duration of Training- 28 (twenty) days (excluding travelling period from Bangladesh and back)

Person to be trained –8 (eight)

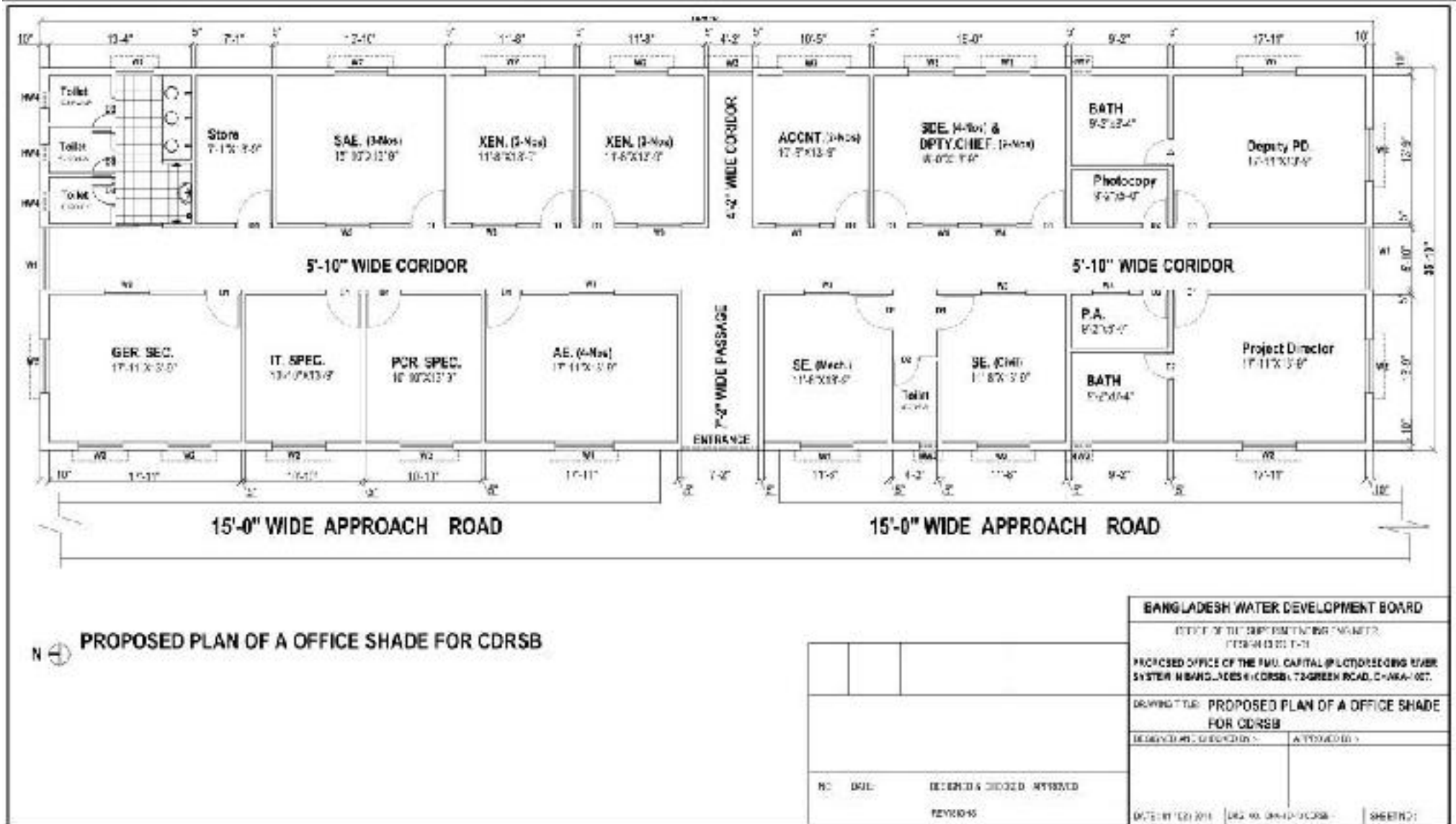
The Contractor shall bear all the expenses to be incurred for the 2 way journey by air to the country of Europe (to be proposed by the Contractor and approved by the Project Director/Deputy Project Director) and back, foodstuff, accommodation, internal journeys, DSA (Daily Subsistence Allowance) and other costs for entire period of training. The Contractor shall arrange the Training within 2(two) months after signing the Contract Agreement.



Appendix-D



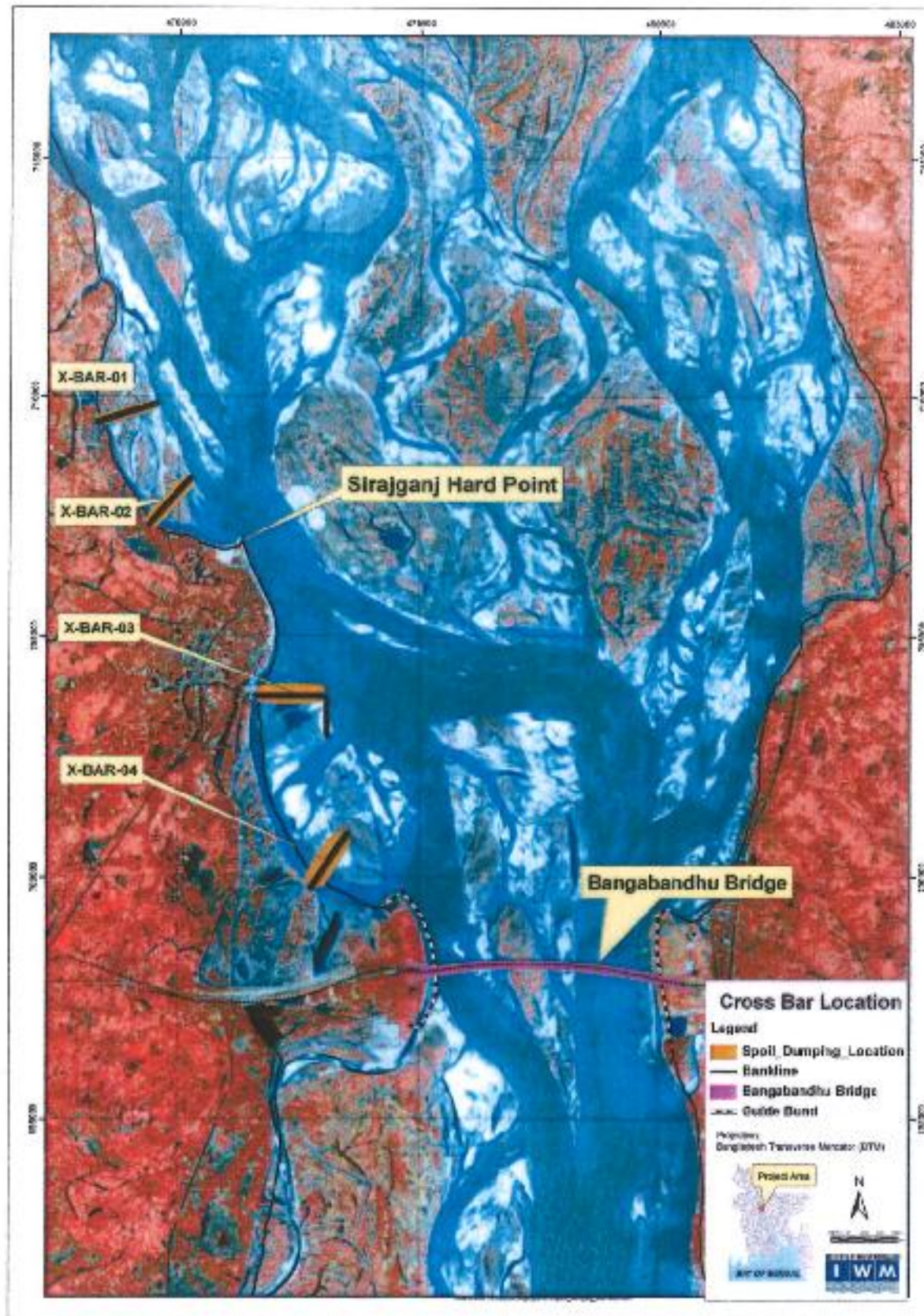
APPENDIX-E



NOTES :

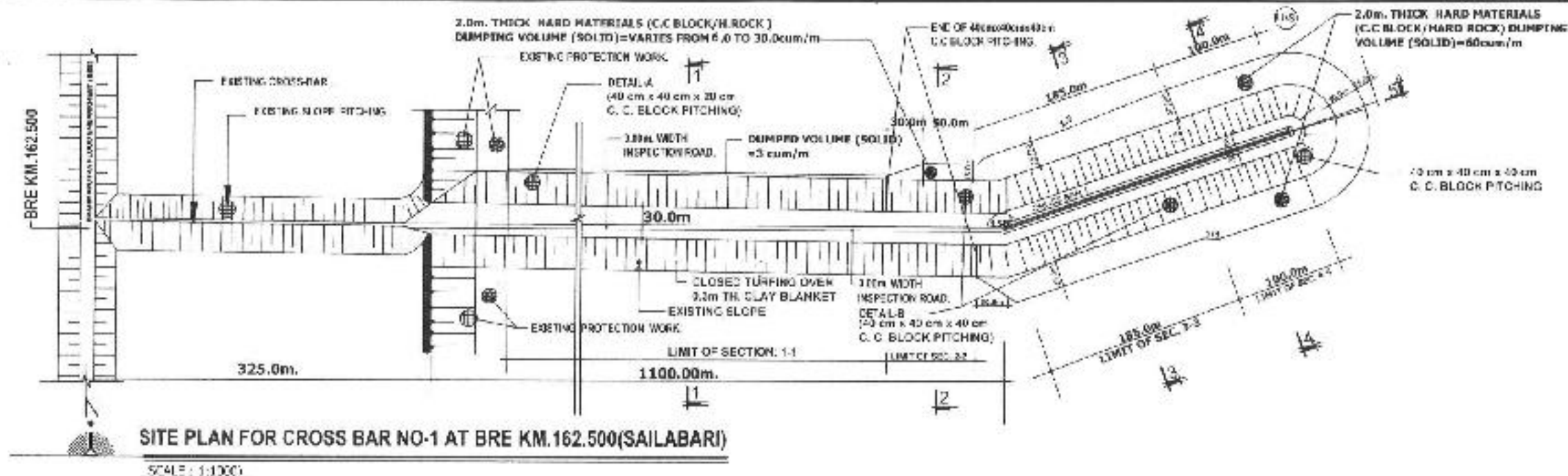
- CROSS BARS SHALL BE CONSTRUCTED WITH TOP ELEVATION OF +16.00 m PWD.
- CENTER LINE COORDINATES OF CROSS BARS :

CROSS BAR-1 :	CROSS BAR-2 :
469480 E, 709900 N	470267 E, 708200 N
469315 E, 709833 N	469638 E, 707517 N
469052 E, 709841 N	469448 E, 707319 N
468639 E, 709848 N	
468663 E, 709853 N	CROSS BAR-3 : 473237 E, 703817 N TO 471496 E, 703658 N
468436 E, 709853 N	(EXISTING CLOSURE NO-1)
468291 E, 709857 N	
468183 E, 709860 N	CROSS BAR-4 : 472517 E, 699972 N TO 473651 E, 700558 N



LOCATION MAP OF CROSS BARS

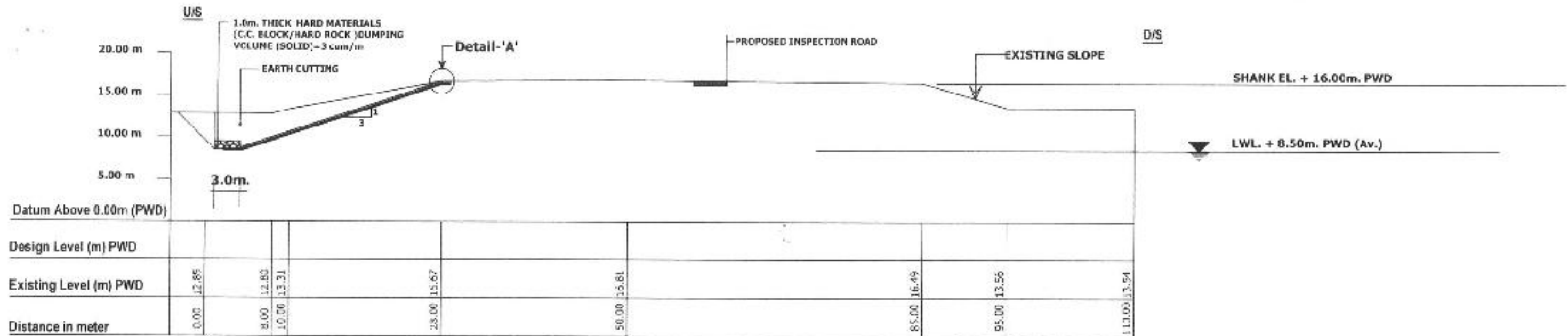
BANGLADESH WATER DEVELOPMENT BOARD									
OFFICE OF THE SUPERINTENDING ENGINEER DESIGN CIRCLE - VI									
4					INDEX MAP SHOWING LOCATION OF 4-NOS CROSS BAR CONSTRUCTED UNDER THE PROJECT 'CAPITAL PILOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CDRSB)' AT BRE KM 162.500, KM 165.000, KM 169.110 & KM 175.00 IN UPAZILLA SIRAJGANJ SADAR, DIST. SIRAJGANJ UNDER SIRAJGANJ O&M DIVISION, BWDB, SIRAJGANJ DURING THE FY 2013-2014 TO 2014-2015.				
3					DESIGNED : <i>Fazana</i> (FAZZANA ABBEEN) S.D.E.				
2					DRAWN : (MD. MONIRUL ISLAM)				
1					TRACED : CHECKED : <i>Motaher</i> (MOTAHER HOSSAIN) E.E.				
DN	DATE	MADE	CHECK	RECD	APPROV	RECOMMENDED : <i>Hasan</i> (MD. HASAN PARVEZ) S.E.			
R E V I S I O N S						APPROVED : <i>Jati Das Kundu</i> (JATI DAS KUNDU) CHIEF ENGINEER, DESIGN			
DATE : 03-12-2013						DWG. NO. NWZ/4(B)-7026			



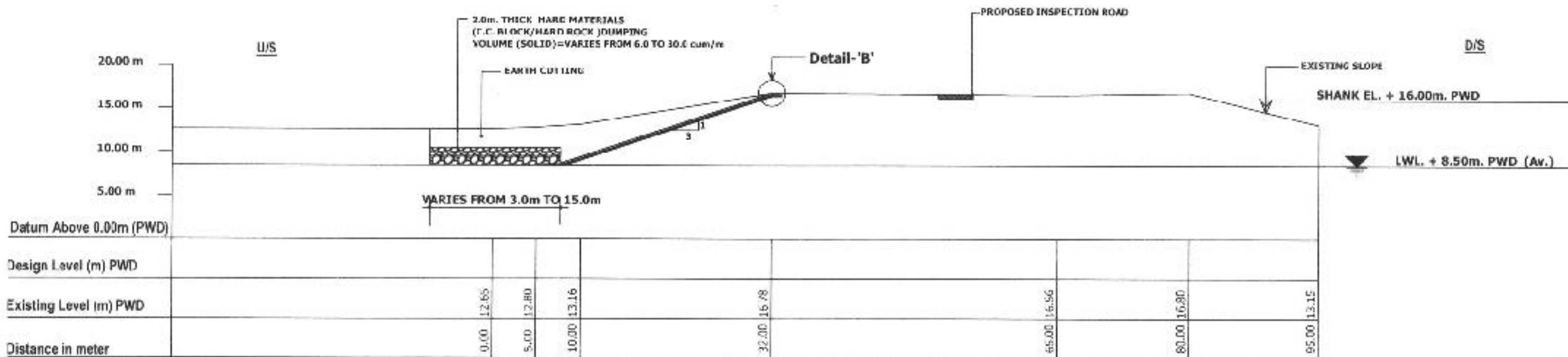
NOTES:

1. FOR LOCATION OF CROSS BARS/CLOSURES SEE REF. DWG NO.NW2/4(B) /026 DATE: 03.12.2013 & FOR DETAILS OF ROAD SEE REF. DWG NO.NW7/4(B) 7045 DATE: 03.12.2013.
2. HARD MATERIALS USED IN ASSORTED LAUNCHING APRON SHALL BE BY VOLUME (SOLID) & GRADATION ARE AS FOLLOWS:
- | C.C.BLOCKS | | HARD ROCK |
|------------------------|----|------------------------------|
| a) 50cmX50cmX30cm- 30% | OR | a) 30cm to 45cm IN SIZE- 50% |
| B) 45cmX45cmX45cm- 50% | | b) 45cm & ABOVE IN SIZE- 50% |
| b) 40cmX40cmX40cm- 20% | | |
3. 40 cm x 40 cm x 40 cm & 40 cm x 40 cm x 20 cm C.C. BLOCK SHALL BE PLACED AS SHOWN IN THE SECTIONS.
4. CONCRETE FOR C.C. BLOCK SHALL HAVE MINIMUM COMPRESSIVE STRENGTH OF 9N/mm² AT 28 DAYS CYLINDER TEST.
5. 100 mm. THICK SAND FILTER (F.M. 1.0 TO 1.5) SHALL BE PLACED UNDER THE RECOMMENDED GEOTEXTILE FILTER CLOTH OF BWDB STANDARD SCHEDULE ITEM NO. 40-600-40.
6. 100 mm. THICK WELL GRADED KHOA FILTER (40mm TO 20mm & 20mm TO 5mm) SHALL BE PLACED OVER RECOMMENDED GEOTEXTILE FILTER CLOTH AS SHOWN IN SECTIONS.
7. EARTH WORK IN FILLING IN CONSTRUCTION / RE-SECTIONING OF EARTHEN SHANK & BELL MOUTH SHALL BE DONE BY COMPACTED BORROWING EARTH FROM RIVER BED (MENSION AS BWDB STANDARD SCHEDULE ITEM NO. 16-440) FILLING OF 85% STANDARD PROCTOR DENSITY.
8. ADEQUATE (MINIMUM-10%) QUANTITY OF STOCK PILE OF HARD MATERIALS (C.C.BLOCK/HARD ROCK) SHALL BE MADE AVAILABLE TO USE DURING EMERGENCY.
9. 250KG SAND FILLED GEO-BAGS ABOVE LWL USED DURING EMERGENCY SALVAGED AND REUSED BELOW LWL TO BUILD UP THE SLOPE WHENEVER APPLICABLE.
10. AS THIS WORK WILL BE DONE IN PERIOD OF TWO YEARS. ADEQUATE QUANTITY OF 250KG SAND FILLED GEO-BAGS SHOULD BE KEPT RESERVE TO PROTECT THE ON GOING WORK.
11. ANY OMISSION / CORRECTION SHALL HAVE TO BE INFORMED IMMEDIATELY TO THE DESIGN OFFICE.
12. THE WORK SHOULD BE EXECUTED AFTER OBTAINING ADMINISTRATIVE AND FINANCIAL APPROVAL FROM COMPETENT AUTHORITY.
13. THIS DRAWING IS PREPARED AS PER PROPOSAL & DESIGN DATA SUBMITTED BY PROJECT DIRECTOR, CAPITAL PILOT DREDGING OF RIVER SYSTEM IN BANGLADESH(CDRSBI, BWDB, DHAKA. VIDE HIS OFFICE MEMO NO.PD/PMU CDRSB/D-1/767. DATE: 10.09.2013..

						BANGLADESH WATER DEVELOPMENT BOARD																															
						OFFICE OF THE SUPERINTENDING ENGINEER DESIGN CIRCLE - VI																															
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						4																															
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01	DATE	DATE	DATE	DATE	DATE																																
						DESIGNED BY:  (FORQAN AFTAB) S.E.	RECOMMENDED BY:  (IMD HASAN FARVEEZ) S.E.																														
						DRAWN BY: MD. MONIRUL ISLAM	APPROVED:  (SAYED QASIM KUNDU) CIVIL ENGINEER, DESIGN																														
						CHECKED BY:  (MOTAHAR HOSSAIN) S.E.	DATE: 30.12.2013																														
REVISIONS						DWG. NO. NW/274/B5-2012																															



**TYPICAL CROSS SECTION OF PROPOSED PROTECTIVE WORK AT
M. 900.00 (SEC. 1-1)**

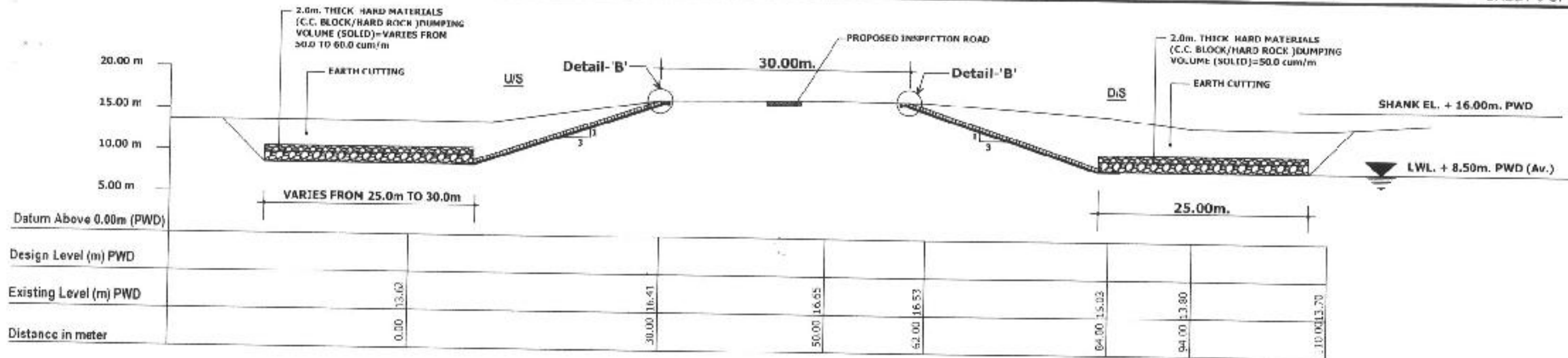


TYPICAL CROSS SECTION OF PROPOSED PROTECTIVE WORK AT M. 1400.00 (SEC. 2-2)

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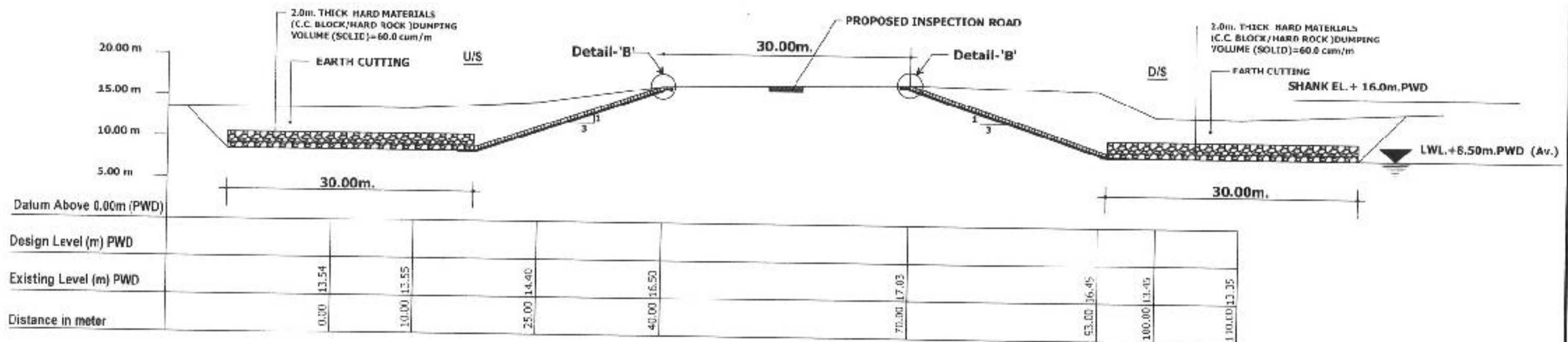
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REVISIONS					

BANGLADESH WATER DEVELOPMENT BOARD	
OFFICE OF THE SUPERINTENDING ENGINEER DESIGN CIRCLE - VI	
PROPOSED PROTECTIVE WORK OF CROSS BAR NO-1 UNDER THE PROJECT "CAPITAL PILOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CORSB)" AT BRE KM.162.500 (SAILABARI) IN UPAZILLA SIRAJGANJ SADAR, DIST. SIRAJGANJ UNDER SIRAJGANJ O&M DIVISION, BWDB, SIRAJGANJ DURING THE FY. 2013-2014 TO 2014-2015.	
DESIGNED : <i>Farzana Afreen</i> (FARZANA AFREEN) S.D.E.	RECOMMENDED : <i>MD. HASAN PARVEZ</i> (MD. HASAN PARVEZ) S.E.
DRAWN : MD. MONIRUL ISLAM	APPROVED : <i>Jati Das Kundu</i> (JATI DAS KUNDU) CHIEF ENGINEER, DESIGN
TRACED : <i>Motaher Hossain</i> (MOTAHER HOSSAIN) E.E.	DATE : 03.12.2013
CHECKED : <i>Motaher Hossain</i> (MOTAHER HOSSAIN) E.E.	DWG. NO. NWZ/4(B)-7028



TYPICAL CROSS SECTION OF PROPOSED PROTECTIVE WORK AT M. 1525.00 (SEC. 3-3)

SCALE : 1cm. = 100m.



TYPICAL CROSS SECTION OF PROPOSED PROTECTIVE WORK AT M. 1650.00 (SEC. 4-4)

SCALE : 1cm. = 100m.

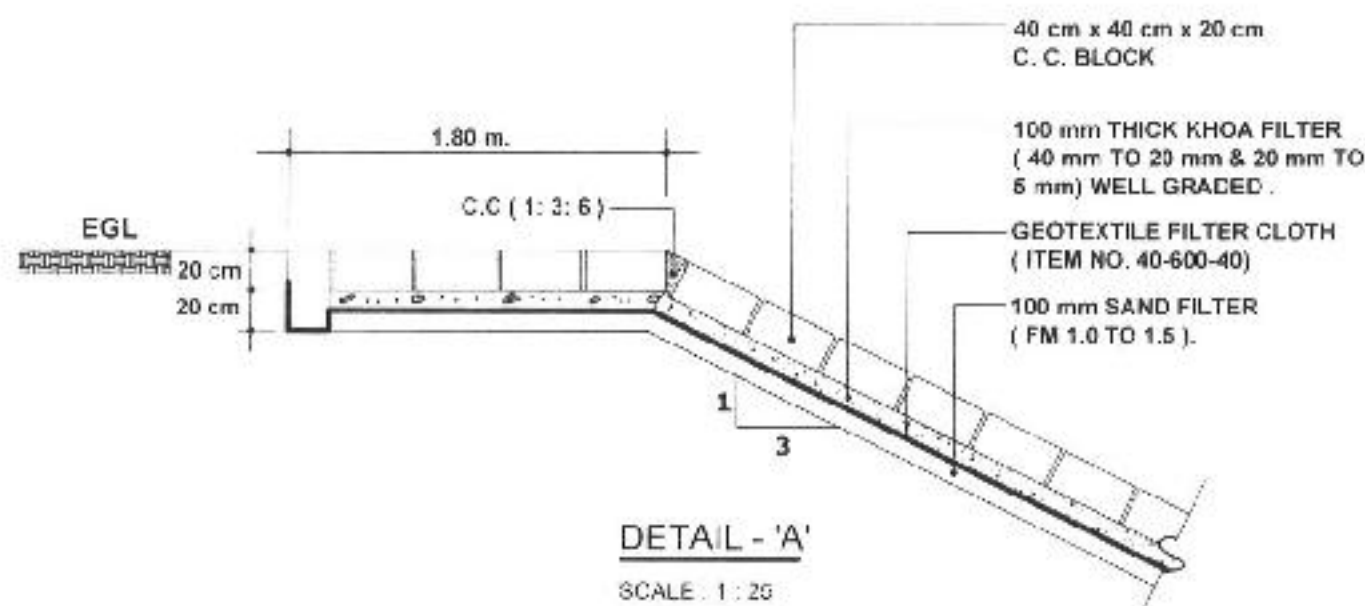
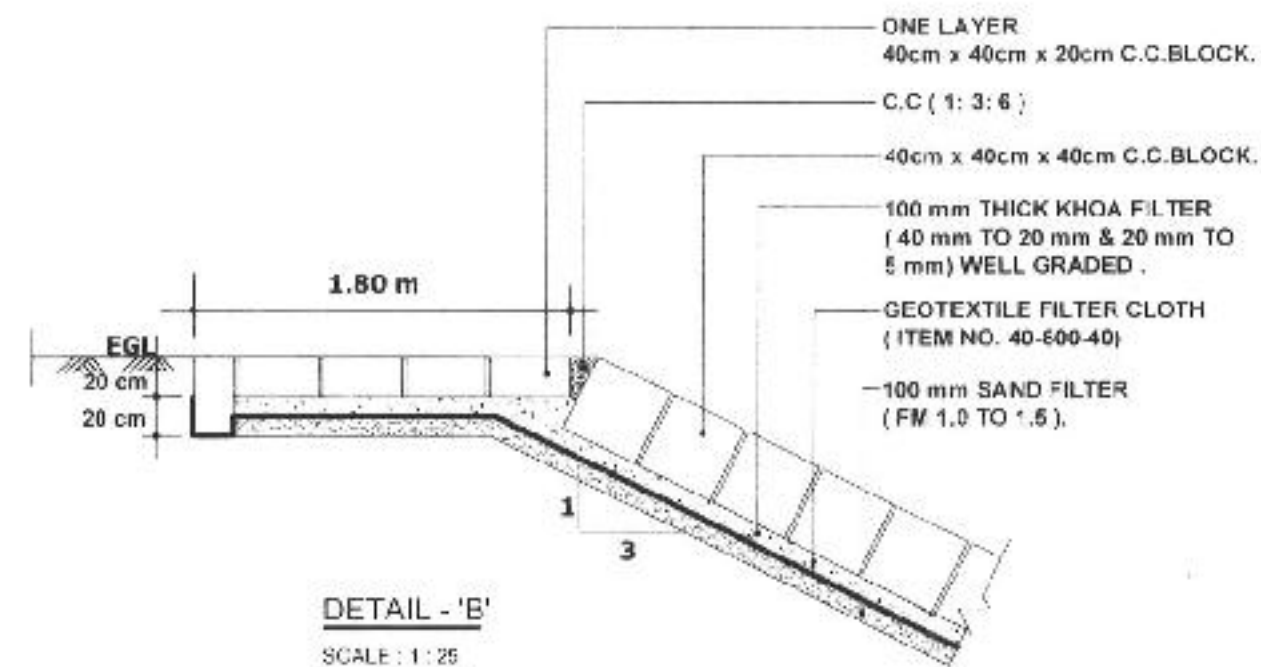
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REVISIONS					

BANGLADESH WATER DEVELOPMENT BOARD	
OFFICE OF THE SUPERINTENDING ENGINEER DESIGN CIRCLE - VI	
PROPOSED PROTECTIVE WORK OF CROSS BAR-NO-1 UNDER THE PROJECT "CAPITAL PILOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CORSB)" AT BRE KM.162.500 (SAILABARI) IN UPAZILLA SIRAJGANJ SADAR, DIST. SIRAJGANJ UNDER SIRAJGANJ O&M DIVISION, BWDB, SIRAJGANJ DURING THE FY. 2013-2014 TO 2014-2015.	
DESIGNED : <i>Farzana</i> (FARZANA AFREEN) S.D.E.	RECOMMENDED : <i>Hasan</i> (MD. HASAN PARVEZ) S.E.
DRAWN : MD. MONIRUL ISLAM	APPROVED : <i>Jati Das Kundu</i> (JATI DAS KUNDU) C-11E ENGINEER, DESIGN
TRACED : <i>Motaher</i> (MOTAHER HOSSAIN) C.L.	DATE : 03.12.2013
CHECKED : <i>Motaher</i> (MOTAHER HOSSAIN) C.L.	DWG. NO. NWZ/4(E)-7029

LWL. + 8.50m. PWD (Av.)

Datum: Above (-)5.0m (PWD)									
Design Level (m) PWD									
Existing Level (m) PWD	15.70	15.72	16.11	15.45	6.40	5.00	2.00		
Distance in meter	0.00	10.00	23.00	27.00	40.00	60.00	70.00		

SCALE : 1cm. = 100m.



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1					
DN	DATE	MADE	CHG'D	RECD	APP'D

REVISIONS

BANGLADESH WATER DEVELOPMENT BOARD

OFFICE OF THE SUPERINTENDING ENGINEER
DESIGN CIRCLE - VI

PROPOSED PROTECTIVE WORK OF CROSS EAR NO-1 UNDER THE PROJECT "CAPITAL PILOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CORSB)' AT BRE KM.162.500 (SAILABARI) IN UPAZILLA SIRAJGANJ SADAR, DIST. SIRAJGANJ UNDER SIRAJGANJ O&M DIVISION, BWDB, SIRAJGANJ DURING THE FY. 2013-2014 TO 2014-2015.

DESIGNED BY: EAJ/DEM
(FARZANA AFREEN) S.D.E.

DRAWN : HD. MONIRUL ISLAM

TRACED :

CHECKED	
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(NOTARIER HOSSAIN) E.E.

DATE	DATE	03.12.2013
------	------	------------

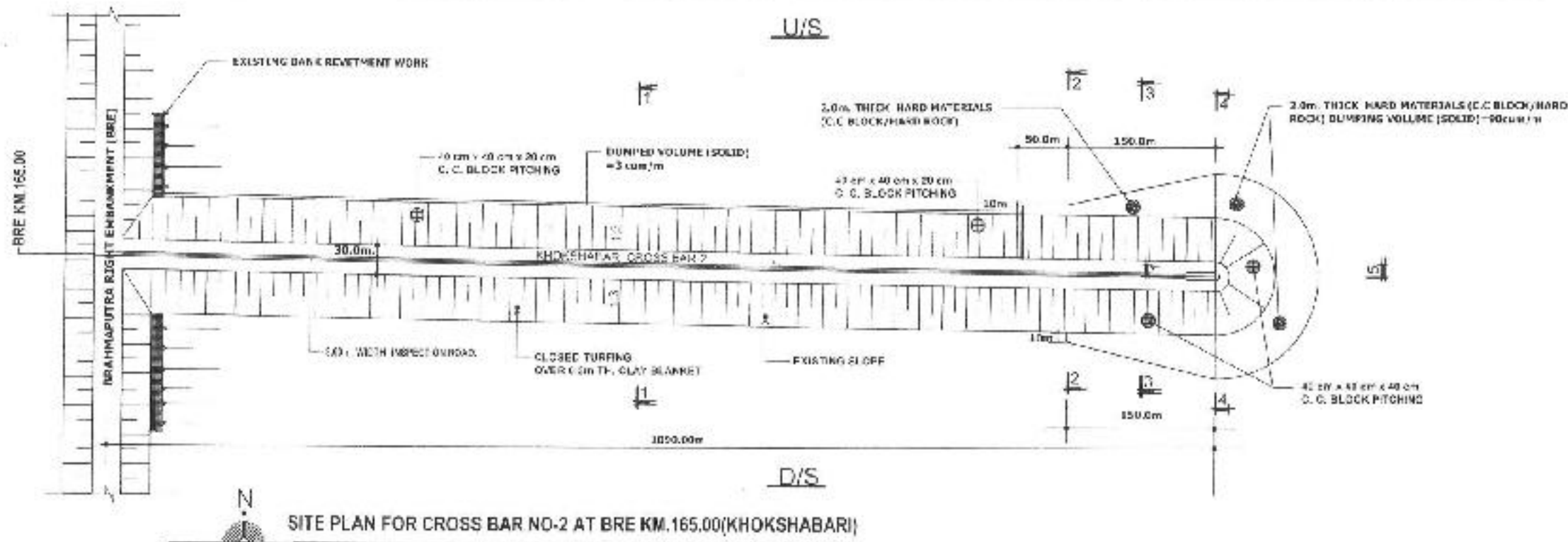
	RECOMMENDED
--	-------------

(MD. HASAN PARVEZ) S.D.

අනුරාධපුරය

(JATI DAS KUNDU)
CHIEF ENGINEER, DESIG

DWG. NO. RVZ/4(B) 7030



SITE PLAN FOR CROSS BAR NO-2 AT BRE KM.165.00 (KHOKSHABARI)

SCALE : 1:1000

NOTES:

- FOR LOCATION OF CROSS BARS/CLOSURES SEE REF. DWG NO. BWZ/4(B) 7028 DATE: 03.12.2012 & FOR DETAILS OF ROADS SEE REF. DWG NO. BWZ/4(B) 7045 DATE: 03.12.2012.
- HARD MATERIALS USED IN ASSORTED LAUNCHING APRON SHALL BE BY VOLUME (SOLID) & GRADATION ARE AS FOLLOWS:

C.C. BLOCKS	HARD ROCK
a) 50cm x 50cm x 50cm - 50%	a) 30cm TO 45cm Th SIZE - 50%
b) 45cm x 45cm x 45cm - 50%	b) 45cm & ABOVE IN SIZE - 50%
c) 40cm x 40cm x 40cm - 20%	
- 40 cm x 40 cm x 40 cm & 40 cm x 40 cm x 20 cm C.C. BLOCK SHALL BE PLACED AS SHOWN IN THE SECTIONS
- CONCRETE FOR C.C. BLOCK SHALL HAVE MINIMUM COMPRESSIVE STRENGTH OF 30 N/mm² AT 28 DAYS CYLINDER TEST.
- 100 mm THICK SAND FILTER (F.N. 1.0 TO 1.5) SHALL BE PLACED UNDER THE RECOMMENDED GEOTEXTILE FILTER CLOTH OF BWDB STANDARD SCHEDULE ITEM NO. 10-600-00.
- 100 mm THICK WELL GRADED #400 FILTER (40mm TO 20mm & 20mm TO 5mm) SHALL BE PLACED OVER RECOMMENDED GEOTEXTILE FILTER CLOTH AS SHOWN IN SECTIONS.
- EARTH WORK IN FELLING IN CONSTRUCTION (RE-SECTIONING) OF EARTHEN SHANK & BELL MOUTH SHALL BE DONE BY COMPACTED BORROWING EARTH FROM RIVER BED (MENTION AS BWDB STANDARD SCHEDULE ITEM NO. 15-440) FILLING OF 85% STANDARD PROCTOR DENSITY.
- ADEQUATE (MINIMUM-10%) QUANTITY OF STOCK PILE OF HARD MATERIALS (C.C.BLOCK/HARD ROCK) SHALL BE MADE AVAILABLE TO USE DURING EMERGENCY.
- 250KG SAND FILLED GEO-BAGS ABOVE LWL USED DURING EMERGENCY SALVAGED AND REUSED BELOW LWL TO BUILD UP THE SLOPE WHEREVER APPLICABLE.
- AS THIS WORK WILL BE DONE IN PERIOD OF TWO YEARS, ADEQUATE QUANTITY OF 250KG SAND FILLED GEO-BAGS SHOULD BE KEPT RESERVE TO PROTECT THE ON GOING WORK.
- ANY OMISSION / CORRECTION SHALL HAVE TO BE INFORMED IMMEDIATELY TO THE DESIGN OFFICE.
- THE WORK SHOULD BE EXECUTED AFTER OBTAINING ADMINISTRATIVE AND FINANCIAL APPROVAL FROM COMPETENT AUTHORITY.
- THIS DRAWING IS PREPARED AS PER PROPOSAL & DESIGN DATA SUBMITTED BY PROJECT DIRECTOR, CAPITAL PLOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CDRSB), BWDB, DHAKA. VIDE HIS OFFICE MEMO NO. PD/PHU-CDRSB/D-1/707, DATE: 10.09.2013.

BANGLADESH WATER DEVELOPMENT BOARD

**OFFICE OF THE SUPERINTENDING ENGINEER
DESIGN CIRCLE-VI**

PROPOSED PROTECTIVE WORK OF CROSS BAR NO-2 UNDER THE PROJECT "CAPITAL PLOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CDRSB)" AT BRE KM. 165.00 (KHOKSHABARI) IN RAJSHAHI SIRAJGANJ SADAR, DIST. SIRAJGANJ UNDER SIRAJGANJ DIVISION, BWDB, SIRAJGANJ, DURING THE FY. 2013-2014 TO 2014-2015

DESIGNED BY: *[Signature]*
(PROJ. ENGINEER) S. E.

RECOMMENDED BY: *[Signature]*
(S.E. HASAN PARVEZ) S. E.

DRAWN BY: MR. MONIRUL ISLAM

APPROVED BY: *[Signature]*
(S.E. HASAN PARVEZ) S. E.

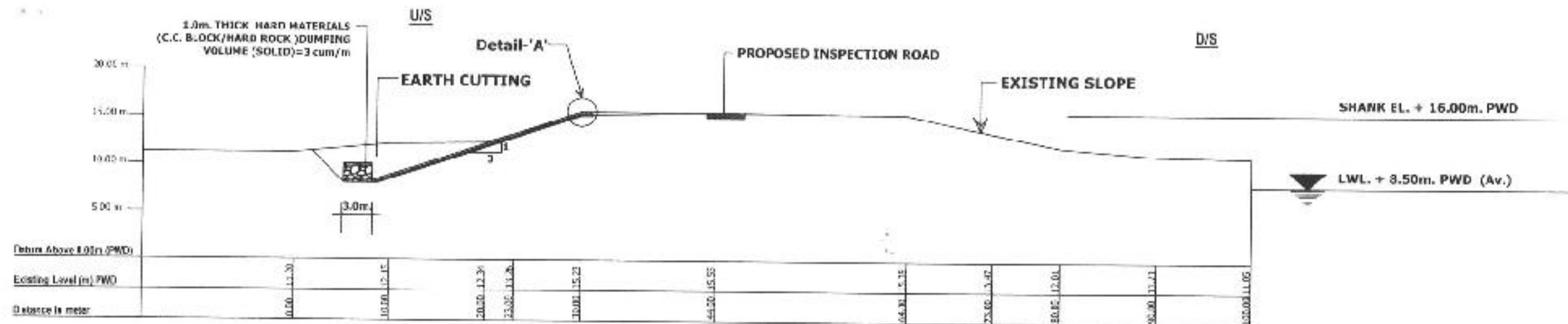
CHECKED BY: *[Signature]*

DATE: 05.12.2013

DATE: 05.12.2013

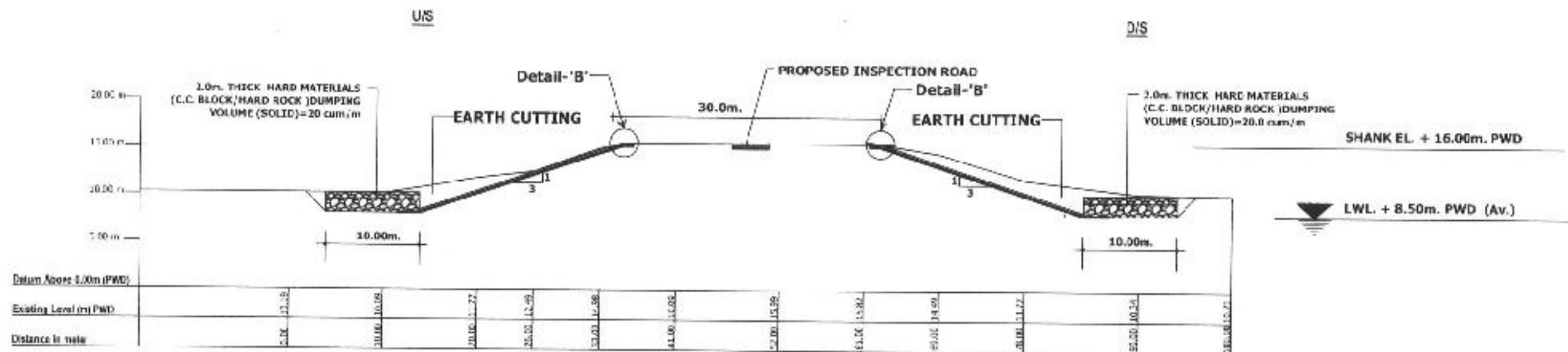
DWG. NO. BWZ/4(B) 7051

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TYPICAL CROSS SECTION OF PROPOSED PROTECTIVE WORK AT M. 540.00 (SEC. 1-1)

SCALE : 1cm. = 100m

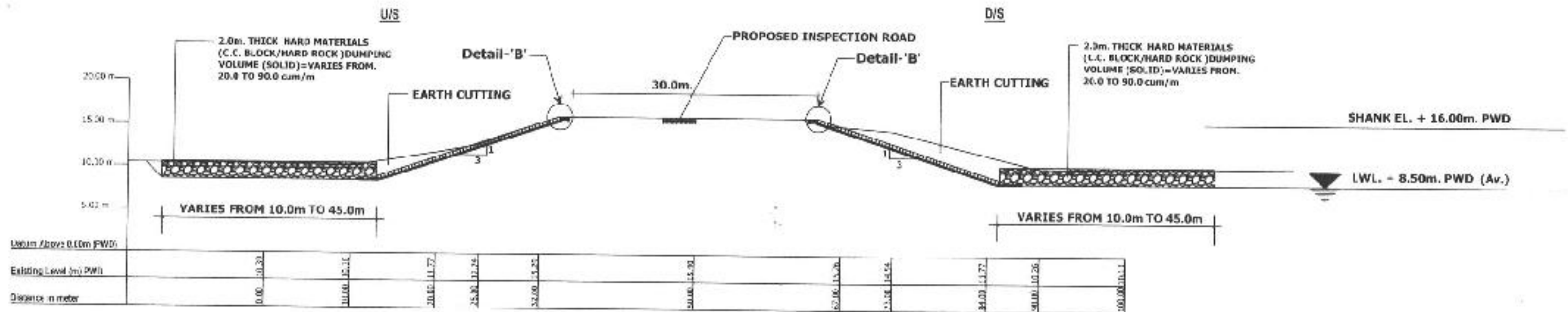


TYPICAL CROSS SECTION OF PROPOSED PROTECTIVE WORK AT M. 940.00 (SEC. 2-2)

SCALE : 1cm. = 100m

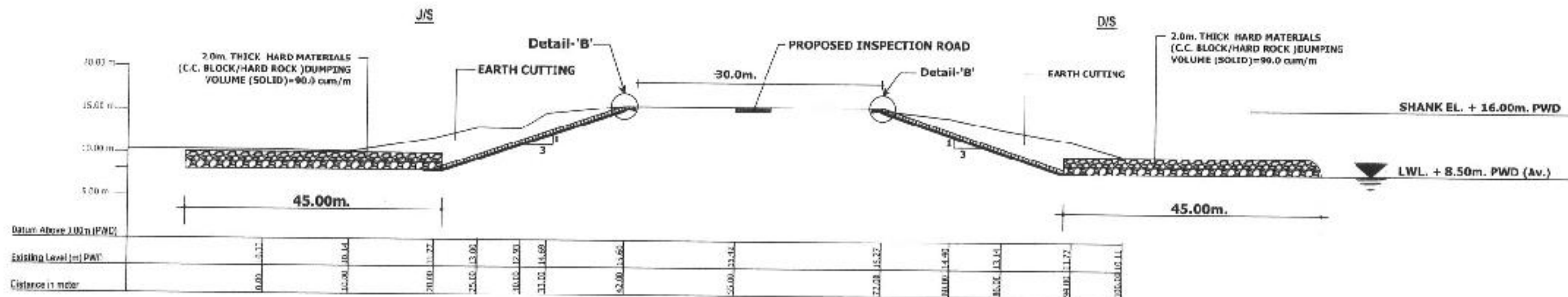
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REVISIONS					

BANGLADESH WATER DEVELOPMENT BOARD	
OFFICE OF THE SUPERINTENDING ENGINEER DESIGN CIRCLE - VI	
PROPOSED PROTECTIVE WORK OF CROSS BAR NO-2 UNDER THE PROJECT "CAPITAL PILOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CDRSB)" AT BRE KM.165.00 (KHOKSHABARI) IN JPAZILLA SIRAJGANJ SADAR, DIST. SIRAJGANJ UNDER SIRAJGANJ O&M DIVISION, BWCB, SIRAJGANJ DURING THE FY. 2013-2014 TO 2014-2015.	
DESIGNED : <i>Farzana</i> (FARZANA AFREEN) S.D.E.	REVIEWED : <i>Hasan</i> (MD. HASAN PARVEZ) S.E.
DRAWN : MD. MONIRUL ISLAM	APPROVED : <i>Jati Das Kundu</i> (JATI DAS KUNDU) CHIEF ENGINEER, DESIGN.
CHECKED : <i>Motaher Hossain</i> (MOTAHER HOSSAIN) E.E.	DATE : 03.12.2013
	DWG. NO. NW2/4(B)-7032



TYPICAL CROSS SECTION OF PROPOSED PROTECTIVE WORK AT M. 1065.00 (SEC. 3-3)

SCALE : 1cm. = 100m.

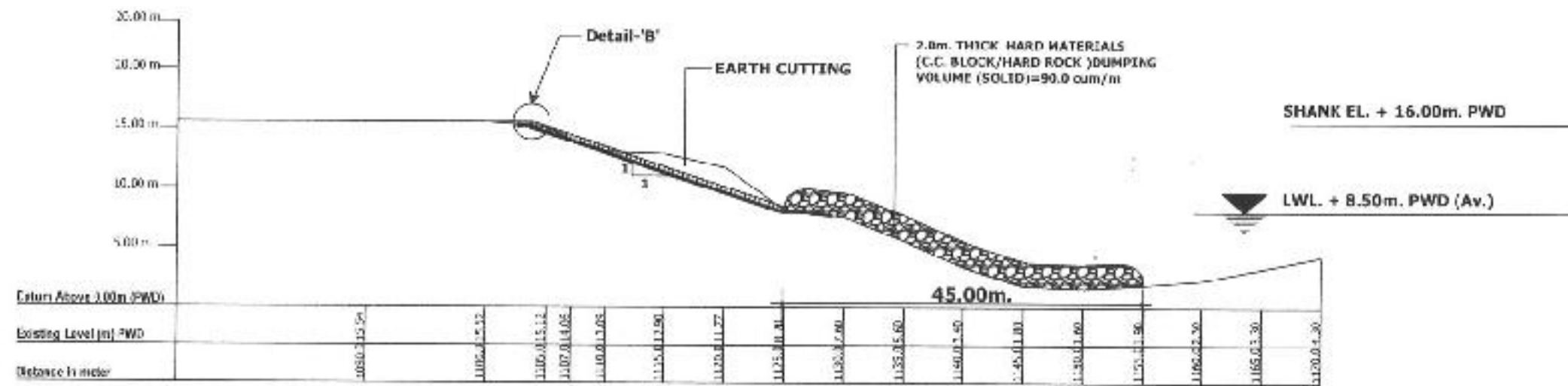


TYPICAL CROSS SECTION OF PROPOSED PROTECTIVE WORK AT M. 1090.00 (SEC. 4-4)

SCALE : 1cm. = 100m.

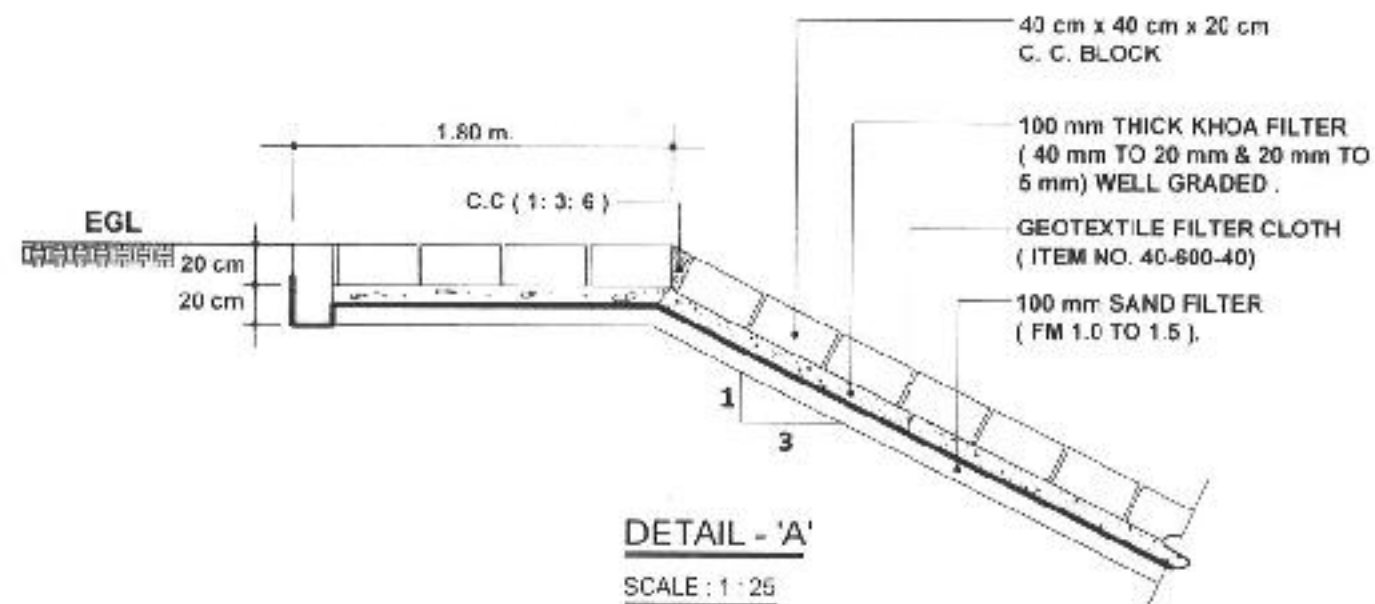
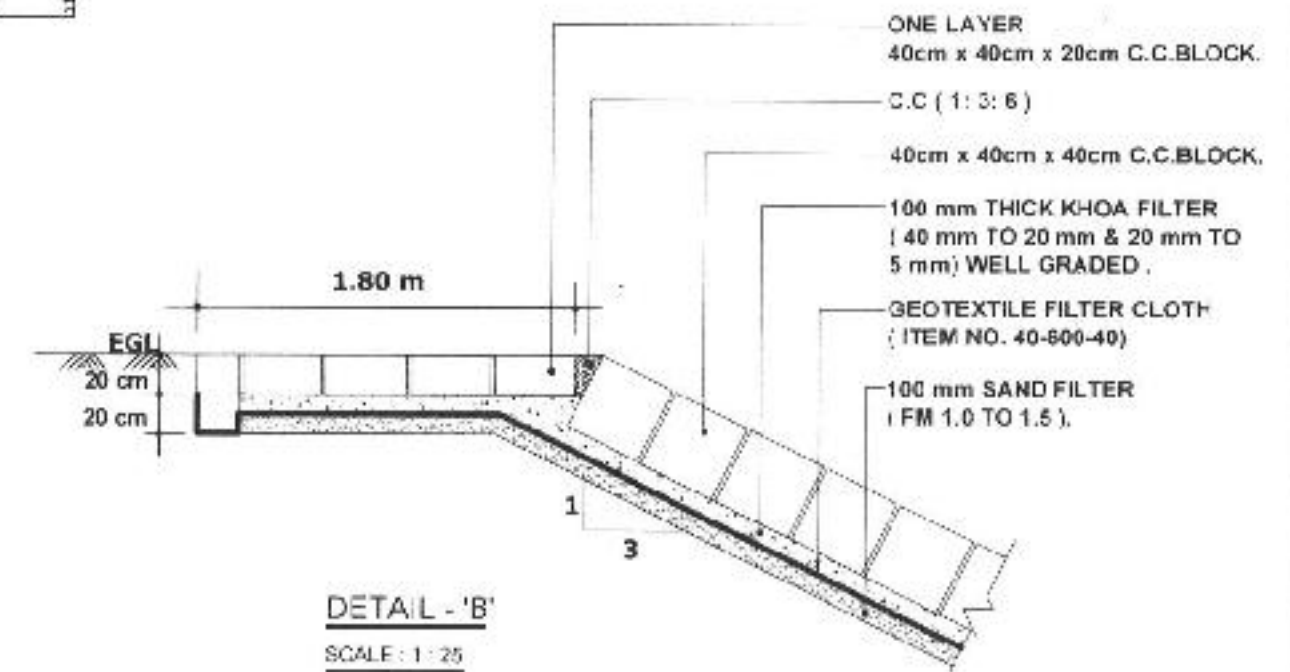
NO.	DATE	MADE	CHECKED	REVISION	APPROVED
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REVISIONS					

BANGLADESH WATER DEVELOPMENT BOARD	
OFFICE OF THE SUPERINTENDING ENGINEER DESIGN CIRCLE - VI	
PROPOSED PROTECTIVE WORK OF CROSS BAR NO-2 UNDER THE PROJECT "CAPITAL PILOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CDRSB)" AT BRE KM.165.00 (KHOKSHABARI) IN UPAZILLA SIRAJGANJ SADAR, DIST. SIRAJGANJ UNDER SIRAJGANJ O&M DIVISION, BWDB, SIRAJGANJ DURING THE FY. 2013-2014 TO 2014-2015.	
DESIGNED : <i>Farzana</i> (FARZANA AFREEN) S.D.E.	RECOMMENDED : <i>Hasan</i> (HMD. HASAN FARVEZ) S.E.
DRAWN : MD. NONIRUL ISLAM	APPROVED : <i>Jati Das Kundu</i> (JATI DAS KUNDU) S.E.
CHECKED : <i>Motaher Hossain</i> (MOTAHER HOSSAIN) E.E.	CHIEF ENGINEER, DESIGN
DATE : 03.12.2013	DWG. NO. : NW2/4(B)- 7033



TYPICAL CROSS SECTION OF PROPOSED PROTECTIVE WORK AT M. 1090.00 (SEC. 5-5)

SCALE : 1cm = 100m



BANGLADESH WATER DEVELOPMENT BOARD

**OFFICE OF THE SUPERINTENDING ENGINEER
DESIGN CIRCLE - VI**

PROPOSED PROTECTIVE WORK OF CROSS BAR NO-2 UNDER THE PROJECT "CAPITAL PILOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CDRSB)" AT BRE KM.165.00 (KHOKSHABARI) IN UPAZILLA SIRAJGANJ SADAR, DIST. SIRAJGANJ UNDER SIRAJGANJ O&M DIVISION, BWDB, SIRAJGANJ DURING THE FY. 2013-2014 TO 2014-2015.

DESIGNED : *Farzana Afreen*
(FARZANA AFREEN) S.D.E.

RECOMMENDED

DRAWN : MD. MONIRUL ISLAM

Hasan Parvez
(MD. HASAN PARVEZ) S.E.

TRACED :

APPROVED

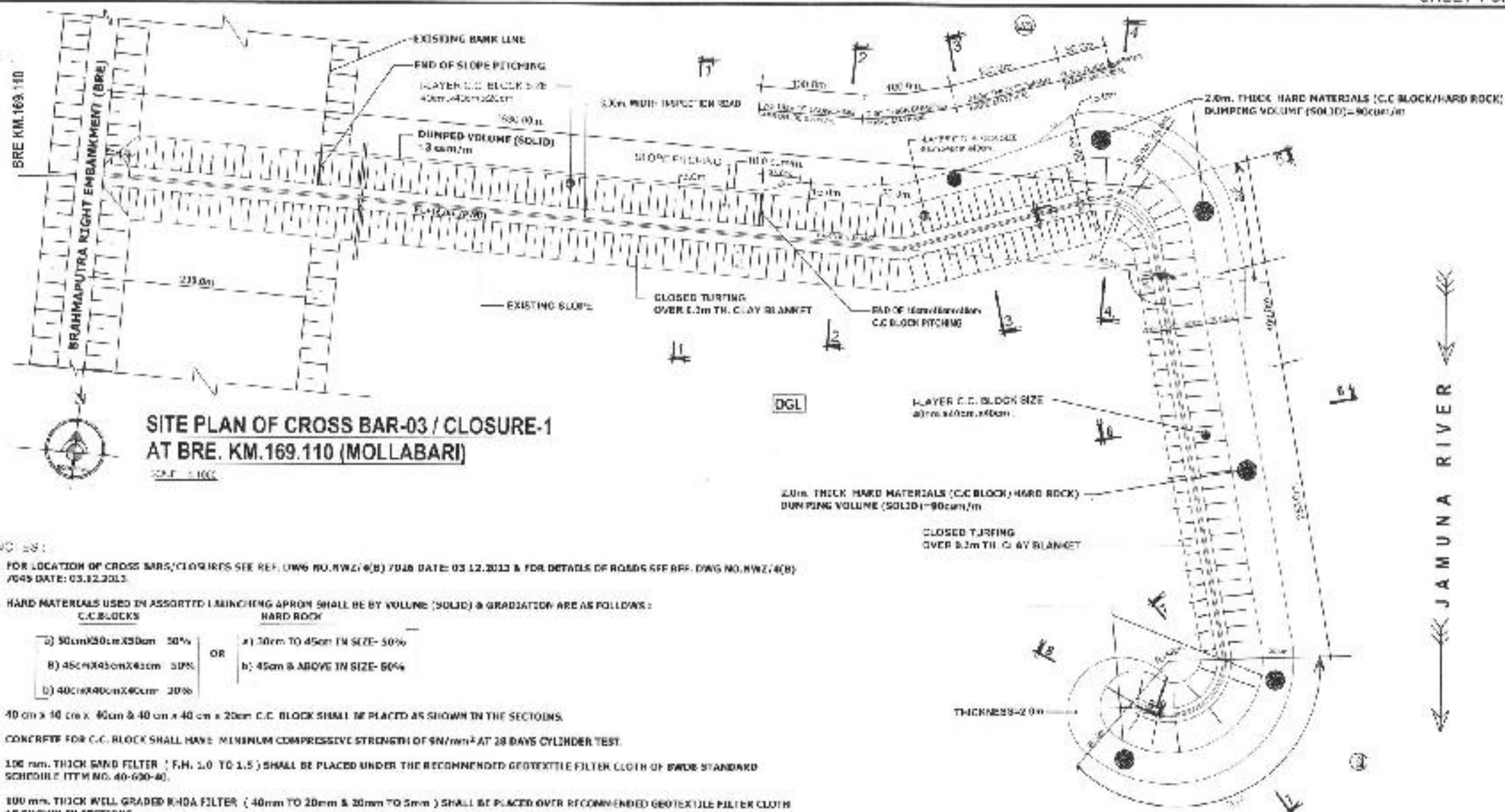
CHECKED : *Motaher Hussain*
(MOTAHER HUSSAIN) E.E.

Jati Das Kundu
(JATI DAS KUNDU)
CHIEF ENGINEER, DESIGN

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NO.	DATE	MADE	CHECKED	RECOMMENDED	APPROVED
REVISIONS					

DATE 03.12.2013

DWG. NO. NW2/4(B)-7334



**SITE PLAN OF CROSS BAR-03 / CLOSURE-1
AT BRE. KM.169.110 (MOLLABARI)**

SCALE: 1:1000

NOTES:

- FOR LOCATION OF CROSS BARS/CLOSURES SEE REF. UWS NO. RWZ/4(B) /JAB DATE: 03.12.2013 & FOR DETAILS OF ROADS SEE REF. DWG NO. RWZ/4(B) /JAB DATE: 03.12.2013.
- HARD MATERIALS USED IN ASSORTED LAMINATING APRON SHALL BE BY VOLUME (SOLID) & GRADATION ARE AS FOLLOWS:
C.C. BLOCKS
a) 30cm x 30cm x 20cm - 50%
b) 45cm x 45cm x 40cm - 50%
c) 40cm x 40cm x 40cm - 20%
OR
HARD ROCK
a) 30cm TO 45cm IN SIZE - 50%
b) 45cm & ABOVE IN SIZE - 50%
- 40 cm x 40 cm x 40 cm & 40 cm x 40 cm x 20 cm C.C. BLOCK SHALL BE PLACED AS SHOWN IN THE SECTIONS.
- CONCRETE FOR C.C. BLOCK SHALL HAVE MINIMUM COMPRESSIVE STRENGTH OF 50 N/mm² AT 28 DAYS CYLINDER TEST.
- 100 mm. THICK SAND FILTER (F.H. 1.0 TO 1.5) SHALL BE PLACED UNDER THE RECOMMENDED GEOTEXTILE FILTER CLOTH OF BURE STANDARD SCHEDULE ITT M NO. 40-630-40.
- 100 mm. THICK WELL GRADED R.H.D.A FILTER (40mm TO 20mm & 20mm TO 5mm) SHALL BE PLACED OVER RECOMMENDED GEOTEXTILE FILTER CLOTH AS SHOWN IN SECTIONS.
- EARTH WORK IN FILLING OR CONSTRUCTION (RE-SECTIONING) OF EARTHEN SHANK & BELL MOUTH SHALL BE DONE BY COMPACTED BORROWING EARTH FROM RIVER BED (MENTION AS B.W.D. STANDARD SCHEDULE ITEM NO. LB-440) FILLING OF 85% STANDARD PROCTOR DENSITY.
- ADEQUATE (MINIMUM-10%) QUANTITY OF STOCK PILE OF HARD MATERIALS (C.C.BLOCK/HARD ROCK) SHALL BE MADE AVAILABLE TO USE DURING EMERGENCY.
- 250KG SAND FILLED GEO-BAGS ABOVE LWL USED DURING EMERGENCY SALVAGED AND REUSED BELOW LWL TO BUILD UP THE SLOPE WHENEVER APPLICABLE.
- AS THIS WORK WILL BE DONE IN PERIOD OF TWO YEARS, ADEQUATE QUANTITY OF 150KG SAND FILLED GEO-BAGS SHOULD BE KEPT RESERVE TO PROTECT THE ON GOING WORK.
- ANY OMISSION / CORRECTION SHALL HAVE TO BE INFORMED IMMEDIATELY TO THE DESIGN OFFICE.
- THE WORK SHOULD BE EXECUTED AFTER OBTAINING ADMINISTRATIVE AND FINANCIAL APPROVAL FROM COMPETENT AUTHORITY.
- THIS DRAWING IS PREPARED AS PER PROPOSAL & DESIGN DATA SUBMITTED BY PROJECT DIRECTOR, CAPITAL PILOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CORSB), DMDR, DHAKA. VIDE HIS OFFICE MEMO NO. PD/PRU-COR35/D-1/707. DATE: 10.09.2013.

BANGLADESH WATER DEVELOPMENT BOARD

OFFICE OF THE SUPERINTENDING ENGINEER
DESIGN CIRCLE - VI

PROPOSED PROTECTIVE WORK OF CROSS BAR NO-3 CLOSURE-1 IN CONNECTION WITH THE PROJECT "CAPITAL PILOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CORSB)" AT BRE KM.169.110 IN PAZILLA & BRAJGANJ SADAR, D. ST. BRAJGANJ UNDER BRAJGANJ USM DIVISION, EWDB, BRAJGANJ DURING THE FY 2013-2014 TO 2014-2015.

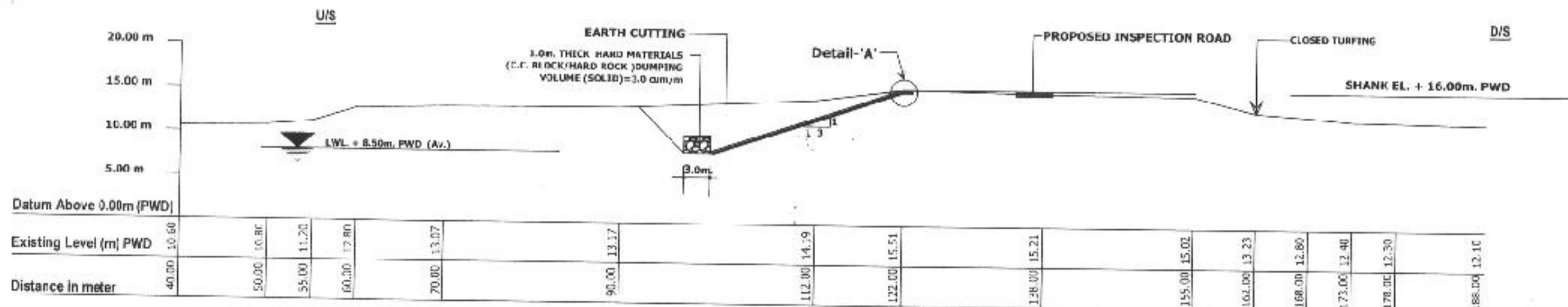
DESIGNED: *Farzana Akter*
(FARZANA AKTER), S.E.
DRAWN: MD. MOHAMMAD ISLAM
CHECKED: *Motaher Hossain*
(MOTAHER HOSSAIN), E.E.

REVIEWED: *MD. HASAN PARVEZ*
(MD. HASAN PARVEZ), S.E.
APPROVED: *MD. HASAN PARVEZ*
(MD. HASAN PARVEZ), S.E.
CHIEF ENGINEER, DESIGN.

NO.	DATE	USER	CHANGED	BY	REASON
1	08.12.2013				

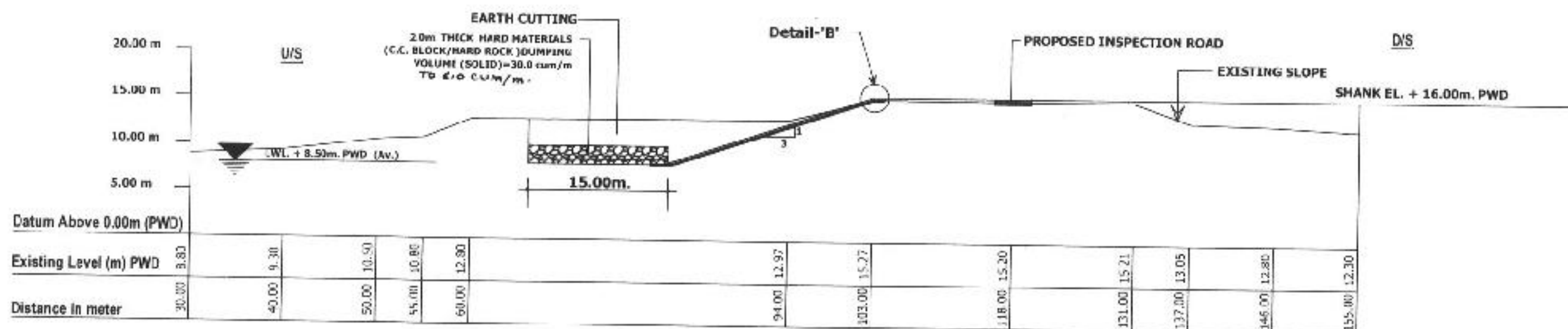
DATE: 08.12.2013

DWG. NO. RWZ/4(B) /JAB



TYPICAL CROSS SECTION OF PROPOSED PROTECTIVE WORK AT M. 890.0 (SEC. 1-1)

SCALE : 1cm. = 100m.

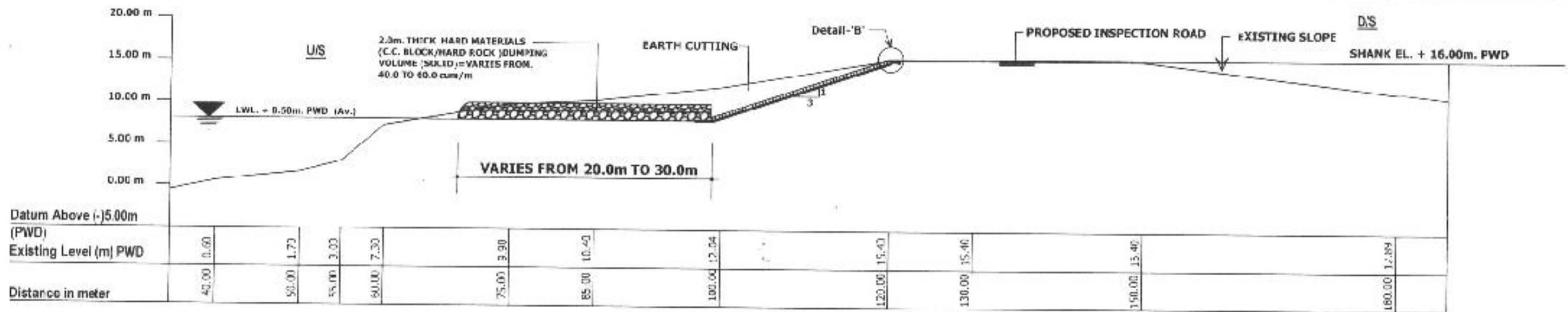


TYPICAL CROSS SECTION OF PROPOSED PROTECTIVE WORK AT M. 1390.0 (SEC. 2-2)

SCALE : 1cm. = 100m.

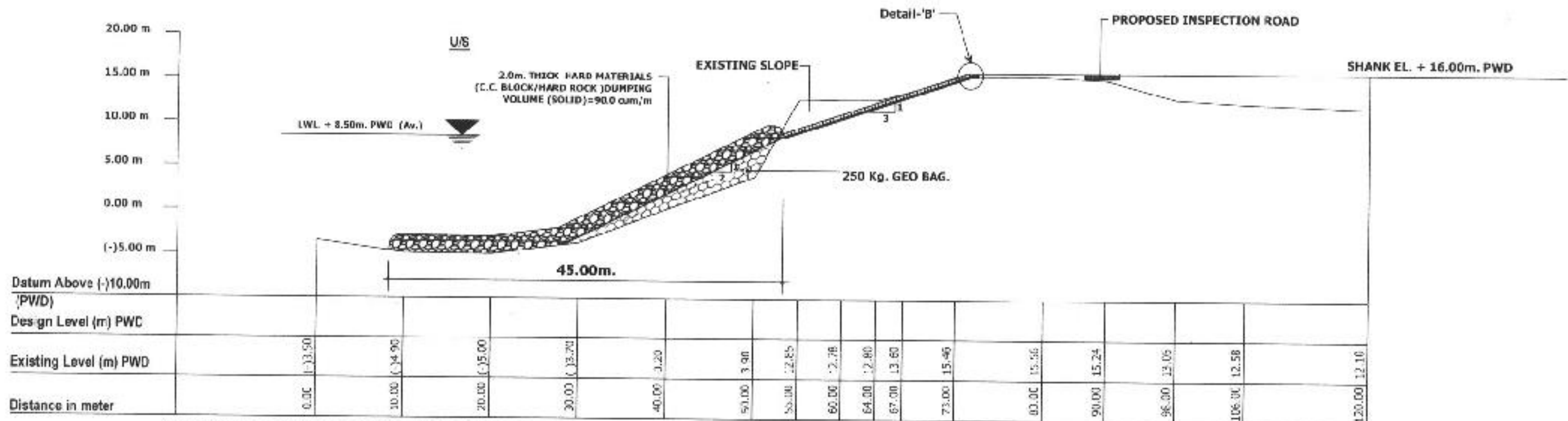
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BANGLADESH WATER DEVELOPMENT BOARD	
OFFICE OF THE SUPERINTENDING ENGINEER DESIGN CIRCLE - VI	
PROPOSED PROTECTIVE WORK OF CROSS BAR NO-3 / CLOSURE-1 IN CONNECTION WITH THE PROJECT "CAPITAL PILOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CORSB)" AT BRE KM.169.110 IN UPAZILLA SIRAJGANJ SADAR, DIST. SIRAJGANJ UNDER SIRAJGANJ O&M DIVISION, BWDB, SIRAJGANJ DURING THE FY. 2013-2014 TO 2014-2015.	
DESIGNED : <i>Farzana</i> (FARZANA AFRIN) S.D.E.	RECOMMENDED : <i>MD. HASAN PARVEZ</i> (MD. HASAN PARVEZ) S.E.
DRAWN : MD. MONIRUL ISLAM	APPROVED : <i>DAI DAS KUNDU</i> (DAI DAS KUNDU) CHIEF ENGINEER, DES. DIV.
CHECKED : <i>Motaher Hossain</i> (MOTAHER HOSSAIN) E.E.	DATE : 03.12.2013
DWG. NO. NW2/4(B)-7036	



TYPICAL CROSS SECTION OF PROPOSED PROTECTIVE WORK AT M. 1490.0 (SEC. 3-3)

SCALE : 1cm. = 100m.



TYPICAL CROSS SECTION OF PROPOSED PROTECTIVE WORK AT M. 1630.0 (SEC. 4-4)

SCALE : 1cm. = 100m.

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BANGLADESH WATER DEVELOPMENT BOARD

**OFFICE OF THE SUPERINTENDING ENGINEER
DESIGN CIRCLE - VI**

PROPOSED PROTECTIVE WORK OF CROSS BAR NO-3 (CLOSURE-1) IN CONNECTION WITH THE PROJECT "CAPITAL PILOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CDRSB)" AT BRE KM.169.110 IN UPAZILLA SIRAJGANJ SADAR, DIST. SIRAJGANJ UNDER SIRAJGANJ O&M DIVISION, BWDB, SIRAJGANJ DURING THE FY. 2013-2014 TO 2014-2015.

DESIGNED : *Fahreen*
(FAHREANA APREEN) S.D.E.

RECOMMENDED :

DRAWN : MD. MUNIRUL ISLAM

(MD. HASAN PARVEZ) S.E.

TRACED :

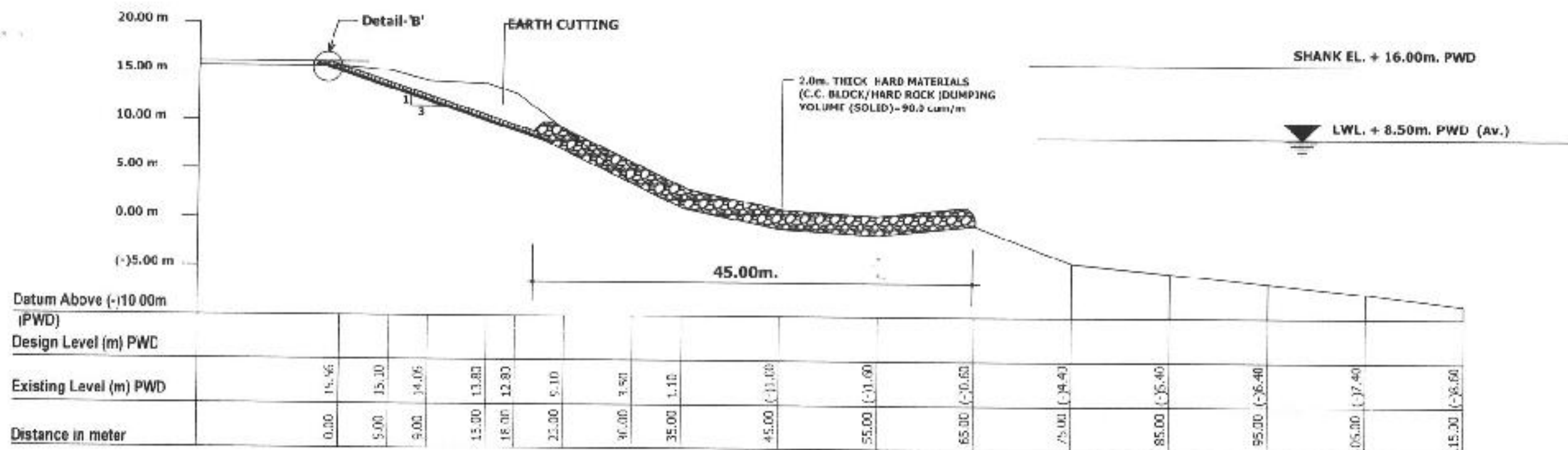
APPROVED :

CHECKED : *Motaher*
(MOTAHER HOSSAIN) E.E.

Jati Das Kundu
(JATI DAS KUNDU)
CHIEF ENGINEER, DESIGN

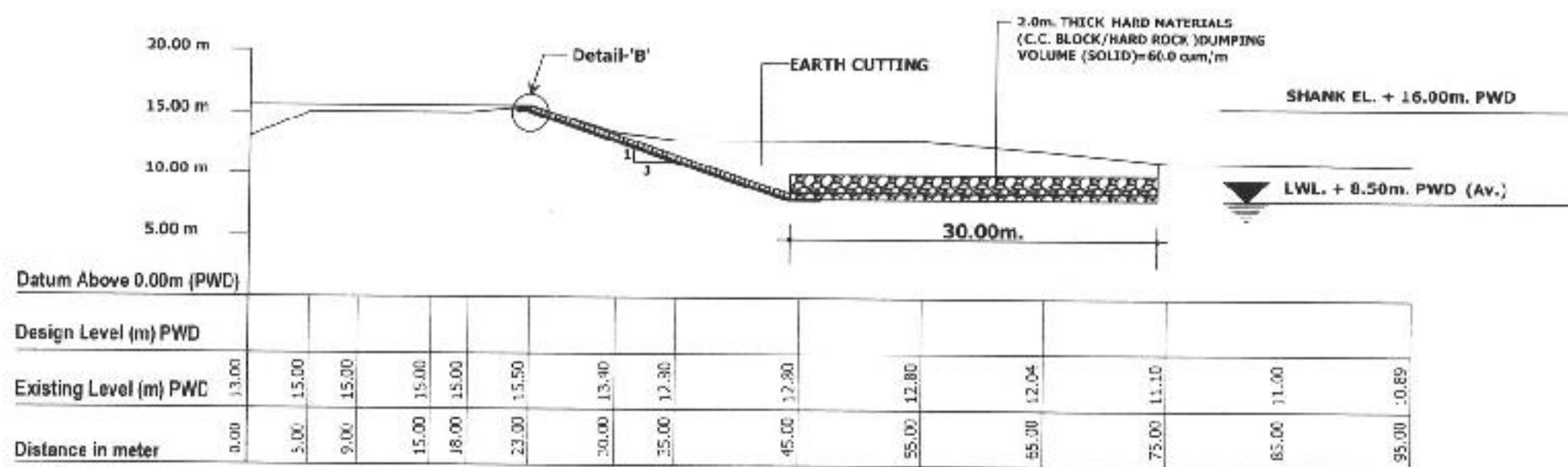
DATE : 03.12.2013

DWG. NO. NW2/4(B)-7037



TYPICAL CROSS SECTION OF PROPOSED PROTECTIVE WORK AT M. 1630.0 (SEC. 5-5) (C/L OF THE CROSS BAR)

SCALE 1cm. = 100m.

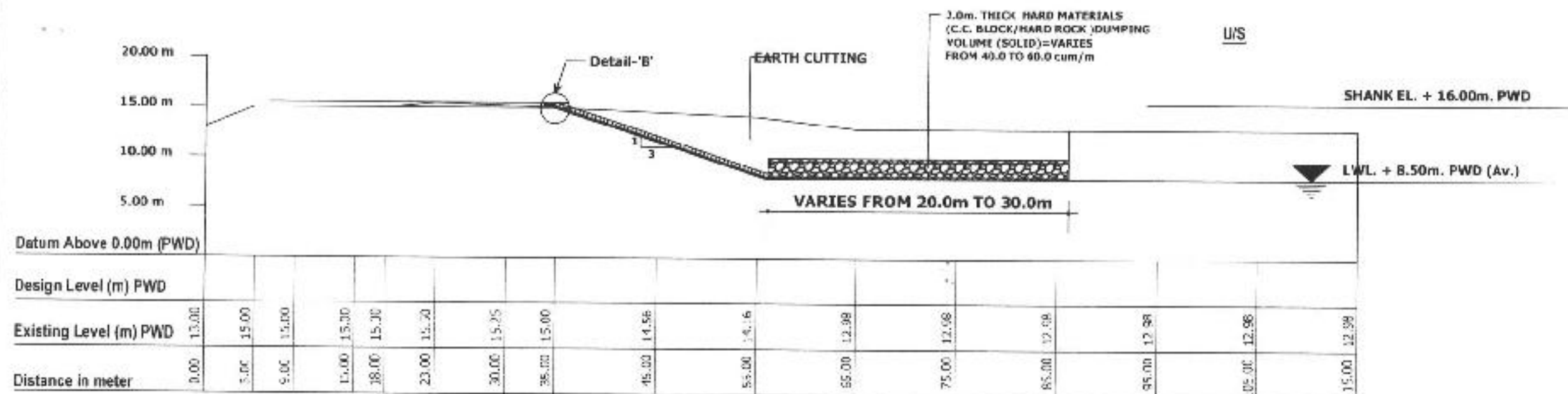


TYPICAL CROSS SECTION OF PROPOSED PROTECTIVE WORK AT M. 2030.0 (SEC. 6-6)

SCALE 1cm. = 100m.

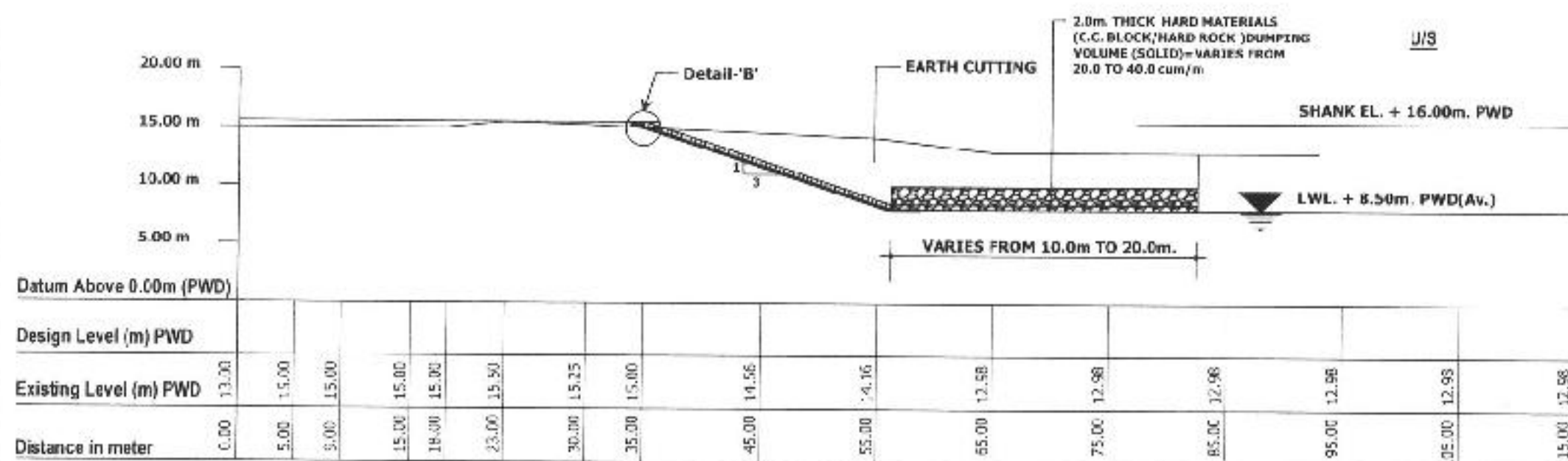
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BANGLADESH WATER DEVELOPMENT BOARD	
OFFICE OF THE SUPERINTENDING ENGINEER DESIGN CIRCLE - VI	
PROPOSED PROTECTIVE WORK OF CROSS BAR NO-3 (CLOSURE-1 IN CONNECTION WITH THE PROJECT "CAPITAL PILOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CDRSB)" AT BRE KM.169.110 IN UPAZILLA SIRAJGANJ SADAR, DIST. SIRAJGANJ UNDER SIRAJGANJ O&M DIVISION, BWDB, SIRAJGANJ DURING THE FY. 2013-2014 TO 2014-2015.	
DESIGNED : <i>Farzana</i> (FARZANA AFREEN) S.D.E.	RECOMMENDED : <i>Hasan</i> (MD. HASAN PARVEZ) S.E.
DRAWN : MD. MONIRUL ISLAM	APPROVED : <i>Jati Das Kundu</i> (JATI DAS KUNDU) CHIEF ENGINEER, DESIGN.
TRACED : <i>Motaher Hossain</i> (MOTAHER HOSSAIN) E.E.	DATE : 03.12.2013
CHECKED : <i>Motaher Hossain</i> (MOTAHER HOSSAIN) E.E.	DWG. NO. : NWZ/4(B)-7038



TYPICAL CROSS SECTION OF PROPOSED PROTECTIVE WORK AT M. 2130.0 (SEC. 7-7)

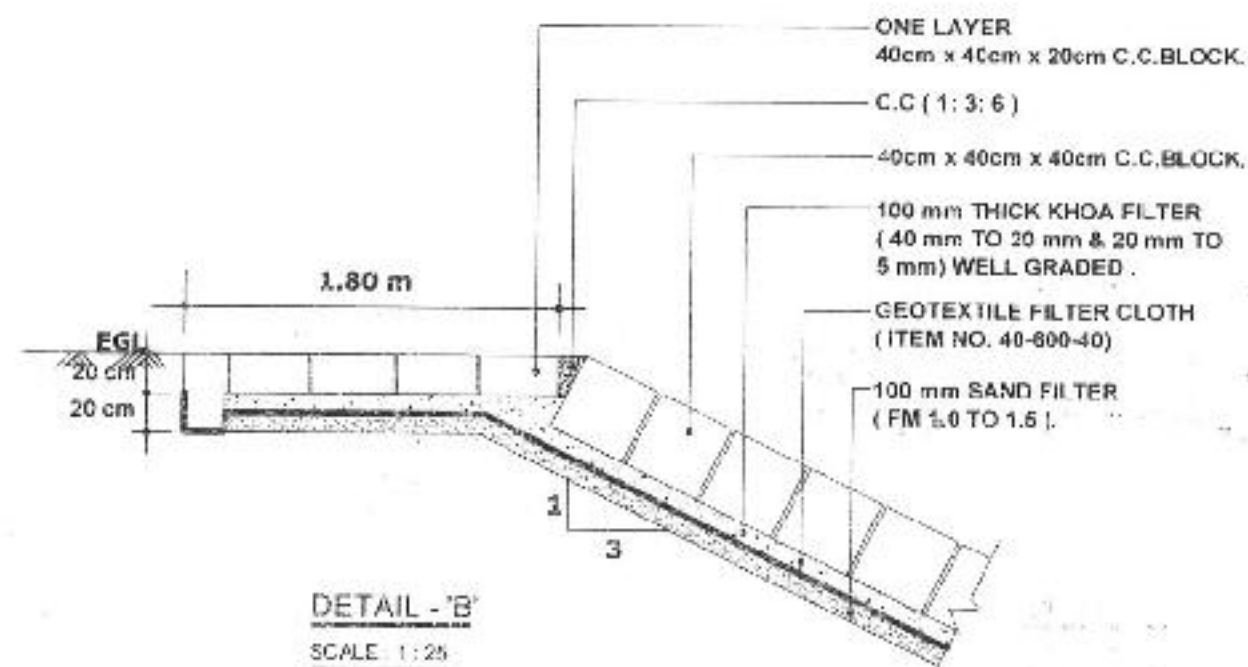
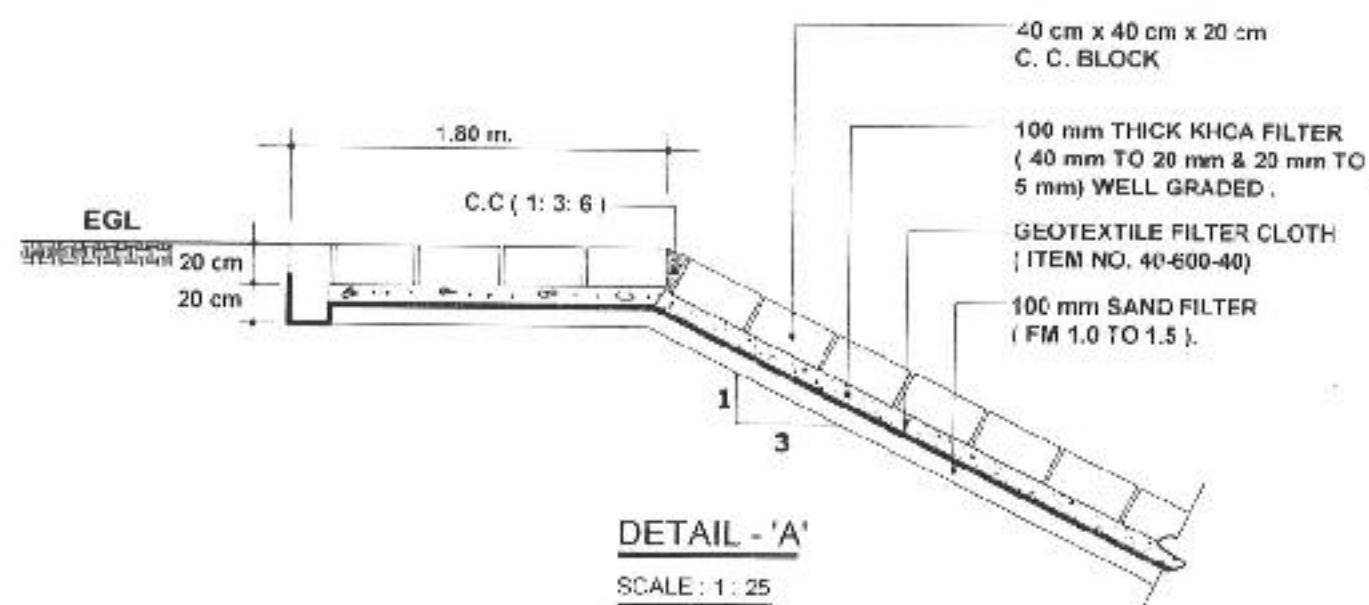
SCALE : 1cm = 100m



TYPICAL CROSS SECTION OF PROPOSED PROTECTIVE WORK AT M. 2130.0 (SEC. 8-8)

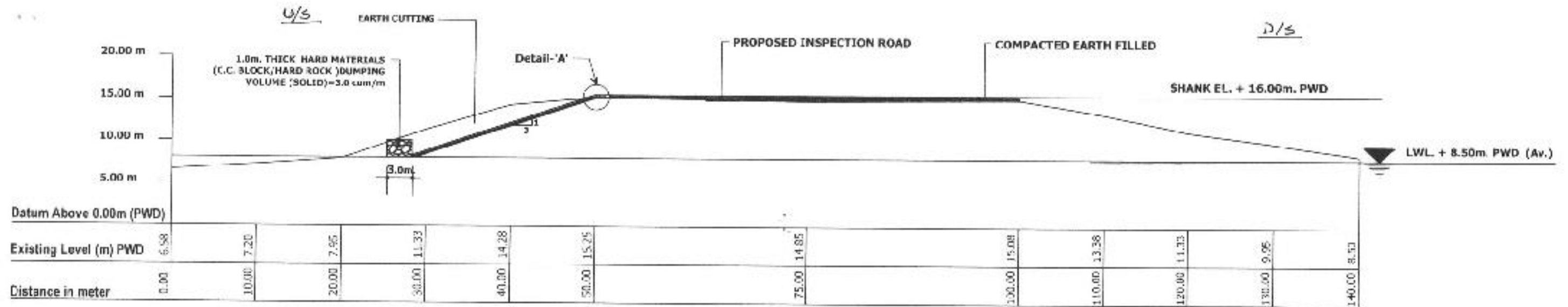
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BANGLADESH WATER DEVELOPMENT BOARD	
OFFICE OF THE SUPERINTENDING ENGINEER DESIGN CIRCLE - VI	
PROPOSED PROTECTIVE WORK OF CROSS BAR NO-3 /CLOSURE-1 IN CONNECTION WITH THE PROJECT "CAPITAL PILOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CDRSB)" AT BRE KM.169.110 IN UPAZILLA SIRAJGANJ SADAR, DIST. SIRAJGANJ UNDER SIRAJGANJ O&M DIVISION, BWDB, SIRAJGANJ DURING THE FY. 2013-2014 TO 2014-2015.	
DESIGNED : <i>Farzana</i> (FARZANA AFREEN) S.D.E.	RECOMMENDED : <i>MD. HASAN PARVEZ</i> S.E.
DRAWN : MD. MONIRUL ISLAM	APPROVED : <i>Jati Das Kundu</i> (JATI DAS KUNDU) CHIEF ENGINEER, DESIGN.
CHECKED : <i>Motaher Hossain</i> (MOTAHER HOSSAIN) E.E.	DATE : 03.12.2013
DWG. NO. : NW2/4(B)-7039	



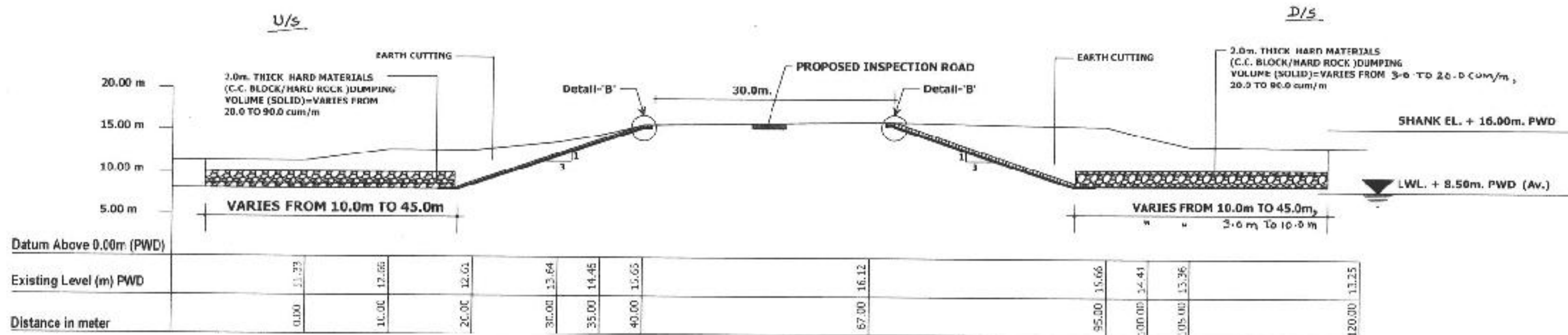
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BANGLADESH WATER DEVELOPMENT BOARD	
OFFICE OF THE SUPERINTENDING ENGINEER DESIGN CIRCLE - VI	
PROPOSED PROTECTIVE WORK OF CROSS BAR NO-3/CLOSURE-1 IN CONNECTION WITH THE PROJECT "CAPITAL PILOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CDRSE)" AT BRE KM.169.110 IN UPAZILLA SIRAJGANJ SADAR, DIST. SIRAJGANJ UNDER SIRAJGANJ O&M DIVISION, RWDB, SIRAJGANJ DURING THE FY. 2013-2014 TO 2014-2015.	
DESIGNED: <i>E. A. Rahman</i> (FAZLANA AFSHAN) S.D.E.	RECOMMENDED: <i>(Signature)</i> IND. HASAN PARVEZ) S.F.
DRAWN: MD. MONIRUL ISLAM	APPROVED: <i>(Signature)</i> 3.12.13 (JATI DAS KUNDU) CHIEF ENGINEER, DESIGN,
TRACED: <i>Motaher Hussain</i> (MOTAHAR HUSSAIN) E.E.	
CHECKED: <i>(Signature)</i>	
DATE: 03.12.2013	DWG. NO. NW2/4(B)-7040



TYPICAL CROSS SECTION OF PROPOSED PROTECTIVE WORK AT M. 600.0 (SEC. 1-1)

SCALE: 1cm. = 100m



TYPICAL CROSS SECTION OF PROPOSED PROTECTIVE WORK AT M. 1050.0 (SEC. 2-2)

SCALE: 1cm. = 100m

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REVISIONS

BANGLADESH WATER DEVELOPMENT BOARD

OFFICE OF THE SUPERINTENDING ENGINEER
DESIGN CIRCLE - VI

PROPOSED PROTECTIVE WORK OF CROSS BAR NO-4 IN CONNECTION WITH THE PROJECT "CAPITAL PILOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CDRSB)" AT BRE KM.175.00 (BAWOITARA) IN UPAZILLA SIRAJGANJ SADAR, DIST. SIRAJGANJ UNDER SIRAJGANJ O&M DIVISION, BWDB, SIRAJGANJ DURING THE FY. 2013-2014 TO 2014-2015.

DESIGNED: *Farzana*
(FARZANA AFREEN) S.D.E.

RECOMMENDED:

DRAWN: MD. MONIRUL ISLAM

(MD. HASAN PARVEZ) S.E.

TRACED:

APPROVED:

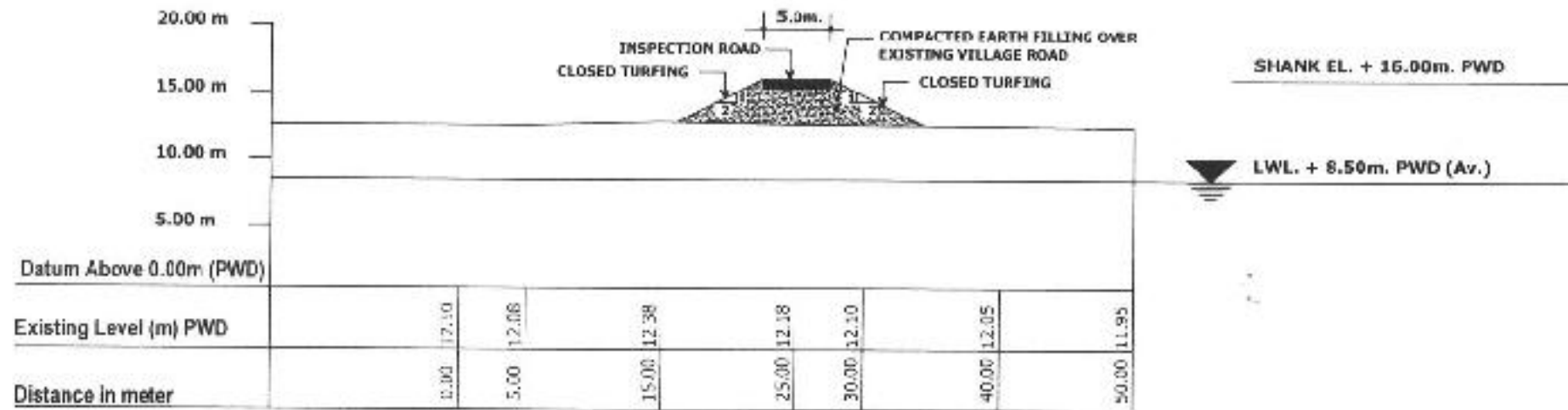
CHECKED:

Motaher
(MOTAHER HOSSAIN) E.E.*Jati Das Kundu*
(JATI DAS KUNDU)
3.12.13
CHIEF ENGINEER, DESIGN

DATE 03.12.2013

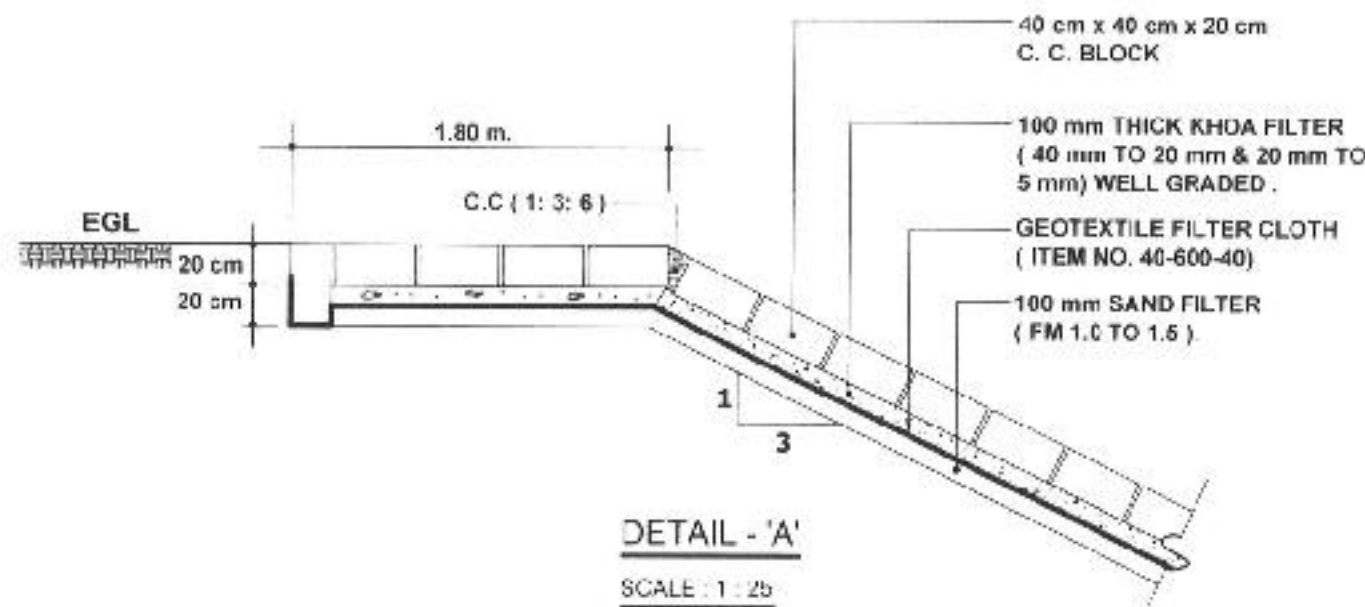
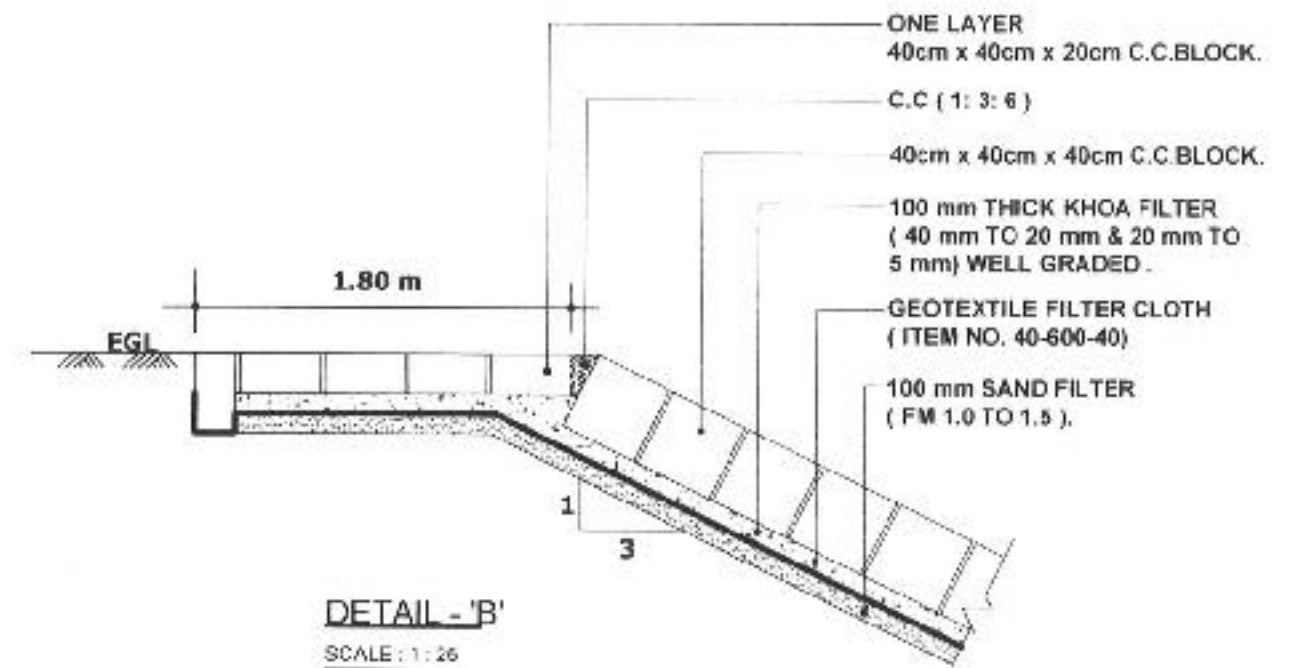
DWS. NO. NW2/4(B)-7042





TYPICAL CROSS SECTION OF PROPOSED CUNNECTING EMBANKMENT/INSPECTION ROAD WITH BRE (SEC. 5-5) (OVER EXISTING VILLAGE ROAD)

SCALE : 1cm. = 100m.



BANGLADESH WATER DEVELOPMENT BOARD

**OFFICE OF THE SUPERINTENDING ENGINEER
DESIGN CIRCLE - VI**

PROPOSED PROTECTIVE WORK OF CROSS BAR NO-4 IN CONNECTION WITH THE PROJECT "CAPITAL PILOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CDRSB)" AT BRE KM.175.00 (BAWOITARA) IN UPAZILLA SIRAJGANJ SADAR, DIST. SIRAJGANJ UNDER SIRAJGANJ O&M DIVISION, BWDB, SIRAJGANJ DURING THE FY. 2013-2014 TO 2014-2015.

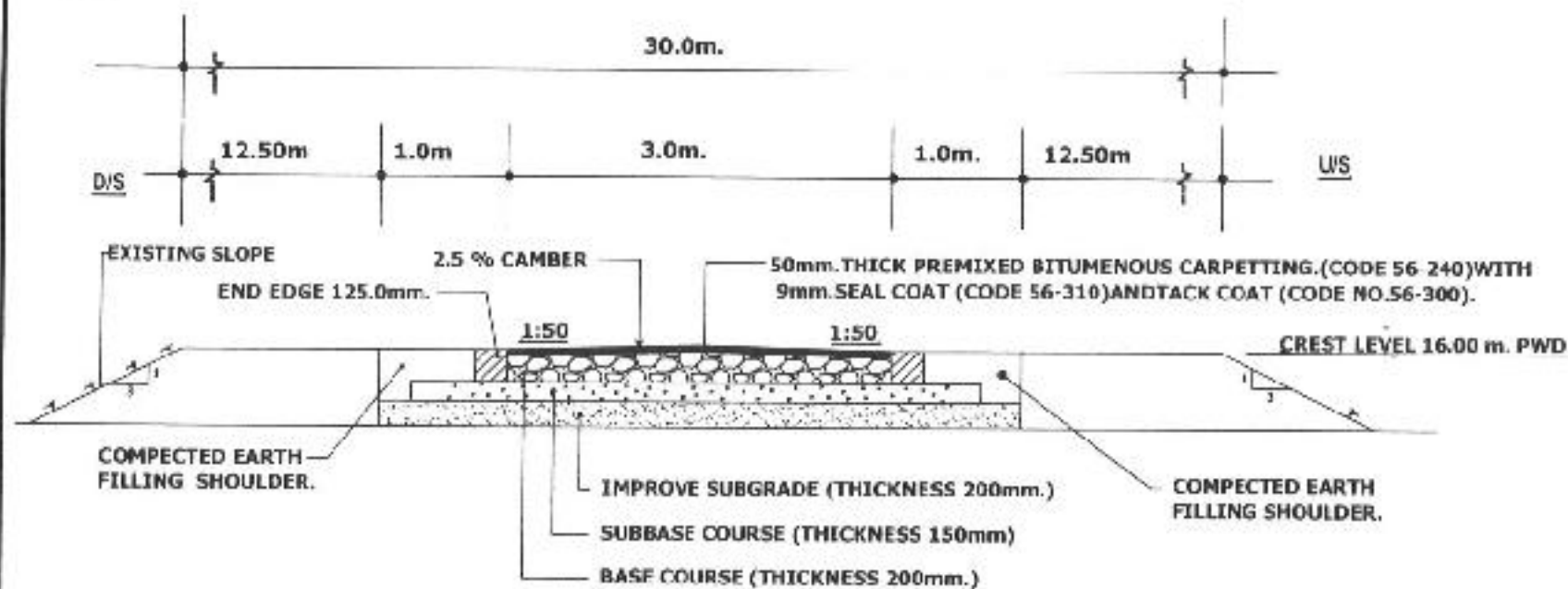
DESIGNED : *Farzana Afreen*
(FARZANA AFREEN) S.D.E.
DRAWN : MD. MOVIJUL ISLAM
TRACED :
CHECKED : *Motaher Hossain*
(MOTAHER HOSSAIN) E.E.

RECOMMENDED : *MD. HASAN PARVEZ*
(MD. HASAN PARVEZ) S.E.
APPROVED : *Jati Das Kundu*
(JATI DAS KUNDU)
CHIEF ENGINEER, DESIGN

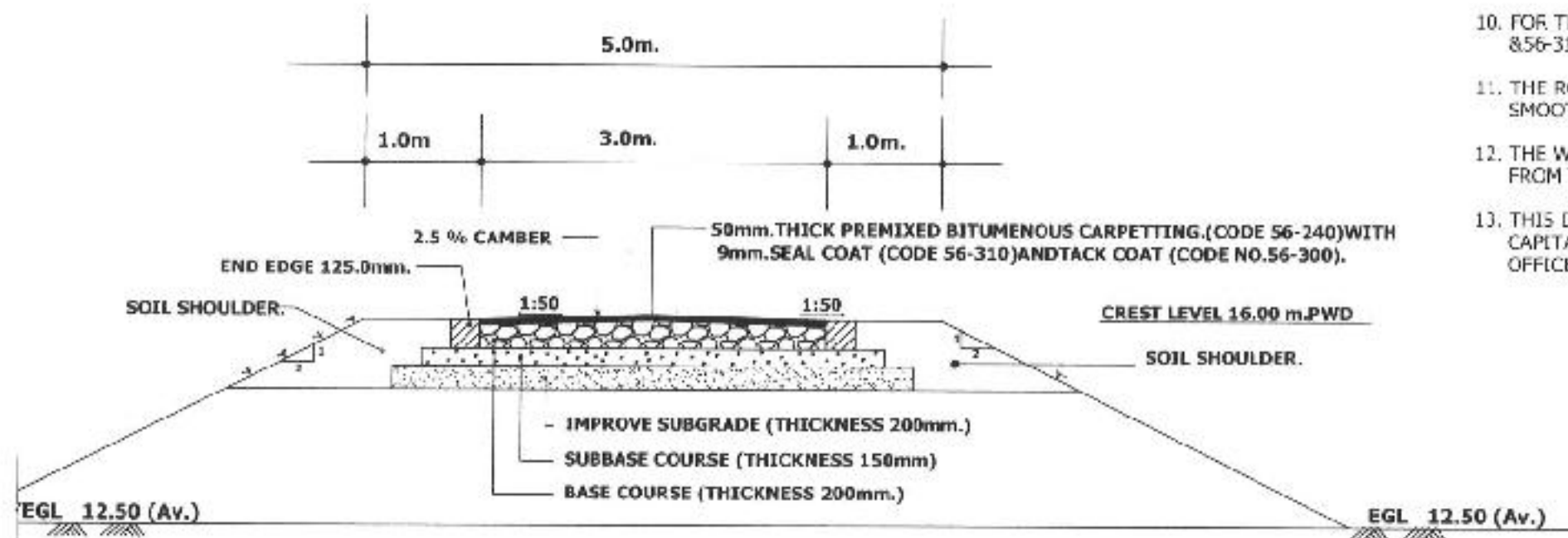
NO.	DATE	WADE	CHENG	REC'D	APPROV.
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ON	DATE	WADE	CHENG	REC'D	APPROV.
REVISIONS					

DATE 03.12.2013

DWG. NO. NW/2/4(R)-7044



**TYPICAL CROSS SECTION OF INSPECTION ROAD OVER 4-NOS CROSS BAR/CLOSURE AT BRE
162.50, KM.165.00, KM.169.110 & KM.175.00.**



**TYPICAL CROSS SECTION OF INSPECTION ROAD OVER EXISTING VILLAGE ROAD
FROM EXISTING BRE TO SHANK OF CROSS BAR NO-4 (M. 0.00 TO M.1500.00 = 1500.00 m.)**

NOTES:

- THE ROAD HAS BEEN DESIGNED BASED ON THE FOLLOWING PARAMETERS:
a) ROAD WIDTH = 3.00m.
b) DESIGN LIFE 10 YEARS.
c) TRAFFIC GROWTH RATE 7.5%.
- BEFORE IMPLEMENTATION OF THE WORK IF ANY EXISTING STRUCTURE IN THE X-BUNDH REQUIRES REHABILITATION IT SHOULD BE INTIMATED TO THE DESIGN OFFICE FOR NECESSARY ACTION.
- THE CROSS BUND OVER WHICH THE ROAD IS TO BE CONSTRUCTED IS AN OLD STRUCTURE THAT HAS BEEN SUBJECTED TO VARIOUS VEHICULAR LOAD AS PER TECHNICAL REPORT HENCE IF ANY SECTION REQUIRES RE-SECTIONING, IT SHOULD BE INTIMATED TO THE DESIGN OFFICE FOR NECESSARY REVIEW.
- A MINIMUM COMPACTION LEVEL OF 90% MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD COMPACTION TEST SHOULD BE ENSURED FOR SUB-GRADE WORK.
- FOR SUB-GRADE CBR, VALUE AFTER 4-DAYS OF SOAKING SHOULD BE USED 90% OF ALL TEST VALUE SHOULD BE GREATER THEN OR EQUAL TO 2.
- IMPROVE SUBGRADE WILL COMPRISE ANY SAND, SILTY SAND OR OTHER LOW PLASTICITY MATERIALS WHICH WILL GIVE A CBR. VALUE IN EXCESS OF 8% WHEN COMPACTED AT A SUITABLE MOISTURE CONTENT (ITEM COAD 56-110).
- THE SUBBASE SHOULD HAVE MINIMUM CBR 25% BROKEN BRICK AND BRICK/SAND MIXTURE SHOULD BE USED FOR THE PURPOSE. (ITEM COAD 56-150)
- FOR THE CONSTRUCTION OF ROAD BASE COURSE FOLLOW ITEM COAD NO.56-230.
- ROAD CAMBER SHOULD BE MAINTAINED IN THE BASE LAYER WITH THE FINISHED CAMBER BEING A MINIMUM OF 2.5%.
- FOR THE PREPERATION OF THE WEARING SURFACE FOLLOW ITEM COAD NO. 56-240,56-300 &56-310.
- THE ROAD SHOULD BE CONNECTED WITH THE EXISTING METALLED ROAD ON BOTH SIDE WITH A SMOOTH SLOPE TO ENSURE EASY TRAFFIC MOVEMENT.
- THE WORK SHOULD BE EXECUTED AFTER OBTAINING ADMINISTRATIVE & FINANCIAL APPROVAL FROM THE COMPETENT AUTHORITY.
- THIS DRAWING IS PREPARED AS PER PROPOSAL & DESIGN DATA SUBMITTED BY PROJECT DIRECTOR , CAPITAL PILOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CDRSB) , BWDB DHAKA VIDE HIS OFFICE MEMO NO. PD/PUM-CDRSB/D-1/707. 10.09.2013.

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BANGLADESH WATER DEVELOPMENT BOARD	
OFFICE OF THE SUPERINTENDING ENGINEER DESIGN CIRCLE - VI	
DESIGN OF INSPECTION ROAD OVER 4-NOS CROSS BAR / CLOSURE CONSTRUCTED UNDER "CAPITAL PILOT DREDGING OF RIVER SYSTEM IN BANGLADESH (CDRSB)" IN UPAZILLA SIRAJGANJ SADAR, DIST. SIRAJGANJ UNDER SIRAJGANJ O&M DIVISION, BWDB, SIRAJGANJ DURING THE FY. 2013-2014 TO 2014-2015.	
DESIGNED : <i>Farzana Afreen</i> (FARZANA AFREEN) S.O.F.	RECOMMENDED : <i>MD. HASAN PARVEZ</i> S.E.
DRAWN : MD. MONIRUL ISLAM	APPROVED : <i>Jati Das Kundu</i> (JATI DAS KUNDU) CHIEF ENGINEER, DESIGN.
CHECKED : <i>Motaher Hossain</i> (MOTAHER HOSSAIN) E.E.	DATE : 03.12.2013
DWG. NO. HWZ/4(B)-7045	