

STANDARD BIDDING DOCUMENT FOR ACQUISITION OF CIVIL WORKS

**Construction of Gabion Type protection wall at Sr. no. 4109
and 4120 on Pushpavati River at village Dasaj, Ta: Unjha, Dist:
Mehsana**

Estimate Amount: -2,04,18,770.00/-

COMPLETE BIDDING DOCUMENT



**GOVERNMENT OF GUJARAT
Water Resources Department**

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INVITATIONFORBID
(IFB)

NATIONAL COMPETITIVE BIDDING

1. The invites bids for the construction of works detailed in the table. The bidders may submit bids for any or all of the following works.

Package No.	Name Of work	Approximate value of works (Rs.)	Bid security (Rs.)	Cost of document	Period of completion	#Class of Registration/ Category of contractor if required
1	2	3	4	5	6	7
1	Construction of Gabion Type protection wall at Sr. no. 4109 and 4120 on Pushpavati River at village Dasaj, Ta: Unjha, Dist: Mehsana	2,04,18,770.00/-	2,05,000.00/-	3600.00/-	11(Eleven) Months	Class B and above

2. Prospective/Interested bidder may download the Bid Documents from website <https://tender.nprocure.com> free of cost till the Time and Date as mentioned on online NIT at website <https://tender.nprocure.com>.

#

3. However, Bidder who is submitting the Bid Online will have to pay the Bid Document Fee / Tender Fee through Demand Draft only of any Schedule Bank payable at Visnagar and in favour of 'Executive Engineer, Dharoi Canal Division No-3, Visnagar'. Once the Bid is received online, Bid Document / Tender Fee will not be refundable. As Per GoGR & B Department's Circular No. PARACH/102/000/IB/221/(59)/CDated.24/01/2007

The Demand Draft for Bid Document / Tender fee and FDR / Bank Guarantee against Bid Security / EMD shall be submitted in electronic format through online (by scanning) while uploading the bid, this submission shall mean that bid document / tender fee and Bid Security / EMD has been received. Accordingly, the offer of only those shall be opened whose Bid Document / Tender Fee and Bid Security / EMD have been received electronically. However, for the purpose of realization of Demand Draft, and FDR / Bank Guarantee bidders shall send the same in original through R.P.A.D. so as to reach to # 'Executive Engineer, Dharoi Canal Division No-3, Visnagar', within 7 Days from the last day of bid submission.

Penalitive action for not submitting Demand Draft / FDR / Bank Guarantee in original to Executive Engineer / Tender Inviting Authority by bidder shall be initiated. **WRDGR No.PRC-102014-1-MICell-K.1Dated:29/10/2014**

4. Bids received online, will be opened on the time, date and place as specified in the online NIT at website <https://tender.nprocure.com> in the presence of the bidders or their authorized representatives, who wish to remain present.

If the office happens to be closed on the day of opening of the bids as specified, the bid will be opened on the next working day at the same time and venue.

5. A pre bid meeting will be held onathrs. at the office of to clarify the issues and to answer questions on any matter that may be raised at that stage as stated in clause 9.2 of 'instructions to Bidders' of the bidding documents.
6. #Bid Security (EMD) is equal to 1% of Estimated Amount put to bid / tender and should be rounded off to the next thousand rupees.
7. Other Information is as under:
 - A. Agencies can prepare and edit their offers a number of times before the end of the tender submission date and time. After the tender submission date and time, the bidder cannot modify / edit / withdraw their submitted offer in any case. No written or online request in this regard shall be granted.
 - B. Offers in physical form will not be accepted in any case.
 - C. Demand Draft purchased by the other than bidder and issued after the last date of submission of Bids, will not be considered or accepted.
 - D. The cost incurred by the contractor for this offer for clarification or attending discussion, conferences or site visits will not be reimbursed by the Employer or Engineer-in-Charge.
 - E. Conditional tenders shall not be accepted.
 - F. Any changes, addition, alternation made in the prescribed form attached with tender are liable to be rejected.
 - G. Any change in format or conditional Bank Guarantee will not be accepted and the bidder will be considered non-responsive.
 - H. All the bidders are instructed to fill in information strictly in accordance with the format given in the checklist/qualification document/tender document.
 - I. It is mandatory for the bidders to supply each and every information as asked strictly in electronic format at appropriate places only.
 - J. Blank / insufficient information shall be treated as nil information and shall result in disqualification.
 - K. Even if the bidder has been qualified in a similar or larger size of project in the past, it shall not be deemed to be a ground / reason for not giving required information for this work/bid.
 - L. Information supplied for earlier projects shall not be considered while evaluation of this bid. The Government will not ask for any other information, unless it is found absolutely necessary by the competent authority.
 - M. If found necessary, the contractor will be intimated for negotiation,

~~#For the works costing up to Rs. 7.5 crore (WRD Works), Rs. 7.0 crore (ROAD/BRIDGE/ BUILDING WORKS), Rs. 0.5 Crore (Electrical Works) kindly refer to GoGNWRWS&K Department's Circular No. Paracha/1097/1397(11)/pa.f.a./MICELL(k-1) dated 18/01/2018 and Dated 30/09/2022~~

~~For the works costing under Rs. 7.5 crore for Construction work of Water Resources Department, Rs. 7.0 crore for Roads, Bridges and Building and Rs. 050 crore~~
 Electrical work following documents shall be submitted in electronic format only through online by scanning and the (i) Bid Document Fee / Tender Fee (ii) Bid Security / EMD should be sent in original to the Tender opening authority through RPAD, so as to reach the Executive Engineer within 7 days from last day of submission of Bid.

- (i) Bid Document Fee / Tender Fee
- (ii) Bid Security / EMD or Valid EMD Exemption Certificate of Appropriate Class of Registration of Approved Contractors
- (iii) Registration Certificate of Appropriate Class
- (iv) Registration Certificate of special category – Road/Building and Category I/II/III, if required**
- (v) GST Number
- (vi) Work Experience, if necessary...
- (vii) Other Documents, as required...
- (viii) Bank Solvency Certificate of 20 % of Estimated Amount

SECTION-1
INSTRUCTIONSTOBIDDE
RS(ITB)

Section1:InstructionstoBidders

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A. GENERAL

1. Scope of Bid

- 1.1** The Employer (Named in Appendix to ITB) invites bids for the Construction of works **Construction of Gabion Type protection wall at Sr. no. 4109 and 4120 on Pushpavati River at village Dasaj, Ta: Unjha, Dist: Mehsana** detailed in the table given in IFB. The bidders may submit bids for any or all of the works detailed in the table given in IFB.
- 1.2** The successful bidder will be expected to complete the works by the intended completion date specified in the Contract data.
- 1.3** Throughout these bidding documents, the terms 'bid' and 'tender' and their derivatives (bidder/tenderer, bid/tender, bidding/tendering, etc.) are synonymous.

2. Source of Funds

- 2.1** The expenditure on this project will be met from the budget of Govt. of Gujarat / Govt. of India for centrally sponsored projects.

3. Eligible Bidders

- 3.1** This Invitation for Bids is open to all eligible bidders.
- 3.2** All bidders shall provide in Section 2, Forms of Bid and Qualification Information, a statement that the Bidder is neither associated, nor has been associated, directly or indirectly, with the consultant or any other entity that has prepared the design, specifications, and other documents for the Project or being proposed as Project Manager for the Contract. A firm that has been engaged by the Employer to provide consulting services for the preparation or supervision of the works, and any of its affiliates, shall not be eligible to bid.

4. Qualification of the Bidder

- 4.1** All bidders shall provide in Section 2, Forms of Bid and Qualification Information, a preliminary description of the proposed work method and schedule, including drawings and charts, as necessary. The proposed methodology should include a program of construction backed with equipment planning and deployment duly supported with broad calculations and quality assurance procedures proposed to be adopted justifying their capability of execution and completion of work as per technical specifications, within stipulated period of completion.
- 4.2** Deleted
- 4.3** Deleted
- 4.4** Deleted

~~#4.5 QUALIFICATION CRITERIA:~~

~~(Applicable for the works which require Pre Qualification) As Per Go GNWRWS & K Department's Circular No. Paracha/1097/1397(11)/pa.fa./MICELL(k-1) Dated 18/01/2018~~

- ~~4.5.1~~** ~~Qualification will be based on Applicant's meeting all the following minimum pass/fail criteria regarding the Applicant's general and particular experience, personnel and equipment capabilities and financial positions, as demonstrated by the applicant's responses in the forms attached to the letter of application (specified requirement for joint ventures are given under para 4.6 below). Subcontractor's experience and resources shall not be taken into account in determining the applicant's compliance with the qualifying criteria~~

To qualify for more than one contract, the applicant must demonstrate having experience and resources sufficient to meet the aggregate of the qualification criteria for each contract given in paragraphs 4.5.4, 4.5.5 and 4.5.9 below

4.5.2 Base year and Escalation

The base year shall be taken as Current financial year

Following enhancement factors will be used for the costs of work executed and the financial figure to a common base value for work completed in India.

<u>Year</u>	<u>Financial Year</u>	<u>Multiplying factor</u>
Base year of inviting tender	20__ 20__	1.00
-1	20__ 20__	1.10
-2	20__ 20__	1.21
-3	20__ 20__	1.33
-4	20__ 20__	1.46
-5	20__ 20__	1.61

Applicant should indicate actual figures of costs and amount for the work executed by them without accounting for the above mentioned factors.

In case the financial figures and value of completed works are in foreign currency the above enhanced multiplying factors will not be applied. Instead, the current market exchange rate (State Bank of India BC Selling rate as on the last date of submission of the bid) will be applied for the purpose of conversion of the amount in foreign currency into India rupees.

4.5.3. General Experience.

The Applicant shall meet with the following minimum criteria:

- (a) Achieved a minimum annual financial turnover of Rs. Crore for works in progress and completed in all classes of civil engineering construction works in any one year, over the last five financial years. _____
- (b) Experience in successfully completing or substantially completing at least one contract of similar work (.....) of at least 40 percent of the value of proposed contract within the last five financial years.

The works may have been executed by the applicant as prime contractor or as a member of a joint venture or as a nominated sub contractor. As subcontractor, he should have acquired the experience of execution of all major items of work under the proposed contract. In case a project has been executed by a joint venture, weight towards experience of the project would be given to each joint venture in proportion to their financial participation in the joint venture if work executed jointly otherwise as per the scope of work define in Joint Venture agreement.

Substantially completed works means those works which are at least 90 % completed as on the date of submission (i.e. gross value of work done up to the last date of submission is 90 % or more of the original contract price) and continuing satisfactorily.

For these, a certificate from the employers shall be submitted along with the application incorporating clearly the name of the work, contract value, billing amount, date of commencement of works, satisfactory performance of the contractor and any other relevant information.

(the experience certificate should be signed by the officer not below the rank of EE)

- (c) ~~Contractor should have completed 60% of quantity of principal items of work like concrete, earthwork, pipeline, pumping station etc. within last five financial years. Certificate of competent authority of work done with detail shall be produced.~~

4.5.4. Personnel Capabilities.

~~Availability for his work of personnel with adequate experience as required; as per Appendix.~~

4.5.5. Equipment Capabilities

~~Based on the studies carried out by the Engineer, the minimum suggested major equipment to attain the completion of works in accordance with the prescribed construction schedule are shown in the Appendix.~~

~~The bidders should, however, undertake their own studies and furnish with their bid, a detailed construction planning and methodology supported with layout and necessary drawings and calculation to allow the employer to review their proposals. The numbers, types and capacities of each plant/equipment shall be shown in the proposals along with the cycle time for each operation for the given production capacity to match the requirements.~~

4.5.6. Financial Position

The Applicant should give undertaking that he has access to, or has available, liquid assets (aggregate of working capital, cash in hand and uncommitted bank guarantees) and / or credit facilities up to 25 percent of the value of the contract / contracts applied.

The audited balance sheets for the last five years should be submitted, which must demonstrate the soundness of the applicant's financial position, showing long – term profitability including an estimated financial projection for the next two years. If necessary, the employer will make inquiries with the applicant's bankers.

4.5.7. Litigation History

The Applicant should provide accurate information on any litigation or arbitration resulting from contracts completed or under execution by him over the last five financial years. A consistent history of awards against the Applicant or any partner of a joint venture may result in failure of the applicant.

4.5.8. Disqualification

Even though the applicants meet the above criteria, they are subject to be disqualified if they have Made misleading or false representation in the forms, statements submitted, and / or Record of poor performance such as abandoning the work, rescinding of contract for which the reasons are attributable to the non – performance of the contractor; consistent history of litigation awarded against the applicant or financial failure due to bankruptcy. The rescinding of contract of a joint venture on account of reasons other than non – performance, such as Most Experienced partner of joint venture pulling out, court directions leading to breaking up of a joint venture before the start of work, which are not attributable to the poor performance of the contractor will, however, not affect the qualification of the individual partners.

- 4.5.9.** The bidder who have applied for corporate Debt Restructuring (CDR) / facing recovery proceedings from financial institutions / facing winding up processing / those under BIFR in the last 5 financial year shall be considered for bid qualification. However if the bank / financial institution has accepted the proposal of debt restructuring on or before the last date of online submission, the same shall be considered for further evaluation. An affidavit by bidder along with certificate from bank must be produced in such cases. In case of Joint Venture agreement, this provision shall be applicable for both lead partner and JV partner.

#4.6 JOINT VENTURE: (Maximum 3 Members i.e. 1 Lead & 2 Others)(Applicable only for estimated project cost of 50 Crore and above)

4.6.1. Joint ventures must comply with the following requirement:

(a) Following are the minimum qualification requirements:

(i) The lead partners shall meet not less than 50 percent of all criteria given in para **4.5.3 & 4.5.6** above. The joint venture must collectively satisfy the criteria of para 4.5.3 & 4.5.6 above. The experience of the other joint venture partners shall be considered if it is not less than 30 percent of the qualifying criteria in para 4.5.3 & 4.5.6 above.

(ii) Individually each member must satisfy the requirements of para 4.5.7 & 4.5.8 above.

(b) Bid shall be signed so as to legally bind all partners, jointly and severally, and shall be submitted with a copy of the joint venture agreement providing the joint and severall liabilities with respect to the contract.

4.6.2. Qualification of a joint venture does not necessarily qualify any of its partners individually or as a partner in any other joint venture. In case dissolution of a joint venture, each one of the constituent firms may qualify if they meet all the qualification requirements, subject to the written approval of the Employer.

4.7. Bid Capacity.

Applicants who meet the minimum qualification criteria will be qualified only if their available bid capacity at the expected time of bidding is more than the total estimated cost of the works. The available bid capacity will be calculated as under:

Assessed Available Bid Capacity = $(A * N - B)$, where

A = Maximum value of work executed in any one year during the last five years (updated to the price level of the year indicated in appendix) taking into account the completed as well as works in Progress.

B = Value at current price level of the existing commitments and ongoing works to be completed during the next (period of completion of work for which bids are invited); and

N = Number of years prescribed for completion of the works for which the bids are invited.

Note :- In Case of joint venture, the available bid capacity will be applied for each partner to the extent of his proposed participation in the execution of the work.

4.8 Even though the bidders meet the above qualifying criteria, they are subject to be disqualified if they have:

- Made misleading or false representation in the forms, statements and Attachments submitted in proof of the qualification requirements; and/or

- Record of poor performances such as abandoning the works, not properly completing the contract, inordinate delay in completion, litigation history, or financial failures etc.; and/or
- Participated in the previous bidding for the same work and had quoted an unreasonably high bid price and could not furnish rational justification to the employer.

5. One bid per bidder

5.1. Each bidder shall submit only one bid

for one package. A bidder who submits or participates in more than one bid (other than as a subcontractor or in cases of alternatives that have been permitted or requested) will cause all the proposals with the bidder's participation to be disqualified.

6. Cost of Bidding

6.1. The bidder shall bear all costs associated with the preparation and submission of his Bid, and the Employer will in no case be responsible and liable for those costs.

7. Site Visit

7.1. The Bidder, at the Bidder's own responsibility and risk is encouraged to visit and examine the Site of work and its surrounding and obtain all information that may be necessary for preparing the Bid and entering into a contract for construction of the Works. The cost of visiting the site shall be at the Bidder's own expense.

B. BIDDING DOCUMENTS

8. Content of Bidding Documents

8.1 The set of bidding documents comprises the documents listed below and addenda issued in accordance with Clause 10:

Section	Particulars	Volume No.
-	Invitation for Bids	I
1	Instructions to Bidders	
2	Qualification Information, and other forms	
3	Conditions of Contract	
4	Contract Data	
5	Technical Specifications	II
6	Form of Bid	III
7	Bill of Quantities	
8	Securities and other forms	
9	Drawings	IV
10	Documents to be furnished by bidder	V

8.2. Volumes I, II, III and IV are available online and documents to be furnished by the bidder in compliance to section 2 will be prepared by him and furnished as Volume-V in two parts (refer clause 12).

8.3. The bidder is expected to examine carefully all instructions, conditions of contract, contract data, forms, terms, technical specifications, bill of quantities, forms, Annexes and drawings in the Bid Document. Failure to comply with the requirements of Bid Documents shall be at the bidder's own risk. **Pursuant to clause 26 hereof**, bids which are not substantially responsive to the requirements of the Bid Documents shall be rejected.

9. Clarification Bidding Documents

9.1 A prospective bidder requiring any clarification of the bidding documents may notify the Employer in writing or through E-mail at the Employer's address indicated in the invitation to bid. The Employer will respond to any request for clarification which is received earlier than 15 days prior to the deadline for submission of bids. Employer's response will be published on website including a description of the enquiry but without identifying its source.

~~9.2. Pre-bid meeting~~

~~9.2.1. The bidder or his official representative is invited to attend a pre-bid meeting which will take place at the address, venue, time and date as indicated in the appendix.~~

- ~~9.2.2. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.~~
- ~~9.2.3. The bidder shall be required to submit any questions in writing or e-mail to reach the Employer not later than 03 days before the meeting.~~
- ~~9.2.4. Minutes of the meeting, including the question raised (Without identifying the source of enquiry) and the responses given will be published without delay on the tender website i.e. www.nprocure.com. Any modification of the bidding documents listed in sub Clause 8.1 which may become necessary as a result of the pre bid meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to Clause 10 and not through the minutes of the pre bid meeting.~~
- ~~9.2.5. Non-attendance at the pre bid meeting will not be a cause for disqualification of a bidder.~~

10. Amendment of Bidding Documents

- 10.1 Before the deadline for submission of bids, the Employer may modify the bidding documents by issuing addenda.
- 10.2 Any addendum thus issued shall be part of the bidding documents. The Employer will assume no responsibility for the same.
- 10.3 To give prospective bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer may, at his discretion, extend as necessary the deadline for submission of bids, in accordance with Sub-Clause 20.2 below.

C. PREPARATION OF BIDS

11. Language of the Bid

11.1 All documents relating to the bid shall be in the English language.

12. Documents Comprising the Bid

12.1. The bid to be submitted by the bidder as Volume V of the bid document (refer Clause 8.1) shall be in two separate parts:

Part I shall be named “Technical Bid” and shall comprise

- (i) Bid Security in the forms specified in Section 8
- (ii) Qualification Information and supporting documents as specified in Section 2
- (iii) Certificates, undertakings, affidavits as specified in Section 2
- (iv) Any other information pursuant to Clause 4.5 of these instructions
- (v) Undertaking that the bid shall remain valid for the period specified in Clause 15.1

Part II shall be named “Financial Bid” and shall comprise

- (i) Form of Bid as specified in Section 6
- (ii) Priced Bill of Quantities for items specified in Section 7

12.2. The Bidders shall submit the details/information pertaining to each part i.e. technical as well as financial and must be submitted online only.

12.3. Following documents will be deemed to be part of the bid.

Section	Particulars	Volume No.
	Invitation for Bids (IFB)	
1	Instruction to Bidders	Volume I
3	Conditions of Contract	
4	Contract Data	
5	Specifications	Volume II
9	Drawings	Volume IV

13. Bid Prices

13.1 The Contract shall be for the whole works as described in Sub-Clause 1.1, based on the priced Bill of Quantities submitted by the Bidder.

13.2 The bidder shall fill in rates and prices and line item total (both in figures and words) for all items of the Works described in the Bill of Quantities along with total bid price

(Both in figures and words). Items for which no rate or price is entered by the bidder will not be paid for by the Bill of Quantities.

- 13.3 All duties, taxes, and other levies except GST payable by the contractor under the contract, or for any other cause shall be included in the rates, prices and total Bid Prices submitted by the Bidder. (GST will be paid extra)

- 13.4 Deleted

- 13.5 The rates and prices quoted by the bidder are subject to adjustment during the performance of the Contract in accordance with the provisions of Clause 47 of the Condition of Contract (**Irrespective of the time limit and Bid Amount**)

14. Currencies of Bid and Payment

- 14.1 The unit rates and the prices quoted by the bidder shall be entirely in Indian Rupees. All payments shall be made in Indian Rupees.

15. Bid Validity

- 15.1 Bids shall remain valid for a period of not less than 120 days after the deadline date for bid submission specified in Clause 20.

- 15.2 In exceptional circumstances, prior to expiry of the original time limit, the Employer may request that the bidders may extend the period of validity for a specified period. A bidder may refuse the request without forfeiting his bid security. A bidder agreeing to the request will not be required or permitted to modify his bid, but will be required to extend the validity of his security for a period of the extension, and in compliance with Clause 16 in all respects.

#16. Bid Security

- 16.1. The Bidder shall furnish, as part of his Bid, a Bid security in the amount as shown in column 4 of the table of IFB for this particular work. This Bid security shall be in favor of Employer as named in Appendix and may be in one of the following forms;

- a. Bank Guarantee from any scheduled Indian bank, in the format given in Volume III. **(Bank Guarantee is applicable only for Bid Estimated Amount of 01 Crore and above) and Bank Guarantee of Scheduled and Private Banks shall be considered as per GoG Finance Department's Circular No. FD/MSM/e-file/4/2023/0057/D.M.O. Date 21/04/2023 or as per their latest amendment.**
- b. Fixed Deposit Receipt issued by any Scheduled Indian Bank or a foreign Bank approved by the Reserve Bank of India.

OR

A Valid Bid Security / EMD Exemption Certificate issued by (1) Road & Building Department or (2) Narmada Water Resources, Water Supply and Kalpsar Department of Govt of Gujarat. **Exemption Certificate is applicable only when Registration Certificate of Appropriate Class and Category of Approved Contractors is required as eligible criteria of bidder.**

- 16.2. Bank guarantees (and other instruments having fixed validity) issued as surety for the bid shall be valid for 45 days beyond the validity of the bid i.e. total validity of $120+45=165$ Days
- 16.3. Any bid not accompanied by an acceptable Bid Security and not secured as indicated in Sub-Clauses 16.1 and 16.2 above shall be rejected by the Employer as non-responsive.
- 16.4. The Bid Security of unsuccessful bidders will be returned within 28 days of the end of the bid validity period specified in Sub-Clause 15.1
- 16.5 The Bid Security of the successful bidder will be discharged when the bidder has signed the Agreement and furnished the required Performance Security.
- 16.6. The bid Security may be forfeited
- (a) If the Bidder withdraws the bid after Bid opening during the period of Bid validity.
 - (b) If the Bidder does not accept the correction of the Bid Price, if any, or
 - (c) In the case of a successful Bidder, if the Bidder fails to comply with the specified time limit to
 - (i) Sign the Agreement; or
 - (ii) Furnish the required Performance Security.
 - (d) If found necessary, the bidder will be intimated for negotiation. He will be intimated maximum three times within the validity period for negotiation. If contractor does not respond in time, his Bid Security (EMD) will be forfeited and his tender will be rejected. Punitive action will be taken on such contractors. (As per GoGR & B Dept's Gr. No. S/22/2017/639/D, Dt. 08/06/2018)

17. Alternative Proposals by Bidders.

- 17.1. Bidders shall submit offers that fully comply with the requirements of the bidding documents, including the conditions of contract (including mobilization advance or time for completion), basic technical design as indicated in the drawing and specifications. Conditional offers or alternative offers will not be considered further in the process of tender evaluation.

18. Format and Signing of Bid

- 18.1. The Bidder shall prepare documents comprising the bid as described in Clause 12 of these Instructions to bidder as the "Technical Bid" and "Financial Bid" in separate parts to be uploaded.

D. SUBMISSION OF BIDS

19. Deleted

20. Deadline for Submission of the Bids

20.1. Complete Bids must be received online by the Employer at the tender website specified above not later than the date indicated in appendix.

20.2. The Employer may extend the deadline for submission of bids by issuing an amendment in accordance with Clause 10, in which case all right and obligation of the Employer and the bidders previously subject to the original deadline will then be subject to the new deadline.

21. Deleted

22. Modification and Withdrawal of Bids

22.1. Bidders may modify or withdraw their bids online before the deadline prescribed in Clause 20 or pursuant to Clause 23.

22.2. Deleted

22.3. No bid shall be modified or withdrawn after the deadline for submission of Bid.

22.4. Withdrawal or modification of a bid between the deadline for submission of bids and the expiration of the original period of bid validity specified in Clause 15.1 above or as extended pursuant to Clause 15.2 may result in the forfeiture of the Bid security pursuant to Clause 16.

E. BID OPENING AND EVALUATION

23. Bid Opening

- ~~23.1 The Employer will open all the Bids received including modifications made pursuant to Clause 22, in the presence of the Bidders or their representatives who choose to attend at time, date and the place specified in Appendix in the manner specified in Clauses 20 and 23.3. In the event of the specified date of Bid opening being declared a holiday for the Employer, the Bids will be opened at the appointed time and location on the next working day.~~
- ~~23.2 Deleted.~~
- ~~23.3 The “Technical Bid” shall be opened. The amount, form and validity of the bid security furnished with each bid will be announced. If the bid security furnished does not conform to the amount and validity period as specified in the invitation for bid (ref. Column 4 and paragraph 3), and has not been furnished in the form specified in Clause 16, the technical bid will not be opened.~~
- ~~23.4 (i) Subject to confirmation of the bid security by the issuing Bank, the bids accompanied with valid bid security will be taken up for evaluation with respect to the Qualification information and other information furnished in part I of the bid pursuant to Clause 12.1.~~
- ~~(ii) If required, the bidder will be asked in writing to clarify his Qualification Documents with respect to any required clarification.~~
- ~~(iii) The bidders will respond in not more than 7 days of issue of the clarification letter.~~
- ~~(iv) Immediately (usually within 3 or 4 days), on receipt of these clarification the Evaluation Committee will finalize the list of responsive bidders whose financial bids are eligible for consideration.~~
- ~~23.5 Deleted~~
- ~~23.6 At the time of opening of “Financial Bid”, the names of the bidders were found responsive in accordance with Clause 23.4(iv) will be announced. The bids of only these bidders will be opened. The responsive Bidders’ names, the Bid prices, the total amount of each bid, any discount and such other details as the Employer may consider appropriate, will be announced by the Employer at the opening.~~
- ~~23.7 the time of opening of “Financial Bid”, the names of the bidders were found responsive in accordance with Clause 23.4(iv) will be announced. The bids of only these bidders will be opened. The responsive Bidders’ names, the Bid prices, the total amount of each bid, any discount, and such other details as the Employer may consider appropriate, will be announced by the Employer at the opening.~~
- ~~23.8 In case bids are invited for more than one package, the order for opening of the “Financial Bid” shall be in order of estimated amount of Bids from highest to lowest.~~
- ~~23.9 The Employer shall prepare minutes of the Bid opening, including the information disclosed to those present in accordance with Sub-Clause 23.6.~~

~~24. — ProcesstobeConfidential~~

~~24.1 Information relating to the examination, clarification, evaluation, and comparison of Bids and recommendations for the award of a contract shall not be disclosed to Bidders or any other persons not officially concerned with such process until the award to the successful Bidder has been announced. Any effort by Bidder to influence the Employer's processing of Bids or award decisions may result in the rejection of his Bid.~~

~~25. — Clarification of Financial Bids~~

~~25.1. To assist in the examination, evaluation, and comparison of Bids, the Employer may, at his discretion, ask any Bidder for clarification of his Bid, including breakdowns of unit rates. The request for clarification and the response shall be in writing or by e-mail, but no change in the price or substances of the Bid shall be sought, offered, or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Bids.~~

~~25.2 Subject to sub clause 25.1, no Bidders shall contact the Employer on any matter relating to his Bid opening to the contract is awarded. If the Bidder wishes to bring additional information to the notice of the Employer, it should do so in writing.~~

~~25.3. Any effort by the Bidder to influence the Employer in the Employer's bid evaluation, bid comparison or contract award decision may result in the rejection of the Bidders' bid.~~

~~26. — Examination of Bids and Determination of Responsiveness~~

~~26.1 During the detail evaluation of "Technical Bid", the Employer will determine whether each Bid (a) meets the eligibility criteria defined in Clause 3 and 4; (b) has been properly signed; (c) is accompanied by the required securities and; (d) is substantially responsive to the requirements of the Bidding document. During the detailed evaluation of the "Financial Bid", the responsiveness of the bids will be further determined with respect to the remaining bid conditions, i.e., priced bill of quantities, technical specifications, and drawings.~~

~~26.2 A substantially responsive "Financial Bid" is one which confirms all the terms, conditions and specifications of bidding documents, without material deviation or reservation. A material deviation or reservation is one (a) which affects in any substantial way the scope, quality, or performance of the Works; (b) which limits in any substantial way, inconsistent with the Bidding documents, the Employer's rights or the Bidder's obligations under the Contract; or (c) whose rectification would affect unfairly the competitive position of other Bidders presenting substantially responsive Bids.~~

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

~~27. — Deleted~~

28. Deleted**29. Evaluation and Comparison of Financial Bids**

- 29.1. The Employer will evaluate and compare only the Bids determined to be substantially responsive in accordance with Sub-Clause 26.2.
- 29.2. Deleted.
- 29.3. The Employer reserves the right to accept or reject any variation or deviation. Variation and deviations and other factors, which are in excess of the requirements of the Bidding documents or otherwise result in unsolicited benefits for the Employer, shall not be taken into account in Bid evaluation.
- 29.4. The estimated effect of the price adjustment conditions under Clause 47 of the Conditions of Contract, during the period of implementation of the Contract, will not be taken into account in Bid evaluation.
- 29.5. If the Bid of the successful Bidder is seriously unbalanced in relation to the Engineer's estimate of the cost of work to be performed under the contract the Employer may require the Bidder to produce detailed consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, the Employer may require that the amount of the performance security set forth in Clause 34 be increased at the expense of the successful bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.
- 29.6. A bid which contains several items in the bill of Quantities which are unrealistically priced low and which cannot be substantiated satisfactorily by the bidder may be rejected as non-responsive.

30. Deleted

F. AWARD OF CONTRACT

31. Award Criteria

- 31.1. Subject to Clause 32, the Employer will award the contract to the Bidder whose Bid has been determined.
- (i) to be substantially responsive to the Bidding documents and who has offered the lowest evaluated Bid Price; and
 - (ii) to be within the available bid capacity adjusted to account for his bid price which is the lowest evaluation in any of the packages opened earlier than the one consideration.
- In no case, the contract shall be awarded to any bidder whose available bid capacity is less than the evaluated bid price, even if the said bid is the lowest evaluated bid. The contract will in such cases be awarded to the next lowest bidder at this evaluation bid price.

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

- 32.1. Notwithstanding Clause 31, the Employer reserves the right to accept or reject any Bid, and to cancel the Bidding process and reject all Bids, at any time prior to the award of contract, without thereby incurring any liability to the affected bidder or Bidder or any obligation to inform the affected Bidder or Bidders of the grounds for the Employer's action.

33. Notification of Award and Signing of Agreement

- 33.1. The Bidder whose Bid has been accepted will be notified of the award by the Employer prior to expiration of the Bid validity period by cable, telex or facsimile confirmed by registered letter. This letter (hereinafter and in the condition of contract called the "Letter of Acceptance") will state the sum that the Employer will pay the Contractor in consideration of the execution, completion, and maintenance of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Contract called the "Contract Price").
- 33.2. The notification of award will constitute the formation of the contract, subject only to the furnishing of a performance security in accordance with the provisions of Clause.
- 33.3. The Agreement will incorporate all agreements between the Employer and the successful Bidder. It will be signed by the Employer and to the successful Bidder, within 28 days following the notification of award along with the Letter of Acceptance. Within 21 days of receipt, the successful Bidder will sign the Agreement and deliver it to the Employer.
- 33.4. Upon the furnishing by the successful Bidder of the Performance Security, the Employer will promptly notify the other Bidders that their Bids have been unsuccessful.

34. Performance Security

- 34.1. (A) Within 10 (Ten) days of receipt of Letter of Acceptance, the successful Bidders shall furnish to the Employer an irrevocable and unconditional guarantee from a Bank in the form set forth in Section 8 (the "Performance Security") for an amount equal to 5% (five percent) of its Contract Price. In case of bids mentioned below, the successful Bidder, along with the Performance Security,

shall also furnish to the Authority an irrevocable and unconditional guarantee from a Bank in the same form given at Section 8 towards an Additional Performance Security (The “Additional Performance Security”) for an amount calculated as under:

- (a) If the Contract Price offered by the Selected Bidder is lower than 10% but upto 20% of the Estimated Project Cost, then the Additional Performance Security shall be calculated @ 20% of the difference in the (i) Estimated Project Cost (as mentioned in Bid Document) - Minus 10% of the Estimated Project Cost and (ii) Contract Price offered by the selected Bidder.
- (b) If the Contract Price offered by the Selected Bidder is lower than 20% of the Estimated Project Cost, then the Additional Performance Security shall be calculated @ 30% of the difference in the (i) Estimated Project Cost (as mentioned in Bid Document) - Minus 10% of the Estimated Project Cost and (ii) Contract Price offered by the selected Bidder.
- (c) This Additional Performance Security shall be treated as part of the Performance Security.
- (B) The Performance Security shall be valid beyond 60 (Sixty) days from the stipulated date of completion of the project and the Additional Performance Security shall be valid beyond 28 (twenty-eight) days of Project Completion Date.
Performance Security shall become refundable/releasable within 15 days after certified project completion date subject to Fulfillment of contractual obligation and settlement of all dues and claims.

34.2. If the performance security is provided by the successful Bidder in the form of a Bank Guarantee, it shall be issued either (a) at the Bidder's option, by a Nationalized/Scheduled Indian bank or (b) by a foreign bank located in India and acceptable to the Employer. As per GoG Finance Department's Circular No. FD/MSM/e-file/4/2023/0057/D.M.O. Date 21/04/2023 or as per their latest amendment.

34.3. Failure of the successful Bidder to comply with the requirement of Sub-Clause 34.1 shall constitute sufficient grounds for cancellation of the award and forfeiture of the Bid Security.

~~35 — Advance Payment and Security~~

~~35.1 The Employer will provide an Advance payment on the Contract Price as stipulated in the Conditions of Contract, subject to maximum amount, as stated in the Contract Data.~~

36. Deleted

37. Corrupt or Fraudulent Practices

37.1 The Employer will reject a proposal if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in completing for the contract in question and will declare the firm ineligible, either indefinitely or for a stated period of time, to be awarded a contract with National Highways Authority of India/ State PWD and any other agencies, if it at any time determines that the firm has engaged in corrupt or fraudulent practices in completing for the contractor, or in execution.

37.2 Furthermore, Bidders shall be aware of the provision stated in Sub-Clause 59.2 of the Conditions of Contract.

APPENDIX TO ITB

Clause Reference With respect to Section –I

1.	The Name of the Employer is Executive Engineer, Dharoi Canal Division No.3, Visnagar	[Cl.1.1]
2.	The last five financial years.	
	2022-23	
	2021-22	
	2020-21	
	2019-20	
	2018-19	
3.	This Annual Financial Turnover Amount is Rs.	[Cl.4.5.3(a)]
4.	Value of Work is Rs. 2,04,18,770.00/-	
5.	Deleted	
6.	The cost of electric work is Rs.	
7.	The cost of water supply/sanitary work is Rs.	
8.	Liquid assets and/or availability of credit facilities is Rs.	[Cl.4.5.6]
9.	Price level of the financial year 2023-24	[Cl.4.5.2]
10.	The pre-bid meeting will take place at	[Cl.9.2.1]
11.	The technical Bid will be opened at the office of the Superintending Engineer, Sujlam Sufalam Cicle No 2, Mahesana on dt..... at AM/PM	
12.	Address of the Employer: Executive Engineer, Dharoi Canal Division no-3, Dharoi Colony, Mahesana-kheralu Road, Visnagar, 384315	
13.	Deleted	
14.	The bid should be submitted latest by As stated on online NIT	[Cl.20.1&20.2]
15.	The bid will be opened at As stated on online NIT	[Cl.23.1]
16.	The Bank Draft in favor of Executive Engineer, Dharoi Canal Division No.3, Visnagar	
17.	Deleted	
18.	Escalation factors (for the cost of work executed and financial figure to a common base value) for work completed	[Cl.4.5.2]

<u>Year</u>	<u>Financial Year</u>	<u>Multiplying factor</u>
Base year of inviting tender	20__-20__	1.00
-1	20__-20__	1.10
-2	20__-20__	1.21
-3	20__-20__	1.33
-4	20__-20__	1.46
-5	20__-20__	1.61

#LISTOFKEYPLANT&EQUIPMENTTOBEDEPLOYEDONCONTRACTWORK

[ReferenceCL.4.5.5]

Thecontractorsshallalsogivealistofmachineriessin hispossessionandwhichtheyproposetouseonthework.

Sr. No.	Plant or Machinery	Location	Age of Machinery (maximum 15 years)	Make	Capacity	Approximate Value	Remark
1	2(a)	2(b)	3	4	5	6	7

List of Key Personnel to be deployed on Contract Work

(Reference Cl.4.5.4)

#Employment of a qualified site Engineer by the Contractor.

The Contractor shall employ full-time technically qualified staff during the execution of this work as under:-

1. Two graduate Civil Engineers and three diploma Civil Engineers when cost of the work to be executed is more than Rs.50 lakhs.
2. One graduate & two Diploma, Civil Engineers when the cost of the work to be executed is more than Rs.15 lakhs but less than Rs.50 lakhs.
3. Minimum Two Diploma Civil Engineer when the cost of work is less than Rs.15 lakhs but more than Rs.5 lakhs.
4. Minimum One Diploma Civil Engineers for the work when the cost of work to be executed is less than Rs. 5 lakhs. The Engineer so employed for the Government work must have sufficient experience to handle the work independently. Such an Engineer shall have to stay at the site of work and he shall not be entrusted with other duty except this work.

In case the contractor or partner of the contractor firm is a Civil Graduate Engineer, Employment of a separate Engineer will not be necessary provided that the Engineer partner himself attends the execution of the work on the site.

Within 15 days of issue of work-order the Contractor will have to furnish to the Deputy Executive Engineer-in-charge of the work the Name, Qualifications, copy of mark sheet, Color Photograph and the appointment order issued such as engineers engaged for this contract work. If 15 days after issue of work order such designated Site Engineers do not resume or do not remain present on site of work, the recovery at the rate of Rs.15,000-00 per month per Engineer will be made from the bills/deposit/dues of the contractor. Such recovery shall be non-refundable.

SECTION-2
QUALIFICATIONINFORMATION

QUALIFICATION INFORMATION

The information to be filled in by the Bidder in the following pages will be used for the purpose of post qualification as provided for in Clause 4 of the Instruction to Bidders. This information will not be incorporated in the Contract.

1. For Individual Bidders

1.1 Constitution or legal status of Bidder (Attach Copy)

Place of registration _____

Principal place of business _____

Power of attorney of signatory of Bid

(Attach)

1.2 Total value of Civil engineering constructions _____ 20
 020 Work performed in the last five years _____ 20 _____ 20
 in Rs. Lakhs) _____ 2020
 _____ 20 _____ 20
 _____ 20 _____ 20

15.2.1 Work performed as prime contractor, work performed in the past as a nominated sub-contractor will also be considered the sub-contract involved execution of all main items of work described in the bid documents, provided further that all other qualification criteria are satisfied (in the same name) on works of a similar nature over the last five years** and in current year before the submission of the bid.

Project Name	Name of the Employer	Description of work	Contract No.	Value of contract (Rs. Crore)	Date of issuance of work order	Stipulated period of completion	Actual date of completion*	Remarks explaining reasons for delay & work Completed

* Attach certificate(s) from the Engineer(s) in charge

** Immediately preceding the financial year in which bids are received.

~~#1.3.2 Quantities of work executed as prime contractor, work performed, in the past as anominatedsub contractor,willalso be considered provided the sub-contract involved execution of all main items of work described in the bid document, provided, further that all other qualification criteria are called (in the same name and style) in the last five years** and in current year before the submission of the bid.~~

*To be modified as per the nature and scope of work

Year	Name of the work	Name of the Employer	Quantity of work performed (Cum/MT)				Remarks *(indicate contract Ref)
			Cement Concrete (Including RCC & PCC) ITEM1	Masonry ITEM2	Earth Works ITEM3	Bituminous Work ITEM4	
20_20							
20_20							
20_20							
20_20							
20_20							

1.4 Information on Bid Capacity (works for which bid have been submitted and works which are yet to be completed) as on the date of this bid.

(A) Existing commitments and on-going works:

Description of works	Place & State	Contract No.	Name & Address of Employer	Value of Contract (Rs. Cr)	Stipulated Period of Completion	Value of Works* remaining to be completed (Rs. Cr)	Anticipation of completion
1	2	3	4	5	6	7	8

*Attach certificate(s) from the Engineer(s) in charge

**Immediately preceding the financial year in which bids are received.

1.5 Availability of key items of Contractors Equipment for carrying out the works (Ref. Clause 4.5.5). The Bidders should list all the information requested below.

Item of Equipment	Requirement		Availability Proposals			Remarks (from whom to be purchased)
	NO	Capacity	Owned/Leased to be procured	Nos./Capacity	Age/Conditions	

- 1.6 ~~Qualifications and experience of key personnel required for administration and execution of the contract. Attach biographical data. Refer also to Sub Clause 9.1 of the Conditions of Contract.~~

Position	Name	Qualification	Year- of Experi- ence (General)	Year- of experience- in the proposed position
Project Manager				
Etc.				

- 1.7 ~~Proposed sub-contract and firms involved~~

Sections of the works	Value of Sub- Contractor	Sub- Contractor (Na me & Address)	Experience- in similar work

~~Attach copies of certificates on possession of valid license for executing water supply/sanitary work/building electrification works.~~

- 1.8 Financial reports for the last five years: balance sheets, profit and loss statements, auditors' reports (in case of companies/corporations), etc. List them below and attach copies.
- 1.9 Evidence of access to financial resources to meet the qualification requirements: cash in hand, lines of credit, etc. List them below and attach copied documents.
- 1.10 Name, address, and telephone, telex, and fax numbers of the Bidders bankers whomay provide references if contacted by the Employer.
- 1.11 Information on Litigation history in which the Bidder is involved.

Other- Party (ie s)	Employer	Cause- of Disput e	Amount Involved	Remarks- showing Present Status

- 1.12. Statement of compliance under the requirements of Sub Clause 3.2 of the instruction to Bidders. (Name of Consultant engaged for project preparations is*)
-
-

- 1.13 Proposed work method and schedule. The Bidders should attach descriptions, drawings and charts as necessary to comply with the requirements of the Bidding documents. (Refer ITB Clause 4.1)

- 1.14 Programme

2. Deleted

3. Additional Requirements

- 3.1 Bidders should provide any additional information required _____ to _____ fulfill
_____ there requirement
sof Clause 4 of the Instruction to the Bidders, if applicable.

- (i) Affidavit
- (ii) Undertaking

* _____ Fill the name of Consultant

SAMPLE FORMAT FOR EVIDENCE OF ACCESS TO OR AVAILABILITY OF CREDIT FACILITIES

(CLAUSE 4.5.6 OF
ITB) BANK CERTIFICATE

ATE

This is to certify that M/s.

_____ is a reputed company with
a good financial standing.

If the contract for the work, namely

_____ is awarded to the above
firm, we shall be able to provide overdraft/credit facilities to the extent of
Rs.

_____ to meet their working capital requirements for executing the above during the
contract period.

(Signature) Name

of Bank

Senior Bank

Manager Address of the Bank

k

AFFIDAVIT

1. I, the undersigned, do hereby certify that all the statements made in the required attachments are true and correct.
2. The undersigned also hereby certifies that neither our firm M/s. _____ have not abandoned any work of Government of Gujarat/Government of India/any Board or Corporation under Government of Gujarat/Government of India nor any contract awarded to us for such work has been rescinded, during last five years prior to the date of this bid.
3. The undersigned hereby authorize(s) and request (s) any bank, person, firm or corporation to furnish pertinent information deemed necessary and requested by the Department to verify this statement or regarding any (our) competence and general reputation.
4. The Undersigned understands and agrees that further qualifying information may be requested, and agrees to furnish any such information at the request of the Department/Project implementing agency.

(Signed by an Authorized Officer of the Firm)

Title of Officer

Name of Firm

Date

UNDERTAKING

I, the undersigned do hereby undertake..... that our firm M/s
 would invest a minimum cash
 upto 25% of the value of the work during implementation of the contract.

 (Signed by an Authorized officer of the firm)

 Title of officer

 Name of firm

 DATE

SECTION-3
CONDITIONS OF CONTRACT

Conditions of Contract

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CONDITIONS OF CONTRACT

A. GENERAL.

1. Definitions

- 1.1 Terms which are defined in the Contract Data are not also defined in the Conditions of Contract but keep their defined meaning.

Bill of Quantities means the priced and completed Bill of Quantities forming part of the Bid

Compensation Events are those defined in Clause 44 hereunder

The **Completion Date** is the date of completion of the Works as certified by the Engineer in accordance with Sub Clause 55.1

The Contract is the contract between the Employer and Contractor to execute, complete and maintain the Works **till the completion of Defects Liability Period**. It consists of the documents listed in Clause 2.3 below.

The **Contract Data** defines the documents and other information which comprise the Contract.

The **Contractor** is a person or corporate body whose Bid to carry out the Work has been accepted by the Employer.

The **Contractor's Bid** is the completed Bidding document submitted by the Contractor to the Employer and includes Technical and Financial Bids.

The **Contract Price** is the price stated in the Letter of Acceptance and thereafter as adjusted in accordance with the provisions of the Contract.

Days are calendar days: **months** are calendar months.

The **Defects Liability Period** is the period named in the Contract Data and calculated from the Completion Date.

The **Employer** is the party who will employ the Contractor to carry out the Works.

The **Engineer** is the person named in the Contract Data (or any other competent person appointed and notified to the contractor to act in replacement of the Engineer) who is responsible for supervising the Contractor, administering the Contract, certifying payments due to the Contractor, issuing and valuing Variations to the Contract, awarding extensions of time, and valuing the Compensation Events.

Equipment is Contractor's machinery and vehicles brought temporarily to the site to construct the Works.

The **Initial Contract Price** is the Contract Price listed in the Employer's Letter of Acceptance.

The **Intended Completion Date** is the date on which it is intended that the Contractor shall complete the Works. The Intended Completion Date is specified in the Contract Data. The Intended Completion Date may be revised only by the Engineer by issuing an extension of time.

Materials are all supplies, including consumables, used by the contractor for incorporation in the works.

Plant is any integral part of the work which is to have mechanical, electrical, electronic or chemical or biological functions.

The **Site** is the area defined as such in the Contract Data.

Site Investigation Reports are those which were included in the Bidding documents and are factual interpretive reports about the surface and subsurface conditions at the site.

Specifications means the Specifications of the works included in the Contract and any modification or addition made or approved by the Engineer.

The **Start Date** is given in the Contract Data. It is the date when the Contractor shall commence execution of the works. It does not necessarily coincide with any of the Site Possession Dates.

A **Subcontractor** is a person or corporate body who has a Contract with the Contractor to carry out a part of the work in the Contract which includes work on the Site.

Temporary Works are works designed, constructed, installed, and removed by the Contractor which are needed for construction or installation of the Works.

A **Variation** is an instruction given by the Engineer, which varies the

Works. The **Works** are what the Contract requires the Contractor to construct, install, and turn over to the Employer, as defined in the Contract Data.

2. Interpretation

- 2.1 In interpreting these Conditions of Contract, singular also means plural, male also means female or neuter and the other way around. Heading have no significance. Words have their normal meaning under the language of the Contract unless specifically defined. The Engineer will provide instructions clarifying queries about Conditions of Contract.
- 2.2 If sectional completion is specified in the Contract Data, references in the Conditions of Contract to the Works, the Completion date, and Intended Completion Date apply to any Section of the Works (other than references to the Completion Date and Intended Completion date for the whole works)
- 2.3 The documents forming the Contract shall be interpreted in the following order of priority
 - (1) Agreement
 - (2) Letter of Acceptance, notice to proceed with works
 - (3) Contractor's Bid

- (4) ContractData
- (5) ConditionsofContractincludingConditionsofContract
- (6) Specifications
- (7) Drawings
- (8) Billsofquantitiesand
- (9) AnyotherdocumentlistedintheContractDataasformingpartoftheContract.

3. LanguageandLaw

- 3.1 The language of the Contract and the law governing the Contract are stated intheContract Data.

4. EngineersDecisions

- 4.1 Exceptwhereotherwisepecificallystated,theEngineerwilldecidecontractualmattersbetweentheEmployerand theContractorintherolerepresentingtheEmployer.

5. Delegation

- 5.1 The Engineer may delegateany of his duties and responsibilities to otherpeopleafter notifying theContractorand may cancelany delegationafternotifyingtheContractor.

6. Communications

- 6.1 Communications between parties which are referred to in the conditions areeffectiveonlywheninwriting.Anoticeshallbeeffectiveonlywhenitisdelivered(in terms ofIndianContract Act).

~~7. Sub Contracting~~

- ~~7.1 The Contractor may subcontract any portion of work, up to a limit specified incontractdata,withtheapprovaloftheengineerbutmaynotassigntheContractwithouth eapprovaloftheEmployerinwriting.SubcontractingshallnotaltertheContractor'soblig ations.~~**Sub-contractingofsupplyorspecificitems of workisnot allowed.**

- ~~7.2 The sub-contractor must be registered in appropriate class and category forthe partofworktobesubcontracted.~~

8. OtherContractors

- 8.1 TheContractorshallcooperateandsharetheSitewithothercontractors,public authorities, utilities and the Employer between the dates given in theSchedule of other Contractor. The Contractors shall as refer to in the ContractData,alsoprovidefacilitiesandservicesforthemasdescribedintheSchedule. The employer may modify the schedule of other contractors andshallnotifythecontractorofanysuch modifications.

9. Personnel

- 9.1 The Contractor shall employ the key personnel named in the Schedule of Key Personnel as referred to in the Contract Data to carry out the functions stated in the Schedule or other personnel approved by the Engineer. The Engineer will approve any proposed replacement of key personnel only if their qualifications, abilities, and relevant experience are substantially equal to or better than those of the personnel listed in the Schedule.
- 9.2 If the engineer asks the Contractor to remove a person who is a member of the Contractor Staff or his work force stating the reasons the Contractor shall ensure that the person leaves the Site within seven days and has no further connection with the work in the Contract.

10. Employer's and Contractor's Risks

- 10.1 The Employer carries the risk which these Contract states are Employer's risks, and the Contractor carries the risks which these Contracts states are Contractor's risk.

11. Employer's Risks

- 11.1 The employer is responsible for the excepted risks which are (a) in so far as they directly affect the execution of the Works, the risks of war, hostilities, invasion, act of foreign enemies, rebellion, revolution, insurrection or military or usurped power, civil war, riot commotion or disorder (unless restricted to the Contractor's employees), and contamination from any nuclear fuel or nuclear waste or radioactive toxic explosive.

12. Contractor's Risks

- 12.1 All risks of loss of or damages to physical property and of personal injury and death which arise during and in consequence of the performance of the Contract other than the excepted risks are the responsibility of the Contractor.

13. Insurance

- 13.1 The Contractor shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start date to the end of the Defects Liability Period, in the amounts and deductibles stated in the Contract data 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 damages of property (except the Works, Plant, Materials and Equipment) in connection with the Contract; and

(d) Personal injury or death.

- 13.2 Policies and certificates for insurance shall be delivered by the Contractor to the Engineer for the Engineer's approval before the Start Date. All such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.

13.3 If the Contractor does not provide any of the policies and certificates required, the Employer may affect the insurance which the Contractor should have provided and recover the premiums the Employer has paid from payments so otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.

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

13.5 Both parties shall comply with any conditions of the insurance policies.

14. Site Investigation Report

14.1 The Contractor in preparing the Bid shall rely on any site Investigation reports referred to in the Contract Data, supplemented by any information available to the Bidder.

15. Queries about the Contract data

15.1 The Engineer will clarify queries on the Contract Data

16. Contractor to Construct the Works

16.1 The Contractor shall construct and install the works in accordance with the specification and Drawings.

17. The Works to be completed by the Intended Completion Date

17.1 The Contractor may commence execution of the Works on the Start Date and shall carry out the Works in accordance with the programme submitted by the Contractor, as updated with the approval of the Engineer, and complete them by the Intended Completion date

18. Approval by the Engineer

18.1 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.

18.2 The Contractor shall be responsible for design of temporary works.

18.3 The Engineer's approval shall not alter the Contractor's responsibility for design of the Temporary works.

18.4 The Contractor shall obtain approval of third parties to the design of the Temporary works where required.

18.5 All Drawings prepared by the Contractors for the execution of the temporary or permanent work are subject to prior approval by the Engineer before their use.

19. Safety

19.1 The Contractor shall be responsible for the safety of all activities on the Site.

20. Discoveries

- 20.1 Anything of historical or other interest or of significant value unexpectedly discovered on the site is the property of the Employer. The contractor is to notify the engineer of such discoveries and carry out the Engineer's instructions for dealing with them.

21. Possession of the Site

- 21.1 The Employer shall give possession of all parts of the site to the Contractor. If possession of a part is not given by the date stated in the Contract Data the Employer is deemed to have delayed the start of the relevant activities and this will be a Compensation Event.
- 21.2 If within 25% of the time limit of the project, 80% of possession of the site is not handed over to the Contractor, then contractor/ Employer may fore-close the contract. Contractor/ Employer has to foreclose the work within 30 days after lapse of 25%-time limit and after 30 days foreclosure option will be closed.

22. Access to the Site

- 22.1 The Contractor shall allow the Engineer and any person authorized by the Engineer access to the Site, to any place where work in connection with the Contract is being carried out or is intended to be carried out and to any place where materials or plants are being manufactured/ fabricated/ assembled for the works.

23. Instructions

- 23.1 The Contractor shall carry out all instructions of the Engineer pertaining to works which comply with the applicable laws where the site is located.
- 23.2 The Contractor shall permit the Employer to inspect the Contractor's accounts and records relating to the performance of the Contractor and to have them audited by auditors appointed by the Employer, if so required by the Employer.

24. Disputes

- 24.1 If the Contractor is of the view that a decision taken by the Engineer was either outside the authority given to the Engineer by the Contract or that the decision was wrongly taken, the decision shall be referred to the **Superintending Engineer** (Sujlam Suflam Circle No.2, Mehsana) within 14 days of the notification of the Engineer's decision. If the issue is not resolved, any party can refer the matter for conciliation within 15 days from the decision given by the **Superintending Engineer** (Sujlam Suflam Circle No.2, Mehsana).

24.224.2

- (a) For the work up to Rs.100 Cr., if any of the parties is not satisfied with the decision of the **Superintending Engineer** (Sujlam Suflam Circle No.2, Mehsana), both the parties have to refer to the Chief Engineer concerned for the conciliation process.
- (b) ~~For the work more than Rs.100 Cr., if any of the parties is not satisfied with the decision of the #Superintending Engineer (Sujlam Suflam Circle No.2, Mehsana), both the parties have to refer to the #Secretary, Water Resources Department, Government of Gujarat for the conciliation process.~~

If the dispute is not resolved through the conciliation process, he may refer the dispute to Gujarat Public Works Contract Dispute Arbitration Tribunal. If the Contractor fails to refer a claim / dispute to the Higher Authority within 14 days of the notification of the Engineer's decision, the Contractor shall not be entitled to any additional payment/claim if he doesn't follow the above sequence in stipulated time and he should not stop the work.

25. Procedure for Disputes

- 25.1 The arbitration shall be conducted in accordance with the arbitration procedure stated in the Special Conditions of Contract.

26. Work Order Book

- 26.1. A work order book as prescribed by the Govt. shall be maintained on the work site and the contractor shall sign the orders in token of acceptance as given by the Engineer in charge or his representative. He shall carry out in the true spirit and as required for the contract performance. Work order book is the property of the department and shall remain in the custody of the department supervisory staff on duty. The field compliance shall be carried out promptly and reported to the Engineer in charge in good time by the contractor so that the work can be checked. If the contractor fails to take note of the orders or instructions issued in the work order or tries to avoid the same, Engineer in charge shall have power to take suitable actions. Any such action of the Engineer for the Noncompliance on the part of the contractor shall be binding upon him.

B.TIMECONTROL

27. Programme

- 27.1 Within the time stated in the Contract Data the Contractor shall submit to the Engineer for approval a Programme showing the general methods, arrangements, orders, and timing for all the activities in the works along with monthly cash flow forecast.
- 27.2 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.
- 27.3 The Contractor shall submit to the Engineer, for approval an updated programme at intervals no longer than the period stated in the Contract data. If the Contractor does not submit an updated programme within this period, the Engineer may withhold the amount stated in the Contract data from the next payment after the date on which the overdue programme has been submitted.
- 27.4 The Engineer's approval of the programme shall not alter the Contractor's obligations. The Contractor may revise the programme and submit it to the Engineer again at any time. A revised programme is to show the effect of Variations and Compensations events.

28. Extension of the Intended Completion Date

- 28.1 The Engineer shall extend the Intended Completion Date if a compensation Event occurs or a Variation is issued which makes it impossible for completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining work and which would cause the Contractor to incur additional cost.
- 28.2 The Engineer shall decide whether and by how much to extend the Intended Completion Date within 35 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 new Intended Completion Date.
- 28.3 The Engineer shall within 14 days of receiving full justification from the contractor for extension of Intended Completion Date refer to the Employer his decision. The employer shall in not more than 21 days communicate to the engineer the acceptance or otherwise of the Engineer's decision. If the employer fails to give his acceptance, the Engineer shall not grant the extension and the contractor may refer the matter under Clause 24.1

29. Deleted

30. Delays Ordered by the Engineer

- 30.1 The Engineer may instruct the Contractor to delay the start or progress of any activity within the works.

31. Management Meetings

- 31.1 Either the Engineer or the Contractor may require the other to attend a management meeting. The business of a management meeting shall be to review the plans for remaining work and to deal with matters raised in accordance with the early warning procedure.
- 31.2 The Engineer shall record the business of management meetings and is to provide copies of his record to those attending the meeting and to the Employer. The responsibility of the parties for actions to be taken is to be decided by the Engineer either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

32. Early Warning

- 32.1 The Contractor is to warn the Engineer at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the work, increase the Contract price or delay the execution of works. The Engineer may require the contractor to provide an estimate of the expected effect of the future event or circumstance on the contract price and completion date. The estimate is to be provided by the Contractor as soon as reasonably possible.
- 32.2 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 by anyone involved in the work and in carrying out any resulting instruction of the Engineer.

C.QUALITYCONTROL

#33. IdentifyingDefects/Defectliabilityperiod

33.1:Defect liability period: The contractor shall be responsible to make good andremedy at his own expense any defect which may develop or may be noticedbefore the period mentioned hereunder from the certified date of completion.The Engineer in charge shall give the contractor a notice in writing about thedefects and the contractor shall make good the same within 15 days of receiptof the notice. In the case of failure on the part of the contractor, the Engineer-in-charge may rectify or remove or re-execute the work at the risk & cost ofthe contractor. The Engineer-in-charge shall be entitled to appropriate thewhole or any part of the amount of security deposit towards the expenses, ifany, Incurred by him in rectification, removal or re-execution. The DefectsLiabilityperiodshall be asunder....

A. Forworks ofWRDExcept Building

- (a) (1) For all works costing up to Rs. 50,000 (amount put to tender), the periodshallbe 3Months fromthecertifieddate of completion.
- (b) (1) For WRD works likes Check Dam/Canal / Drainage / Road Structuretender amount from RS. 50,000 to 10,00,000, the defect liability period shallbe12months fromthecertified date of completion.
(2)ForWRDworkexceptlikesCheckDam/Canal/Drainage/RoadStructure tender amount from RS. 50,000 to 10,00,000, the defect liabilityperiodshall be 6monthsfromthecertifieddateofcompletion.
- (c) (1) For WRD works likes CheckDam/Canal / Drainage / Road Structuretender amount more than RS. 10,00,000, the defect liability period shall be 3Years fromthecertifieddate ofcompletion.
(2)ForWRDworkexceptlikesCheckDam/Canal/Drainage/RoadStructure tender amount from RS. 10,00,000 to 1 Crore, the defect liabilityperiodshall be 12months fromthecertified date of completion.
- (d) (1) For all WRD works of tender amount more than RS. 1 Crore, the defectliabilityperiodshall be3Yearsfromthecertifieddateof completion

B. ForBuildingworksofWRD:-

ForBuildingworksofWRD,FollowtheR&BCirculardated.03/12/2009

For original building works the defect liability period will be 4 years or elapseof 4 monsoon period following date of possession of building taken over byuseragencyfollowingthecertifieddateofcompletion, whicheverislater.

For the purpose of deciding the monsoon period, the 30th September shall betreatedasthe lastdate.

WRDCircularNo.Matas/102013/MICELL(K-1)Dated13/12/2013

33.2ForRoadworks:

Freemaintenanceguaranteeperiodforworksof**Road/Bridgeconstruction**

- a. For resurfacing work of road free maintenance guarantee period one yearfromthedata ofcompletion.
- b. In case of widening of the road/strengthening of the road/bridge, thecontractor shall have to give four years free maintenance guarantee fromthe certified date of completion. During this period the contractor shallvisit the site every six months along with the concerned Section Officer /Deputy Executive Engineer and will examine the work already carried outin this contract like road work, jungle cutting, side shoulders, side gutter,road furniture, patta etc. and will prepare Km. wise inspection report dulysigned by all concerned and any defect observed shall be done within 15days by the contractor at his risk and cost as per the direction of Engineerincharge.Thecontractorneedstodovideographyofthesevisitsandrequiretosub mitatthetimeofreleaseofFMG.IfB.T.thesurfaceduring

the maintenance period of 4 years is worn out then agency shall have to provide renewal coating as per tender item as directed by the Engineer-in-charge. The amount equivalent to 5% of each running bill shall be withheld and will be released after the free maintenance guarantee period (i.e. 4 years) is over.

However, this amount shall be released against fixed deposit or bank guarantee pledged in the name of Executive Engineer after completion certificate of work is issued.

- (1) The flakiness and elongation index (combined) for coarse aggregates under no circumstances shall exceed the allowable limit set forth in the relevant clause for the material in question.

- (2) 2% of the amount eligible for the payment of bituminous items shall be withheld till the miscellaneous items like earthwork in embankment/cutting for side shoulders, side gutters, kilometer/indicator/guard stones, sign board etc. are completed in all respect by the contractor. After completion of the miscellaneous items, the above said 2% withheld amount shall be released.

(Govt. of Gujarat's G.R.No.: TNC-10-2013-3 (Part-3)/C, Dtd. 13/12/2013).

- (3) Videography for the surface under Maintenance Guarantee is to be done as per Govt. letter No.: SSR/10/2015-16/26/C, Dtd. 26/11/15 for the work costing more than Rs. 5.00 Crore.

- (4) Setting up of adequate laboratory & deployment of quality engineers.

The contractor shall have to set up the laboratory with adequate equipment. Till the setting up of adequate laboratory is completed & reported of this to the engineer (subject to due verification by engineer's representative) by contractor in writing, Rs. 2,00,000/- shall be withheld. The qualified quality Engineers shall be deployed exclusively for this contract by the contractors. If quality Engineer is not deployed by contractor within one month after the date of work order, the amount equivalent to Rs. 20,000 per month shall be recovered till the actual deployment of quality engineer. The amount so recovered towards the deployment of quality engineers shall not be refunded.

- (5) Asphalt work will have to be cross checked as per G.R.No.: RGN/60/2006/35/C, dtd. 31/05/07 before final bill is paid.

- (6) Maintenance during Construction Period

During the Construction Period, the Contractor shall maintain, at his own risk and cost, the existing lane(s) of the road so that the traffic worthiness and safety thereof are at no time materially inferior as compared to their condition 10 (ten) days prior to the date of the Agreement, and shall undertake the necessary repair and maintenance works for this purpose; provided that the Contractor may, at this cost, interrupt and divert the flow

of traffic if such interruption and diversion is necessary for the efficient progress of works and conform to Good Industry Practice; provided

further that such interruption and diversion shall be undertaken by the Contractor only with the prior written approval of the Executive Engineer which approval shall not be unreasonably withheld. For the avoidance of doubt, it is agreed that the Contractor shall at all times be responsible for ensuring safe operation of the road.

- 33.3 The Engineer shall check the Contractor's work and notify the Contractor of any defects that are found. Such checking shall not affect the Contractor's responsibilities. The Engineer may instruct the Contractor to search for a Defect and to uncover and test any work that the Engineer considers may have a Defect.

34 Tests

- 34.1 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.

- 34.2 #1% of amount of work done for works up to 10 crore of estimated cost should be deducted from R.A. Bill of the Contractor for testing for the quality of material workmanship where as for estimated cost of work more than 10 crore, the charges for testing of quality of material workmanship shall be deducted from R.A. Bill of contractor as per actual charges.

- 34.3 Agency has to establish testing laboratory on site for the various test to be carried out in the work for this purpose agency shall construct a pukka laboratory building with all facility on site at locations specified by the engineer in charge.

35 Correction of defects

- 35.1 The engineer shall give notice to the Contractor of any defects before the end of the defects Liability Period, which begins at Completion and is defined in the contract data. The Defects Liability Period shall be extended for as long as Defects remain to be corrected.

- 35.2 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.

36 Uncorrected Defects

- 36.1 If the Contractor has not corrected a defect within the time specified in the Engineer's notice, the Engineer will assess the cost of having the Defect corrected, and the Contractor will pay this amount.

D. COST CONTROL

37 Bill of Quantities

37.1 The bill of Quantities shall contain items for the constructions, installation, testing and commissioning work to be done by the Contractor.

37.2 The bill of Quantities is used to calculate the Contract price. The Contractor is paid for the quantity of the work done at the rate in the Bill of Quantities for each item.

38 Change in the Quantities

38.1 The Engineer shall have power to make any alterations in or addition to the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work and the contractor shall be bound to carry out the work in accordance with any instruction in this connection which may be given to him in writing signed by the Engineer and such alteration shall not invalidate the contract and any additional work which the contractor may be directed to do in the manner above specified as part of the work shall be carried out by the contractor on the same conditions in all respects on which he agreed to do the main work and at the same rate as are specified in the tender for the main work.

Except that when the quantity of any item exceeds the quantity as in the tender by more than 130%, the contractor will be paid for the quantity in excess of 130%, at the rate entered in the SOR of the year during which the excess in quantity is first executed.

39 Variations

39.1 All Variations shall be included in updated programmes produced by the Contractor.

40 Payments for Variations

40.1 If the additional or altered work includes any class of work for which no rate is specified in this contract, then such class of work shall be carried out as under.

40.1.1 At the rate derived from the item within the contract which is comparable to the one involving additional or altered class of work; where there are more than one comparable items, the item of the contract which is nearest in comparison with regard to class or classes of the work involved shall be selected and the decision of the Superintending Engineer as to the nearest comparable item shall be final and binding on the contractor.

40.1.2 If the rate cannot be derived in accordance with (i) above, such class of work shall be carried out at the rate entered in the Schedule of Rates of the division

for the year in which the tender was received, increased or decreased by the percentage by which the tender amount is more or less as compared to

the amount arrived at the rates in the "Schedule of Rates" of the Division in the year in which the tender was received. If the Schedule of rates of the Division does not contain all the items, the percentage increase or decrease of the tender shall be calculated considering such items which were included in the "Scheduled Rates" of the division for the year and for materials consumed on such item the rate to be charged would be the basic rate taken into account for fixing the rate in S.O.R. referred to above.

40.1.3 If it is not possible to arrive at the rate from (i) and (ii) above, such class of work shall be carried out at the rate decided by the competent authorities on the basis of detailed rate analysis after hearing the contractor before a Committee of two Superintending Engineers stationed at the same place or the nearest place.

40.2 If the additional or altered work, for which no rate is entered in the "Schedule of Rates" of the Division is ordered to be carried out before the rate is agreed upon, then the contractor shall within seven days of the date of receipt by him of the order to carry out the work, inform the Engineer-in-charge of the rate, which it is his intention to charge for such class of work and if the Engineer in charge does not agree to this rates, he shall by notice in writing be at liberty to cancel his order to carry out such class of work and arrange to carry it out in such manner as he may consider it advisable, provided always that if the contractor shall commence work or incur any expenditure in regard thereof before the rates shall have been determined as lastly herein before mentioned, then in such cases he shall only be entitled to be paid in respect of the work carried out or expenditure incurred by him prior to the date of the determination of the rate as aforesaid according to such rate or rates as shall be fixed by the Engineer-in-charge. In the event of the dispute, the decision of the Superintending Engineer of the Circle shall be final.

Where, however, the work is to be executed according to the designs, drawings and specifications recommended by the contractor and accepted by the competent authority, the alternation above referred to shall be within the scope of such designs, drawings and specifications appended to the tenders.

The time limit for the completion of the work shall be extended in the proportion that the increase in the cost occasioned by alterations bears to the cost of the original work and the certificate of the Engineer-in-charge as to such proportion shall be final and conclusive.

41 Cash Flow Forecasts

41.1 When the programme is updated, the contractor is to provide the engineer with an updated cash flow forecast.

42 Payment certificates.

42.1 The Contractor shall submit to the Engineer monthly statements of the estimated value of the work completed less the cumulative amount certified previously.

42.2 The Engineer shall check the Contractor's monthly statement within 14 days and certify the amount to be paid to the Contractor after taking in to account any credit or debit for the month in question in respect of materials for the works in the relevant amounts and under conditions set forth in sub-clause 32.3 of the Contract Data (secured Advance).

42.3 The value of work executed shall be determined by the Engineer.

42.4 The value of work executed shall comprise the value of the quantities of the items in the Bill of Materials completed.

42.5 The value of work executed shall include the evaluation of variations and compensation events.

42.6 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.

43 Payments

43.1 Payments shall be adjusted for deductions for advance payments, retention, other recoveries in terms of the contract and taxes at source, as applicable under the law. The Employer shall pay the Contractor the amounts certified by the Engineer within 28 days of the date of each certificate.

43.2 Payment of GST (prevailing rates) on the amount payable under the contract to the Contractor will be made by the Employer. Hence, it is the responsibility of the contractor to pay the GST to the concerned Authority.

43.3 Items of the works for which no rate or price has been entered in will not be paid by the Employer and shall be deemed covered by other rates and prices in the Contract.

44 Compensation events

44.1 The following are compensation Events unless they are caused by the Contractor:

- (a) The Employer does not give access to a part of the Site by the site Possession date stated in Contract Data to the Contractor

44.2 In case of a compensation event occurs and it prevents the work being completed beyond the Intended Completion Date then Authority will approve EOT with eligible contractual price escalation.

45 Tax

45.1 The rates quoted by the Contractor must be inclusive of all taxes prevailing on due date of bid submission except GST. However, any subsequent changes in the tax structure by Government after due date of bid submission will be compensated (+/-) on availability or submission of actual documentation. Contractor will have to intimate Engineer regarding changes occurred in the tax structure after bid submission. If the contractor fails to provide such information and if any financial obligation may arise due to change in tax structure, same will be recovered from the contractor.

45.2 GST will be paid separately on the bills. Hence, it is the responsibility of the contractor to pay the GST to the concerned Authority.

46 Currencies.

46.1 All payments shall be made in Indian Rupees.

47 Price Adjustment

47.1 Contract price shall be adjusted for increase or decrease in rates and price of labour, materials, fuels and lubricants in accordance with the following principles and procedures and as per formula given in the contract data:

(a) The price adjustment shall apply for the work done from the start date given in the contract data up to end of the initial intended completion date or extensions granted by the Engineer and shall not apply to the work carried out beyond the stipulated time for reasons attributable to the contractor.

(b) The price adjustment shall be determined during each month from the formula given in the contract data.

(c) Following expressions and meanings during to the work done during each month

$R = \text{Total value of work done during the month. It would include the amount of secured advance granted, if any, during the month less the amount of secured advance recovered, if any during the month. It will exclude value for work executed under variations for which price adjustment will be worked separately based on the terms mutually agreed.}$

47.2 To the extent that full compensation for any rise or fall in costs to the contractor is not covered by the provisions of this or other clause in the contract, the unit rates and prices included in the contract shall be deemed to include amounts to cover the contingency of such other rise or fall in costs.

48 Retention

48.1 The Employer shall retain from each payment due to Contractor the proportion stated in the Contract Data until Completion of the whole of the Works.

48.2 On Completion of the whole of the Works half the total amount retained is repaid to the Contractor and half when the Defects Liability Period has passed and the Engineer has certified that all Defects notified by the Engineer to the Contractor before the end of this period have been corrected.

48.3 On completion of the whole works, the contractor may substitute retention money with an "on demand" Bank guarantee.

In case, Contractor requests for refund of the Retention Money deducted by the Employer under the provision of this clause, Employer shall consider the said request of the Contractor provided that the refund hereunder shall be made in tranches of not less than 1% (One Percent) of the Contract Price and Contractor furnishes an irrevocable and unconditional Bank Guarantee for an equal amount substantially in the format of Bank Guarantee for Performance Guarantee enclosed with SBD and valid up to 60 days beyond the scheduled / extended Defects Liability Period. On completion of the whole works, the contractor has however an option to submit a fresh irrevocable and unconditional Bank Guarantee for an amount equal to 5% of the total value of work executed substantially in the format of Bank Guarantee for Performance Guarantee enclosed with SBD and valid up to 60 days beyond the Defect Liability Period and yet refund the Retention Money Bank Guarantee submitted for refund of Retention Money.

49 Liquidated Damages

49.1 The Contractor shall pay liquidated damages to the Employer at the rate per day stated in the Contract Data for each day that the Completion Date is later than the Intended Completion Date (for the whole works or the milestone as stated in the contract data). The total amount of liquidated damages shall not exceed the amount defined in the Contract Data. The Employer may deduct liquidated damages from payment due to the Contractor. Payment of liquidated damages does not affect the Contractor's liabilities.

49.2 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. The Contractor shall not be entitled for any interest on the over payment calculated from the date of payment to the date of repayment.

49.3 If the contractor fails to comply with the time for completion as stipulated in the tender, then the contractor shall pay to the employer the relevant sum stated in the Contract Data as Liquidated damages for such default and not as penalty for every day or part of day which shall elapse between relevant time for completion and the date stated in the taking over certificate of the whole of the works on the relevant section, subject to the limit stated in the contract data.

The employer may, without prejudice to any other method of recovery deduct the amount of such damages from any monies due or to become due to the contractor. The payment or deduction of such damages shall not relieve

the contractor from his obligation to complete the works on from any other of his obligations and liabilities under the contract.

49.4 If, before the Time for Completion of the whole of the Works or, if applicable any Section, a Taking Over Certificate has been issued for any part of the Works or of a Section, the liquidated damages for delay in completion of the remainder of the Works or of that Section shall, for any period of delay after the date stated in such Taking-Over-Certificate, and in the absence of alternative provisions in the Contract, be reduced in the proportion which the value of the part so certified bears to the value of the whole of the Works or Section, as applicable. The provisions of this Sub-clause shall only apply to the rate of liquidated damages and shall not affect the limit thereof.

~~50—Bonus~~

~~50.1 If the contractor achieves completion of the whole of the works prior to the intended Completion Date prescribed in Contract Data the Employer shall pay to the contractor a sum stated in Contract Data as bonus for every completed month but subjected to maximum amount as stated in Contract Data; which shall elapse between the date of completion of all items of works as stipulated in the contract, including variations ordered by the Engineer and the time prescribed in Clause 17.~~

~~50.2 Bonus shall be paid only to works amounting to above INR 5 crore with time limit of the works is equal or more than 6 months. The bonus would be paid as under~~

% of Time Saved	% of Initial Contract Price entitled for Bonus
50%	5%
40%	4%
30%	3%
20%	2%
10%	1%
Less than 10%	0%

~~51—Advance Payment.~~

~~51.1 The Employer shall make advance payment (not to be paid less than two installments except in special circumstances for which there is to be Recorded in writing) to the Contractor of the amounts stated in the Contract Date by the date stated in the Contract Date, against provision by the Contractor of an Unconditional Bank Guarantee in a form and by a bank acceptable to the Employer in amounts and currencies equal to be at least 110% of the advance payment. The guarantee shall remain effective until the~~

~~advance payment has been repaid, but the amount of the guarantee shall be progressively reduced by the amounts repaid by the Contractor. The Mobilization advance would be deemed as interest bearing advance at an interest rate of 10% to be compounded, quarterly.~~

~~51.2 The Contractor is to use the advance payment only to pay for Equipment, plant and Mobilization expenses required specifically for execution of the Works. The Contractor shall demonstrate that advance payment has been used in this way by supplying copies of invoices or other documents to the engineer.~~

~~51.3 The advance payment shall be repaid by deduction of proportionate amount from payments otherwise due to the Contractor, following the schedule of completed percentages of the Works on a payment basis. No account shall be taken of the advance payment or its repayment in assessing valuation of work done, variations, price adjustments, Compensation Events, or Liquidated damages.~~

51.4 Deleted

52 Securities

52.1 The performance Security (including additional security for unbalanced bids) shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount and form and by a bank or surety acceptable to the Employer, and denominated Indian Rupees. The performance Security shall be valid until a date 60 days from the certified date of completion of the project and the additional security for unbalanced bids shall be valid until a date 28 days from the date of issue of the certificate of completion of the work.

52.2 Performance and Additional Performance Security shall become refundable/releasable within 15 days after project certified completion date subject to fulfillment of contractual obligation and settlement of all dues and claims.

53 Deleted

54 Cost of Repairs.

54.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start date and the end of Defects Correction periods shall be remedied by the Contractor at the Contractor's cost if the loss or damages arise from the Contractor's acts or omissions.

E. FINISHING THE CONTRACT

55 Completion

55.1 The Contractor shall request the Engineer to issue a Certificate of Completion of the works and the Engineer will do so upon deciding that the work is completed.

56 Taking Over

56.1 The Employer shall take over the Site and the Works within seven days of the Engineer issuing a certificate of Completion.

57 Final Account

57.1 The Contractor shall supply to the Engineer a detailed final account of the total amount that the Contractor considers payable as full and final settlement of all claims under the Contract for items before the end of the Defects Liability Period. The Engineer shall issue a Defect Liability Certificate and certify any final payment that is due to the Contractor within 56 days of receiving the Contractor's account if it is correct and complete. If it is not, the Engineer shall issue within 56 days a schedule that states the scope of the corrections or additions that are necessary. If the Final Account is still unsatisfactory after it has been resubmitted, the Engineer shall decide on the amount payable to the Contractor and issue a payment certificate, within 56 days of receiving the Contractor's revised account.

57.2 If reversal in characteristic of tender (L1 becoming L2) on account of excesses and savings in final account is observed, the Engineer/Employer shall be at liberty to restrict the final payment of BOQ items to the lowest amount evaluated of the bids considering the final quantities and the rates quoted including therebates if any. Payment of variation items shall however be made at the rates approved by the Employer, within 90 days from the physical completion of work.

~~58 Operating and Maintenance Manuals~~

~~58.1 If "as built" drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the Contract data.~~

~~58.2 If the Contractor does not supply the Drawings and/or manuals by the dates stated in the Contract data, or they do not receive the Engineer's approval, the Engineer shall withhold the amount stated in the Contract Data from payments due to the Contractor.~~

59 Termination

59.1 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.

59.2 Fundamental breaches of Contract include, but shall not be limited to the following:

- 59.2.1 The contractor stops work for 28 days when no stoppage of work is shown on the current programme and the stoppage has not been authorized by the Engineer
- 59.2.2 The Engineer instructs the Contractor to delay the progress of the Works and the instruction is not withdrawn within 28 days;
- 59.2.3 The Employer or the Contractor is made bankrupt or goes into liquidation other than for a reconstruction or amalgamation
- 59.2.4 A payment certified by the Engineer is not paid by the Employer to the Contractor within 56 days of the date of the Engineer's certificate
- 59.2.5 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;
- 59.2.6 The Contractor does not maintain a security which is required;
- 59.2.7 The Contractor has delayed the completion of works by the number of days for which the maximum amount of liquidated damages can be paid as defined in the Contract data; and
- 59.2.8 If the Contractor, in the judgment of the Employer has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

For the purpose of this paragraph: "corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution. "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the borrower, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at an artificial non-competitive level and to deprive the Borrower of the benefit of free and open competition.

59.3 When either party to the Contract gives notice of a breach of contract to the Engineer for a cause other than those listed under Sub Clause 59.2 above, the Engineer shall decide whether the breach is fundamental or not.

59.4 Notwithstanding the above, the employer may terminate the Contract for convenience.

60 Payment upon Termination

60.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Engineer shall issue a Certificate for the value of the work done less advance payments received up to the date of the issue of the

certificate, less other recoveries due in terms of the contract, less taxes due to be deducted at source as per applicable law and less the percentage to apply to the work not completed as indicated in the Contract data. Additional Liquidated Damages shall not apply. If the total amount due to the Employer exceeds any payment due to the Contractor the difference shall be a debt payable to the Employer.

60.2 If the Contract is terminated at the Employer's convenience or because of a fundamental breach of Contract by the Employer, the Engineer shall issue a certificate for the value of the work done, the cost of balance material brought by the contractor and available at site, the reasonable cost of removal of equipment, repatriation of the Contractor's personnel employed solely on the works, and the Contractor's cost of protecting and securing the Works and less advance payment received up to the date of the certificate, less other recoveries due in terms of the contract and less taxes due to be deducted at source as per applicable law.

61 Property

61.1 All materials on the Site, Plant Equipments, Temporary Works and Works are deemed to be property of the Employer, if the Contract is terminated because of a Contractor's default.

62 Release from Performance

62.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Employer or the Contractor, the 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 work carried out before receiving it and for any work carried out afterwards to which commitment was made.

F. SPECIAL CONDITIONS OF CONTRACT

63 LABOUR

The Contractor shall, unless otherwise provided in the Contract, make his own arrangements for the engagement of all staff and labour, local or other, and for their payment of housing, feeding and transport.

The Contractor shall, if required by the Engineer, deliver to the Engineer a return in detail, in such form and at such intervals as the Engineer may prescribe, showing the staff and the numbers of the several classes of labour from time to time employed by the Contractor on the site and such other information as the Engineer may require.

64 COMPLIANCE WITH LABOUR REGULATIONS

During continuance of the contract, the Contractor and his sub-contractor shall abide at all times by all existing labour enactments and rules made thereunder, regulations, notification and bye laws of the State or central Government or local authority and any other labour law (including rules), regulations, bye laws that may be passed or notifications that may be issued under any labour law in future either by the State or the Central Government or the local authority. Salient features of some of the major labour laws that are applicable to the construction industry are given below. The Contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent authority on account of contravention of any of the provisions of any Act or rules made thereunder, regulations or notifications including amendments. If the Employer is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for observance of the provisions stipulated in the notifications/byelaws/Acts/Rules/regulations including amendments, if any, on the part of the Contractor, the Engineer/employer shall have the right to deduct any money due to the Contractor including his amount of performance security. The Employer/Engineer shall also have the right to recover from the Contractor any sum required or estimated to be required for making good the loss or damages suffered by the Employer.

The employees of the Contractor and the Sub-Contractor in no case shall be treated as the employees of the Employer at any point of time.

SALIENT FEATURES OF SOME MAJOR LABOUR AND OTHER LAWS
APPLICABLE
TO ESTABLISHMENTS ENGAGED IN BUILDING AND OTHER CONSTRUCTIONS WORK

- A) **Workmen Compensation Act 1923**:- The Act provides for compensation in case of injury by accident arising out of and during the course of employment.
- B) **Payment of Gratuity Act. 1972**:- Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years service or more on death, the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.
- C) **Employees P.F. and Miscellaneous Provision Act 1952**:- The Act Provides for monthly contributions by the employer plus workers @ 10% or 8.33% The benefits payable under the Act are:
1. Pension or family pension on retirement or death, as the case may be.
 2. Deposit linked insurance on the death in harness of the worker.
 3. Payment of P.F. accumulation on retirement/death etc.
- D) **Maternity Benefit Act 1951**:- The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.
- E) **Contract Labour (Regulation & Abolition) Act 1970**: The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided, by the Principal Employer by Law. The principal Employer is required to take Certificate of Registration and the Contractor is required to take license from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Employer, if they employ 20 or more contract labour.
- F) **Minimum Wages Act 1948** :- The Employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act, if the employment is a scheduled employment. Construction of Building, Roads, Runways are scheduled employment.
- G) **Payments of wages Act 1936**:- It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.
- H) **Equal remunerations Act 1979**:- The Act provides for payment of equal wages for work of equal nature to Male and Female workers and for not making discrimination against female employees in the matter of transfer, training and promotion etc.
- I) **Payments of Bonus Act 1965**:- The Act is applicable to all establishments employing 20 or more employees. The Act provides for payment of annual bonus subject to a minimum of 8.33% of wages and maximum of 20 % of wages to employees drawing Rs. 3500/- per month or less. The bonus to be paid to employees getting Rs. 2500/- per month or above Rs. 3500/- per month shall be worked out by taking wages as Rs. 2500/- per month only. The Act does not

apply to certain establishments. The newly set-up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of this Act.

- J) **Industrial Disputes Act 1947:-** The Act lays down the machinery and procedure for resolutions of Industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.
- K) **Industrial employment (standing Orders) Act 1946 :-** It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the State and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and get the same certified by the designated Authority.
- L) **Trade Unions Act 1926:-** The Act lays the procedure for registration of trade unions of workmen and employers. The Trade Unions registered under the Act have given certain immunities from civil and criminal liabilities.
- M) **Child Labour (Prohibition & Regulation Act 1986:-**
The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of Child labour is prohibited in Building and Construction Industry.
- N) **Inter – State Migrant workmen’s (Regulation of Employment & Conditions of service) Act 1979:-** The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The inter-state migrant workmen, is an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home up to the establishment and back, etc.
- O) **The Building and Other Construction workers (Regulation of employment and Conditions of Service) Act 1996 and the Cess Act of 1996:-**
All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under this Act.
All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be modified by the government. The Employer of the establishment is required to provide safety measures at the Building or construction work and other welfare measures, such as canteens, First Aid facilities, Ambulance, Housing accommodations for workers near the workplace etc. The Employer to whom the Act applies has to obtain a registration certificate from the Registering Officers appointed by the Government.

- P) **Factories Act 1948** :-The Act lays down the procedure for approval of plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power engaged in the manufacturing process.
- Q) **Royalty charges**-The contractor shall pay the royalty to the competent authority as per rule. The royalty charges paid shall be borne by the contractor and shall not be reimbursed by the Employer.
- R) **Following Pollution control Acts and amendments made there off from time to time shall be applicable.**
1. Water(Preservation and control of Pollution) Act, 1974
 2. Air(Prevention and Control of Pollution Act 1981
 3. Environmental(Protection) Act 1986

The contractor must commit to adopting Environmental management plan for best energy use, waste management, the reduction of pollution as in EMS (Environmental Management system) ISO-14001-2015

65 ARBITRATION(GCC Clause 24)

The procedure for arbitration will be as follows:-

- 24.1 If the Contractor is of the view that a decision taken by the Engineer was either outside the authority given to the Engineer by the Contract or that the decision was wrongly taken, the decision shall be referred to **#Superintending Engineer (Higher Authority)** (Sujlam Suflam Circle No, 2, Mehsana) within 14 days of the notification of the Engineer's decision. If the issue is not resolved, any party can refer the matter for conciliation within 15 days from the decision given by the **#Superintending Engineer**.

24.2

- (a) For the work up to Rs.100 Cr., if any of the parties is not satisfied with the decision of the **#Superintending Engineer** ((Sujlam Suflam Circle No, 2, Mehsana), both the parties have to refer to the **#Chief Engineer** concerned for the conciliation process.
- (b) For the work more than Rs.100 Cr., if any of the parties is not satisfied with the decision of the **Superintending Engineer**, both parties have to refer to the **#Secretary, Water Resources Department, Government of Gujarat** for the conciliation process.

If the dispute is not resolved through the conciliation process, contractor may refer the dispute to Gujarat Public Works Contract Dispute Arbitration Tribunal. If the Contractor fails to refer a claim / dispute to the **Higher Authority** within 14 days of the notification of the Engineer's decision, the Contractor shall not be entitled to any additional payment/claim if he doesn't follow the above sequence in stipulated time. However, during such period, he would not stop the work in any case.

SECTION-4
CONTRACTDATA

#CONTRACTDATA

		Clause Reference
Item marked "N/A" do not apply to this Contract.		With respect to section 3
1.	The Employer is Name: Executive Engineer, Dharoi Canal Division No.3, Visnagar Address: Dharoi Canal Division No.3, Dharoi Colony, Visnagar Name of authorized Representative (will be intimated later)	[CL.1.1]
2.	The Engineer is Executive Engineer Name of Authorized Representative: Executive Engineer, Dharoi Canal Division No.3, Visnagar	
3.	The Defects Liability Period is 3 (Three) Years from the date of completion.	[CL.1.1 & 33]
4.	The Start Date shall be 1st days from the date of issue of the Notice to proceed with the work.	[CL.1.1]
5.	The Intended Completion Date for the whole of the work is 11 (Eleven) Months after start of work with the following milestones: Milestone dates: <u>Physical work to be completed Period from the start date</u> Milestone 1 i.e. 25% 3 Months. Milestone 2 i.e. 50% 5 Months. Milestone 3 i.e. 75% 9 Months. Milestone 4 i.e. 100 % 11 Months.	[CL.1.1, 17 & 2] [CL.2.2 & 49.1]
6.	The Site is located at Dasaj, Ta- Unjha and Dist: Mehsana.	[CL.1.1]
7.	The name and identification number of the Contract is: Construction of Gabion Type protection wall at Sr. no. 4109 and 4120 on Pushpavati River at village Dasaj, Ta: Unjha, Dist: Mehsana	[CL.1.1]
8.	The work consists of 200 mt. long Gabion wall with non-woven geofabric filter and required pilot cut of the flow of river to divert from bank of river The works shall, inter alia, include the following, as Specified or as directed:	[CL.1.1]

(A) WRD Works

Site clearance; setting-out and layout; Construction and Maintenance of all types of dams and its component, earthen dam; spillway; installation of gate; excavation and earthwork, approach road, Inspection Bungalows, checkdams, bandhara, T.R., weir, barrages, Flood Protection & Anti Sea Erosion work, canal lining and structures, , CD Works, structure repairing, Jungle cutting, Desilting, etc. other WRD works.

(B) Road Works:

~~Site clearance; setting out and layout widening of existing carriageway and strengthening including camber corrections; construction of new road/Parallel service road; bituminous pavements remodeling/construction of Junctions, intersections, bus bays, lay bays; supplying and placing of drainage Channels, flumes, guard posts and guard other related items; construction/extension of cross drainage works, bridge, approaches and other related stones; protective works for roads/bridge; all aspects of quality assurance of various components of the works; rectification of The defects in the completed works during the Defects Liability Period; submission of “As built” drawings and any other related documents; and other item of work as may be required to be carried out for completing the work in accordance with the drawings and the provisions of the contract and to ensure safety.~~

(C) Bridge Works

provision of foundations, piers, abutments and bearing; prestressed/reinforced cement concrete superstructure; wearing coat, handrailings, expansion joints, approach slabs, drainage spouts/downtake pipes, arrangements for fixing light posts, water mains, utilities etc; provision of suitably designed protective works; providing wing/return walls; provision of road markings, road signs etc.; all aspects of quality assurance; clearing the site and handing over the works on completion; rectification of the defects during the Defects Liability Period and submission of "As-built" drawings and other related documents; and other items of work as may be required to be carried out for completing the works in accordance with the drawings and the provision of the contract and to ensure safety

[CL.1.1]

(D) Other Items

- Any Other Items as required to fulfill all contractual obligations as per the Bid documents. [CL.2.3(9)]
10. The following documents also form part of the Contract:
_____ As per clause 2-3 _____
 11. The law which applies to the Contract is the law of Union of India [CL.3.1]
 12. The language of the Contract documents is English [CL.3.1]
 13. Limit of subcontracting _____ 25% of the Initial Contract Price _____ [CL.7.1]
 14. The Schedule of Other Contractors [CL.8]
 15. The Schedule of Key Personnel _____ As per Annex-II to Section I [CL.9]
 16. The minimum insurance cover for physical property, injury and death is Rs. 5 lakhs per occurrence with the number of occurrences limited to four. After each occurrence, the contractor will pay an additional premium necessary to make insurance valid for four occurrences always. [CL.13]
 17. Site Investigation report [CL.14]
 18. The Site Possession date shall be From the Date of Issue of Work order [CL.21]
 19. The period for submission of programme for approval of the engineers shall be 21 days from the issue of Letter of Acceptance. [CL.28.1]
 20. The period between program updates will be days. [CL.28.2]
 21. The amount to be withheld for late submission of an updated programme shall be Rs. lakhs [CL.28.3]
 22. The following events shall also be Compensation Events [CL.45]
Substantially adverse ground conditions encountered during the course of execution of work not provided for in the bidding document.
 - (i) Removal of underground utilities detected subsequently
 - (ii) Significant changes in classification of soil requiring additional mobilization by the contractor, e.g. ordinary soil or rock excavation,
 - (iii) Removal of unsuitable material like marsh, debris dumps, etc. not caused by the contractor.

- (iv) Artesian conditions
 - (v) Seepage, erosion landslide
 - (vi) River training requiring protection of permanent work
 - (vii) Presence of historical, archeological or religious structures, monuments interfering with the works
 - (viii) Restriction of access to ground imposed by civil, judicial, or military authority
23. The currency of the Contract is Indian Rupees [CL.47]
24. **The formula(e) for adjustment of prices are as under:** [CL.48]
- If any of the commodities like Cement, Steel or Bitumen are not found applicable in a work, the weight component of that commodities {i.e. 'Cement' (Pc), 'Steel' (Ps) or 'Bitumen' (Pb) as indicated in SBD for the purpose of Price Adjustment} shall be clubbed with the weight component of 'Other Material' (Pm), such that the gross % weight of the components shall remain as 100%.
- R = value of work as defined in Clause 47.1 of Conditions of Contract

Adjustment for labour component

(i)

Price adjustment for increase or decrease in the cost due to labour shall be paid in accordance with the following formula:

$$V_L = 0.85 \times (P_l / 100) \times R \times (L_i - L_0) / L_0$$

V_L = Increase or decrease in the cost of work during the month under consideration due to changes in rates for local labour

L_0 = The consumer price index for industrial workers for the State on 28 days preceding the scheduled date of opening of technical Bids as published by Labour Bureau, Ministry of Labour, Government of India

L_i = The consumer price index for industrial workers for the State for the month under consideration as published by the Labour Bureau, Ministry of Labour, Government of India.

P_l = Percentage of labor component of the work.

Adjustment for cement component.

(ii)

Price adjustment for increase or decrease in the cost of cement procured by the contractor

$$V_c = 0.85 \times (P_c / 100) \times R \times (C_i - C_0) / C_0$$

V_c = Increase or decrease in the cost of work during the month under consideration due to changes in rates for cement.

C_0 = The all India wholesale price index for Ordinary Portland Cement on 28 days preceding the scheduled date of opening of technical bids as published by the Office of the Economic Adviser, Department for Promotion of Industry and Internal Trade, Ministry of Commerce & Industry.

~~C_i=The all India average wholesale price index for Ordinary Portland Cement for the month under consideration as published by Office of the Economic Adviser, Department for Promotion of Industry and Internal Trade, Ministry of Commerce & Industry.~~

P_c=Percentage of cement component of the work

Adjustment for steel component

- (iii) Price adjustment for increase or decrease in the cost of steel procured by the contractor shall be paid in accordance with the following formula

$$V_s = 0.85 \times (P_s/100) \times R \times (S_i - S_0)/S_0$$

V_s=Increase or decrease in the cost of work during the month under consideration due to change in the rates for steel

S₀=The all India wholesale price index for steel (**Mild Steel-Long Products Rebars**) on 28 days preceding the date of opening of Bids as published by the **Office of the Economic Adviser, Department for Promotion of Industry and Internal Trade, Ministry of Commerce & Industry.**

S_i=The all India average wholesale price index for steel (**Mild Steel-Long Products Rebars**) for the month under consideration as published by **Office of the Economic Adviser, Department for Promotion of Industry and Internal Trade, Ministry of Commerce & Industry.**

P_s=Percentage of steel component of the work

Note : For the application of this clause, the index of **Mild Steel-Long products Rebar** has been chosen to represent the steel group.

Adjustment of bitumen component

- (iv) Price adjustment for increase in the cost of bitumen shall be paid in accordance with the following formula

$$V_b = 0.85 \times (P_b/100) \times R \times (B_i - B_0)/B_0$$

V_b=Increase or decrease in the cost of work during the month under consideration due to changes in rates for bitumen.

~~B₀= The official retail price of bitumen at the IOC depot at the nearest centre on the day 28 days prior to the scheduled date of opening of technical bid.~~

~~B_i=The official retail price of bitumen of IOC depot at the nearest centre for the 15th day of the month under consideration.~~

P_b=Percentage of bitumen component of the work

Adjustment of POL (fuel and lubricant) component

- (v) Price adjustment for increase or decrease in cost of POL (fuel and lubricant) shall be paid in accordance with the following formula

$$V_f = 0.85 \times (P_f/100) \times R \times (F_i - F_0)/F_0$$

V_f = Increase or decrease in the cost of work during the month under consideration due to changes in rates for fuel and lubricants.

F_0 = The official retail price of High Speed Diesel (HSD) at the existing consumer pumps of IOC at the nearest centre on the day 28 prior to the date of opening of Bids.

F_i = The official retail price of HSD at the existing consumer pumps of IOC at the nearest centre for the 15th day of the month of the under consideration.

P_f = Percentage of fuel and lubricants component of the work

Note: For the application of this clause, the price of High-Speed diesel Oil has been chosen to represent the fuel and lubricants group.

Adjustment for Construction Machinery

- (vi) Price adjustment for increase or decrease in the cost of plant and Machinery spares procured by the Contractor shall be paid in accordance with the following formula

$$V_p = 0.85 \times (P_p/100) \times R \times (P_i - P_0)/P_0$$

V_p = Increase or decrease in the cost of work during the month under consideration due to changes in rates for plant and machinery spares

P_0 = The all India wholesale price index for **manufacturer of machinery for mining, quarrying and Construction** for the month under consideration as published **Office of the Economic Adviser, Department for Promotion of Industry and Internal Trade, Ministry of Commerce & Industry.**

P_i = The all India average wholesale price index for **manufacturer of machinery for mining, quarrying and Construction** for the month under consideration as published **Office of the Economic Adviser, Department for Promotion of Industry and Internal Trade, Ministry of Commerce & Industry.**

P_p = Percentage of plant and machinery spares component of the work.

Note: For the application of this clause, index of Heavy Machinery and parts has been chosen to represent the Plant and Machinery Spares group

Adjustment of other materials Component

- (vii) Price adjustment for increase or decrease in cost of local materials other than cement, steel, bitumen and POL procured by the contractor shall be paid in accordance with the following formula

$$V_m = 0.85 \times (P_m / 100) \times R \times (M_i - M_0) / M_0$$

V_m = Increase or decrease in the cost of work during the month under consideration due to change in rates for local materials other than cement, steel, bitumen and POL.

M_0 = The All India wholesale price index (all commodities) on 28 days preceding the scheduled date of opening of technical Bids, as published by the **Office of the Economic Adviser, Department for Promotion of Industry and Internal Trade, Ministry of Commerce & Industry.**

M_i = The All India wholesale price index (all commodities) for the month under consideration as published by the **Office of the Economic Adviser, Department for Promotion of Industry and Internal Trade, Ministry of Commerce & Industry.**

P_m = Percentage of local material components (other than cement, steel, bitumen and POL) of the work.

The following percentage will govern the price adjustment for the entire contract:

1	Labour-P_l	27.09%
2	Cement-P_e	34.58%
3	Steel- P_s	20.39%
4	Bitumen-P_b	0.00%
5	POL-P_f	7.44%
6	Plant & Machinery Spares P_p	13.80%
7	Other Materials-P_m	31.28%
Total		100.00%

25. The proportion of payments retained (retention money) shall be 6% {CL. 49} from each bill subject to a maximum of 5% of final contract price.
26. Amount of Liquidated damages for {CL. 50} delay in completion of works
- For Whole of work
(1/2000)th of the Initial contract price, rounded off to the nearest Thousand, per day.

27. Maximum limit of liquidated damages for delay in completion work 10 percent of the Initial Contract Price rounded off to the nearest thousand {CL.50}

28. Amount of Bonus for early completion ~~Amount of bonus for early completion of work shall be given as per (CL.51 of Section 3)~~

29. Maximum limit of bonus for early completion of work ~~5 percent of the Contract Price~~ {CL.51} Co

30. The amount of the advance payment are: {CL.52 & 53}
#Nature of Advances

		Amount (Rs.) Condition to be fulfilled
i	Mobilization 10% of the contract	On submission of unconditional Price Bank Guarantee. (to be drawn before the end of 20% of the contract period). The contractor may furnish four bank guarantees of 2.5 % of each valid for the full period.
ii	Equipment 90% for new and 50% of depreciated value for old equipment. Total amount will be subject to a maximum of 5% of the Contract Price	After equipment is brought to site (provided the Engineer is satisfied that the equipment is required for performance of the contract) and on submission of unconditional Bank Guarantee for amount of advance
iii	Secured Advance for Non-perishable material Brought to site	Deleted

(The advance payment will be paid to the Contractor not later than 28 days after fulfillment of the above conditions).

31. ~~Repayment of advance payment for mobilization and equipment~~ {CL.52.3}

The advance loan shall be repaid with percentage deduction from the interim payments certified by the Engineer under the Contract. Deductions shall commence in the next Interim Payment Certificate following that in which the

~~total of all such payments to the Contractor has reached not less than 20 percent of the Contract Price or 6 (six) months from the date of payment of first installment of advance, whichever period concludes earlier, and shall be made at the rate of 20 percent (collectively for both Mobilization Advance and Equipment Advance) of the amount of all Interim Payment Certificate until such time as the loan has been repaid, always provided that the loan shall be completely repaid prior to the expiry of the original time for completion pursuant to Clause 17 and 28.~~

32. Deleted

33. The securities shall be for the following minimum amounts equivalent {CL. 53} As a percentage of the Contract Price:

Performance Security for 5 percent of contract price plus Rs. (to be decided after evaluation of the bid) as additional security in terms of ITB Clause 29.5

The standard form of Performance security acceptable to the Employer shall be an unconditional Bank Guarantee of the type as presented in Section 8 of the Bidding Documents.

34. ~~The Schedule of Operating and maintenance Manuals.....N/A.~~ {CL.59}

35. ~~The date by which “as built” drawings (in scale as directed) in 2 sets {CL. 60} are required within 28 days of the issue of certificate of completion of the whole or section of the work, as the case may be.~~

36. ~~The amount to be withheld for failing to supply “as built” drawings {CL.58} by the Date require is Rs..... Lakhs.~~

37. The following events shall also be fundamental breach of contract: {CL.59.2} “The Contractor has contravened Sub-clause 7.1 and Clause 9 of GCC”

38. The percentage to apply the value of the work not completed representing {CL. 60} the Employer’s additional cost for completing the Work shall be 20 per cent.

SECTION-5
TECHNICALSPECIFICATION

List of I. S. Code and Other Publication

1.0 Applicable Publications.

Generally, Bureau of Indian standard codes (latest version of I. S. code) shall be followed for all items of works, wherever such code does not exist, the reference shall be taken from other technical publications as directed by Engineer- In- Charge.

1.1 Indian Standards and Other Publications: (for Earthwork)

1	IS: 1498 -1970	Classification and identification of soils for general engineering purposes (first revision) (Amendment Nos.1 and 2)
2	IS: 2809 -1972	Glossary of terms and symbols relating to soil engineering (first revision).
3	IS: 3764 -1966	Safety code for excavation work (Amendment No. 1)
4	IS: 7293 -1974	Safety code for working with construction machinery.
5	IS: 1720 -1978 (Part I to xx)	Methods for testing of soils
6	IS: 2720 -1983 (Part - I to X & Part 14)	Methods of test for soils
7	IS: 1888 -1982	Methods of load test on soil (second revision)
8	IS: 2131 -1981	Method of standard penetration test for soils (first revision)
9	IS: 5529 -1985 (Part-I)	Test in overburden (first revision)
9.1	U.S.B.R. (United State Bureau of Reclamation)	Earth manual (Second edition 1974, reprinted 1985)
9.2	Central Water commission	Safety manual

1.2 Indian Standards and Other Publications: (for Concrete work)

1	IS :8112	Specification for 43 grade ordinary Portland cement (First revision)
2	IS :650	Specification for standard sand for testing of cement (First revision) (Amendment No.1,2&3)
3	IS :383	Specification for coarse & fine aggregate from natural sources for concrete (Second revision)
4	IS :2386 (Part I - VIII)	Method of test for aggregates for concrete.
5	IS :5640	Method of test for determining aggregated impact value of soft coarse aggregates.
6	IS :456	Code of practice for plain & reinforced concrete (Fourth revision)
7	IS :457	Code of practice for general construction of plain and reinforced concrete for dams & other massive structures.
8	IS :4926	Specification for ready mixed concrete (First revision)
9	IS :1199	Method of sampling and analysis of concrete.
10	IS :516	Method of test for strength of concrete (Amendment No.1)
11	IS :3085	Methods of test for permeability of cement, mortar and concrete.
12	IS:1791	Specification for batch type concrete mixers (Second revision)

13	IS :4634	Methods for testing performance of batch type concrete mixers.
14	IS :5892	Specification for concrete transit mixer and agitators.
15	IS: 6461 (Part I to XII)	Glossary of terms relating to cement concrete vibrators.
16	IS :2505	General requirement for concrete vibrators (immersion type) (Second revision)
17	IS :4656	Specification for form vibrators for concrete.
18	IS :5889	Specification for vibratory plate compactor.
19	IS :3558	Code of practice for use of immersion vibrators for consolidating concrete.
20	IS :5513	Specification for Vicat apparatus (First revision) (Amendment No.1)
21	IS :5515	Compacting factor apparatus (First revision)
22	IS :5529 (part I & II)	Code of practice for in-situ permeability test.
23	IS:5816	Method of test for splitting tensile strength of concrete cylinders. (First revision)
24	IS :7320	Specification for concrete slump test apparatus (Amendment No.1)
25	IS :9284	Method of test for abrasion resistance of concrete.
26	IS :8142	Method of test for determining setting time of concrete by penetration resistance.
27	IS :8989	Safety code for erection of concrete frame structures.
28	IS :303	Specification for plywood for general purposes (Second revision) (Amendment No.1 to4)
29	IS :883	Code of practice for design of structural timber in building (third revision)
30	IS :4990	Specification for plywood for concrete shuttering work (First revision (Amendment No.1)
31	SP:16 (S & T)	Design aids for reinforced concrete to IS: 456.
32	SP:23	Handbook for Concrete Mix.
33	IS:3370	Code of practice for concrete structures for the storage of liquids (part I to IV)

1.3 Indian Standards and Other Publications: (for Reinforcement / Steel work)

1	IS: 432 (Part-II)	Hard drawn steel wire (third revision)
2	IS: 1566	Specification for hard drawn steel wire fabric for concrete reinforcement. (second revision) (Amendment No.1)
3	IS: 1786	Specification for high yield strength deformed steel bars and wires for concrete reinforcement (third revision)
4	IS: 1139	Hot rolled mild steel, medium tensile steel and high yield strength steel deformed bars for concrete reinforcement.
5	IS: 1481	Metric steel scales for engineers (first revision) (with 2 Amendments)
6	IS: 2502	Code of practice for bending and fixing of bars for concrete reinforcement.
7	IS: 5525	Recommendations for detailing of reinforcement in reinforced concrete works.
8	IS: 1521	Method for tensile testing of steel wire (first revision)
9	IS: 1608	Method for tensile of steel products (first revision)
10	IS :9077	Code of practice for corrosion protection of steel reinforcement in RB and RCC construction.

11	IS:2062	Weld able Structural Steel (third revision)
12	IS: 2751	Recommended practice for welding of mild steel plain and deformed bars for reinforced construction (first revision)
13	IS: 9417	Recommendation for welding cold worked bar for reinforced concrete construction.
14	IS: 814	Covered electrodes for metal arc welding of structural steels.
15	IS: 814 (Part-I)	For welding products other than sheets (fourth revision) (with Amendment No. 1 to 3)
16	IS: 814 (Part-II)	For welding sheets (fourth revision)
17	IS: 1278	Filler rods & wires for gas welding (second revision) (with Amendment No.1)
18	IS :5242	Method of taste for determining shear strength of metal (first revision).
19	IS:800	For Structural Steel
20	IS :961	For Structural Steel
21	IS :1977	For Structural Steel
22	IS:2062	For Structural Steel
23	IS:816	For Welding work on Steel
24	IS:1477	For Paint on Steel

1.4 Indian Standards and Other Publications: (for other work)

1	IS:1542-1977	Specification for sand for plaster (first revision)
2	IS:2116-1980	Specification for sand for masonry mortar (first revision)
3	IS: 2250-1981	Code of practice for preparation and use of masonry mortar (first revision)
4	IS:1122-1974	Methods of test for determination of true specific gravity of natural building stone (first revision)
5	IS:1124-1974	Methods of test for determination of water absorption, apparent specific gravity and porosity of natural building stones (first revision)
6	IS:1125-1974	Methods of test for determination of weathering of natural building stones (first revision)
7	IS:1126-1974	Methods of test for determination of durability of natural building stones (first revision) (Amendment No.1)
8	IS: 3873-1993	Laying cement concrete slab, lining on canals – code of practice (second revision)

Signature of contractor

Executive Engineer
Dharoi Canal Division No.3
Visnagar

TECHNICAL SPECIFICATIONS

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I.GENERAL

- 1.0 The present tender cover the work of **Construction of Gabion Type protection wall at Sr. no. 4109 and 4120 on Pushpavati River at village Dasaj, Ta: Unjha, Dist: Mehsana**

The work site is located near **Village Dasaj, Ta-Unjha and Dist: -Mehsana. 200 mt. long Gabion wall with non-woven geo febric filter and required pilot cut of the flow of river to divert from bank of river etc. with items as per B.O.Q.**and direction of engineer-in-charge.

- 2.0 The work area is situated in relatively medium rainfall zone. The rainy season commence normally from the middle of June and lasts up to end of September. It has been observed that works are required to be totally closed in monsoon, but in part of it, can be continued with precaution in dry spells during monsoon. If during the monsoon breaks, the works are in progress, it shall be the responsibility of the contractor to preserve and maintain the safe condition of all materials, machinery, tools and work sites from the floods due to seasonal or unseasoned rains, cyclone etc. The damages to the work, plant, materials, machinery etc. shall be borne by the contractor without any claims. No payment shall be made for any part of earthwork or materials washed away or damaged during the monsoon or other period and it shall have to be made good by the contractor at his own cost. It is the responsibility of the contractor to make good or repair any Government property, material to be utilized for the present work or completed part of present work damaged during the construction period, before handing over the work to the department.
- 3.0 The Contractor shall make his own survey, arrangement for construction materials such like Cement, Fine aggregate, Coarse aggregate, Water, Steel, Murrum, Sand, etc. as per tender Specification.

The above information is given for general guidance to the contractor and it does not in any way limit the performance of work under this tender. The contractor shall have to make his own arrangement of the quality and the quantity of the construction materials along with the developing accessibility to the structures and its ancillary works, etc. Department does not bind itself to any conclusion or towards any conclusion that may be made by the contractor in this respect from this information and no claims on this account shall be entertained.

- 4.0 A motorable inspection road shall be maintained by contractor for inspection of the work during construction period. In working period, necessary temporary inspection facilities on site of work shall be also provide for the detailed inspection of the work. Proper diversion roads, for highway road traffic shall be maintained by the contractor with proper sign boards and red lights on entry and exist of the diversion etc. as directed by the Engineer - in - charge in during currency of the contract without any type extra payment.
- 5.0 The work in general shall be carried out in workmen like manner as well as to the correct section, better (side slope) and gradient as per drawing and to the entire satisfaction of the Engineer-in-charge or his authorized any representative. The various works shall be done true to line, level and grade. The periodical checking of these works by Government's staff shall not absolve the contractor of his responsibility regarding the accuracy. In case of any deviation or discrepancy in line, level or grade at the meeting faces, the contractor shall make good the

discrepancy at his own cost and without any extra compensation for the additional work involved. Whenever such a discrepancy is found to arise at the junction of works of different contractors, the responsibility to set right such discrepancy lies with the contractors concerned. The Engineer- in -charge shall further have the unquestioned right, if need be, to rectify the discrepancies and recover the costs from the contractor or contractors according to proportion as he may consider reasonable.

All work shall be carried out as per specification given in P.W.D. volume I & II and / or as per relevant latest I.S.I. standard and technical specification of contract document As Well As Contractor Shall Be Carried Out Work as Directed by Engineer-In Charge. The site shall be cleared of all rubbish material and heaps etc. and shall be handed over in neat and good condition after completion of the work.

The proposed methodology and program of construction including environmental management plan, backed with equipment planning and deployment, duly supported with broad calculations and quality control procedures proposed to be adopted, justifying their capability of execution and completion of the work as per technical specifications within the stipulated period of completion as per milestones.

6.0 TESTING OF MATERIALS:

- 6.1 All materials before being incorporated in the work shall be inspected and if necessary, tested before being approved by the Engineer-in-charge. Any work on which such materials are used without prior inspection (and when necessary prior testing) and without approval or written permission of the Engineer-in-charge may be considered as unauthorized, defective and not acceptable.
- 6.2 The day-to-day / periodical tests to be carried out on materials, mixes and placed concrete, concrete etc. shall be specified by the Engineer- in- charge or as per relevant IS from time to time for ensuring quality and workmanship. The contractor shall allow all facilities and co-operation towards collection of samples & testing procedure etc. The contractor shall supply necessary materials for testing at his own cost. Also, required labour for collecting samples of materials & transport facilities with loading, unloading to samples of materials from work site to field laboratory / Govt. laboratory / Govt. approved laboratory for tests, shall be supplied by contractor free of cost to department. Necessary arrangement for proper curing of cast specimen on work site & transport it from work site to laboratory shall be arranged by the contractor at his own cost.

The contractor shall supply necessary materials at testing laboratory for working out suitable Mix designs at his own cost. The methods of sampling and testing, the procedure and standards shall be as laid down by the Engineer-in-charge for the respective item as per relevant latest I.S.I. standard. ***All TYPES TESTING CHARGES WILL BE BORN BY THE GOVERNMENT AS PER NWRWS&K Department circular Misc/1097/1397/(11)/k-1 M.I.celldtd. 12/1/2013.***

- 6.3 The materials, mixes and placed concrete, concrete, cores etc. shall be tested day to day or

periodically at the Government Laboratory Or set up at the site of work by Contractor and In Supervision execution staff of department and the results given thereof shall be considered correct and authentic by the contractor. The contractor shall be given access to all operations / tests that may be carried out as aforesaid so that he may satisfy himself regarding the procedure and methods adopted. Maintaining quality of work shall be the fully responsibility of the contractor under supervision of execution staff of the work.

The contractor shall be established a laboratory with necessary required equipment with required facilities of light, water etc. at site of work at his own cost / expenses to carry out field test. The contractor shall be providing All Equipments for Testing of All Item of Works in Field Laboratory.

- 6.4 Contractor shall provide all the required testing Equipments including compressive strength testing machine at site such that 80% of the test shall be performed on site, 10% of test shall be performed in Govt. approved private laboratory and remaining 10 % test shall be carried out in GERI/Government Engineering college/Government Polytechnic, such that at least one test shall be conducted in GERI. All types testing And Mix Design charges will be BORN BY THE GOVERNMENT AS PER NWR&K Department circular Misc/1097/1397/ (11)/k-1 M.I. cell dtd. 12/1/2013.If Any New GR (for Testing) has been issued by The Department during the ongoing work the Contractor shall also consider it and Test Accordingly. The Material Test Which is Not Carried out By GERI, It Shall be Carried Out In Govt, Approved Lab Or Any Other Private Lab.
- ~~6.5 At least one mix design (1st Mix design after work order receive) of each grade shall be carried out in Geri. Mix design after change in season if required shall be carried out in Geri/Government approved Laboratory. Each mix design shall be approved by Engineer in charge.~~
- 6.6 The contractor shall submit the monthly schedule in advance for the work to be taken up during that month and which shall be approved by the Engineer –in –charge. The work shall be carried out in accordance with approved work schedule.
- 6.7 **Concrete work should be done with Nominal Mix or Mix design to maintain quality of concrete and for proper Control concrete mixing,** Contractor will have to set up a batching plant at site with a capacity of 30 cubic meters/hour at his own Cost, for that no separate payment will be made from the government and in any case, if rent/compensation is given to the farmers for setting up the batching plant, the same will have to be paid by the Contractor.
- 6.8 A Motorable inspection road shall be maintained by contractor for inspection of the work during construction period. In working period, necessary temporary inspection facilities on site of work shall be also provide for the detailed inspection of the work. Proper diversion roads, for highway road traffic shall be maintained by the contractor with proper sign boards on entry and exist of the diversion etc. as directed by the Engineer - in - charge in during currency of the contract without any type extra payment.

- 6.9. If any defect or discrepancy is found in the tender or tender specification, the decision of the Engineer In charge will be final.

Signature of contractor

**Executive Engineer
Dharoi Canal Division No.3
Visnagar**

II. TECHNICAL SPECIFICATION FOR MATERIALS

M – 1 FINE AGGREGATE (Sand):

- a. All the fine aggregates shall conform to IS: 383-1970 or its latest version and as directed by the Engineer-in-Charge. Sand to be used shall be natural as obtained from the river bed and the maximum size shall be limited to 4.75mm. The Sand shall be obtained from Sabarmati river bed or from any other suitable sources as approved by Engineer-in- charge.
- b. The sand shall consist of hard, dense, durable, uncoated siliceous gritty materials. It shall be free from injurious materials of dust, lumps, soft and flaky particles, shale, alkali-organic matter, loam, mica, earth, clay and other deleterious substances. The maximum size of sand particle shall be limited to 4.75mm. The F.M of the sand to be used in concrete / masonry shall be ranging in between **2 to 3.5**. The maximum percentage of each of the deleterious substances in sand as delivered to the mixer for use in concrete etc. shall not exceed the following values.

(a) Limits of deleterious materials.

Limits of Deleterious materials for Uncrushed Fine Aggregate (As per IS 383):

Sr. No.	Deleterious Substance	Fine Aggregate percentage by Weight, Max.
1	Coal and Lignite	1.0
2	Clay lumps	1.0
3	Materials finer than 75 micron IS Sieve	3.0
4	Soft Fragment	-
5	Shale	1.0
6	Total percentages of all deleterious materials	5.0

- c. Sand shall be free from injurious amount of organic impurities. Sand that are producing a color (obtained by dissolving 9 grams of chemically pure (c.p.) ferric chloride and 1grams of c.p. cobalt chloride in 100 ml of water to which one-third ml of hydro-chloric acid has been added) darken than the standard in the test (organic test) for organic impurities shall be rejected.
- 2.4 Fine aggregates shall be tested for their gradation, fineness modulus, specific gravity, water absorption, soundness, deleterious constituents, petrographic analysis and alkali aggregate reactivity.

The following testing frequencies shall be maintained for the same source of fine aggregates.

Sr. No.	Name of test	Minimum number of tests specified
1	Gradation	Daily one test
	For Fineness Modulus (F.M.)	If the variation of daily F.M.values is more than 0.1 then frequencies may be increased.
2	Silt Content	Daily one test
3	Moisture Content	Daily one test
4	Sp. Gravity & water absorption, Alkali-Aggregate Reactivity, Petrographic examination.	Twice in a concreting working season.

2.5 Due allowance shall be made if the sand is wet at the time of mixing, the exact extent of such allowance or bulkage shall depend upon the quantity of moisture in sand and it shall be decided by the Engineer-in-Charge.

2.6 Gradation:

- (a) Sand shall be well graded so as to impart good workability and good finishing. Sieve analysis of natural sand shall confirm to the following limits of gradation.

IS Sieve Designation	Percentage passing for			
	Grading Zone-I	Grading Zone-II	Grading Zone-III	Grading Zone-IV
10 mm	100	100	100	100
4.75 mm	90-100	90-100	90-100	95-100
2.36 mm	60-95	75-100	85-100	95-100
1.18 mm	30-70	55-90	75-100	90-100
600 micron	15-34	35-59	60-79	80-100
300 micron	5-20	8-30	12-40	15-50
150 micron	0-10	0-10	0-10	0-15

- (b) Deviations from the prescribed limits of cumulative percentage retained on 10mm, 4.75 mm, 2.36 mm, 1.18 mm, 600 micron, 300micron and 150 micron IS sieves shall be permitted provided total of such deviations do not exceed 5%.
- (c) No deviation from the prescribed limit shall be permitted for cumulative percentage passing through 600 micron IS Sieve.

Fineness Modules:

- (a) The sand shall have a fineness modulus ranging in between **2 to 3.5** subject to the gradation specified in the preceding paragraph.
- (b) The modules shall be computed by adding cumulative percentage of the sand retained on the

standard screen from 4.75 mm, 2.36mm, 1.18 mm, 600micron, 300 micron, 150 micron IS sieves (as M.T. standard screen from 3/16" and no. 480, 120, 60, 30, 15 sieve) and dividing the sum by 100. Gradation of sand shall be so controlled that the FM of at least 9 out of 10 consecutive test samples of finished and shall not vary more than 0.10 from the average 10 tests samples.

- (c) Any deviation from the specified range of gradation and fineness modules shall not be permitted to be used in work, without the written permission of the Engineer-in-charge. Any deviation from the specified range of the fineness modules will not be tested for clay, organic impurities and other deleterious substances as laid down in I.S. 383.
 - (d) Details regarding Fineness Modulus for sand available at different locations in river bed can be seen in the office of the **Executive Engineer Dharoi Canal Division No.3, Visnagar** It may be pointed out in particular that the large quantity of sand is available in river Sabarmati. The Contractor shall procure approved quality of sand from any other source if required at their own cost. The contractor shall procure approved quality of aggregates from any other sources for which no extra claim shall be entertained.
- 2.7 Frequency of test shall be as per table of para 2.4 / at change of source of fine aggregate / one test for each 150 cmt. of sand or part thereof.
- 2.8 Storage: - All sand shall be stored on the site of work in such a manner as to prevent intrusion of foreign matter.
- 2.9 Royalty: - The contractor shall be responsible for obeying the laws, rules and regulations imposed under the mines and minerals Act and such other laws and rules prescribed by Government Departments such as forest, revenue or any other competent authority. The contractor subject to general conditions of contract shall pay local authorities, royalty etc. payable for securing the material.

Where rules permit refund of royalty for use of the materials in Government work the engineer will pass a certificate for the quantity so uses.

M- 2 RUBBLE / STONE: -

The stone shall be of the specified variation such as Granite / Trap stone / quartzite or any othertype of good hard stones. The stones shall be obtained onlyfromtheapprovedquarryandshallbehard,sound,durableandfreefrom defectslikecavities,cracks,sandandholes,flakes,injuriousveinspatchesof loose or soft materials to and weathered portions and other structural defect or imperfections tending to affect their soundness and strengths. The stone with round, surface shall not be used. The percentage of water absorption shallnotbemorethan5%ofdryweight,whentestedinaccordancewithI.S. 1121:1974. The minimum crushing strength of the stone to be used shall be 105-kg/sq.cm unless otherwise specified.

Thesamplesofthestonetobeusedshallbegotapprovedbeforetheworkis started.Thekhankifacingstoneshallbedressedbychiselaspecifiedinthe item forKhanki facing in required

shape and size. The face of stone shall be so dressed that the bushing on the exposed faces shall not project by more than 40 mm from the general wall surface and as face to be plastered it shall not project by more than 19 mm nor shall it have depressions more than 10 mm from the average wall surface.

All stones to be used on the work under the specification should be obtained from quarries approved by the Engineer in charge and shall be sound, hard, tough, compact, grained and uniform in texture and colour and free from decay, vein, flaws, cracks and sand hole etc. Stone with stained surfaces shall be allowed in the masonry such stones shall mean oxide containing which can be washed off, or removed by wet scrubbing.

Weathered skin maximum up to 1.5 mm. thickness shall be allowed on only one face of stones, which shall form not more than 33% of total number of stones used in the masonry such stones with skin on one face shall be stacked separately, water absorption of stone should not exceed as specified I.S.: 1124-1974 after being kept under water 24 hours. The stones shall be such as will not absorb more than a quarter percentage of water by weight. The rubble to be used in the masonry shall be quarried from quarry approved by the Engineer-in-Charge.

If the hardness and durability of stone could not be judged by appearance and the durability test should be conducted in Govt. Approved Lab. / G.E.R.I. well in time to avoid delay in carrying out the work of masonry.

The contractor shall use stones obtained from excavation, which the Engineer-in-Charge may direct and approve. After use of such stone the remaining requirements shall be brought from the quarry. The contractor shall pay to the Government for the stone obtained from excavation at used at rate shown in Schedule 'A'. Which is inclusive of royalty based on cross stake measurements if available from excavation. The selection and sorting of rubble shall be done according to the direction of the Engineer-in-Charge free of cost by the contractor.

STONE SIZE:-

The dimension of the stone to be used shall not be less than 15 CM. on any face. The length of stone shall not exceed three times its height and the breadth on bases shall not be greater than three-fourth of the thickness of wall not less than 15 cm. Minimum crushing strength of stones shall not be less than 105 kg/sq.cm.

The stone otherwise weight that labours can lift them or shall be as per Engineer-in-charge's direction. Stone and spalls shall be stacked separately as directed by the Engineer-in-charge. Percentage of spalls shall not be more than 16% of stones by volume.

FACE STONE:-

The face stone whenever required shall be selected from the mass of quarry stones of greater size, good, and uniform colour and shall be laid as far as possible without pinning in front. They shall tail back and bind wall in the work and shall not be of greater height than either breadth on the face or length of tail in the work. No face stone shall be less than 0.015 cubic

meter (1/2Cft.).Thefacestoneshallbe20Cm.to30Cm.inheight.Theyshallbe practically square on face and the exposed face shall be remove unevenness projecting of more than 4 cm.

BACKINGSTONE:-

A fair proportion of the stone used in the backing shall be of a large size thirty percent of them shall exceed 0.015 cubic meter. (half a cubic feet) in content.

QUOINS:-

Thequoinsunlessotherwise specifiedshallbeselectedstonenearlydressed withhammerorchiseltofromtherequiredangleandlaidheaderandstretcher alternatively.Noquoinstoneshalllessthan0.30cubicmeter(onecubicfoot) in content.

DRESSINGOFSTONES:-

The stone shall be set in the work as recovered from quarry after knocking offweakcornersandedgeswithamassivehammerandaftercleaningscales of foreign matter if any.No face stone shall be less in breadth than height or shalltailintotheworktoalengthlessthantheheightandheaderstonehaving lengthofabout3timestoitsheight.Thesestonesshallhavestarmarkforeasy identification and shall tail into the work in each course at every twometer length.

FILLING:-

Facestoneshallbelaidwithoutanypinningonthesurfaceandshallbefitted soastoformneatandclosejoints.Ifnecessarytheedgesshallbehammered to ensureclosejointed work,care shallbetakento ensurethatthefacework is bonded well in to the masonry.

BONDSTONES:-

For good, bond stones having a tail of not less than 45 cm. shall be used at therateofoneinonepersquareyard (squaremeter)ofthefaceworkexcept where the header stones themselves tail in to masonry by more than 30 Cm. to 45 Cm. or as directed by the Engineer-in-charge.

M-3 Double Twisted Hexagonal Zn +PVC Coated Wire Mesh for Gabions:

- 1) **Definitions of Terms Specific to this Standard: (As Per IS Code 16014 & Revised version)**
 - a. **Gabion** – A mechanically woven, double Twisted, hexagonal shaped steel wire mesh cage of variable sizes, uniformly partitioned by providing Diaphragms at every 1 m interval along the length, inter-connected with other similar units, and filled with stones of appropriate sizes and shapes at the site of form flexible, permeable monolithic structures such as retaining walls, slope protection structure, erosion and scour protection measures, various types of Hydraulic structures for river and channel protection like barrages, check dams, groynes, channel lining etc.
 - b. **Double-twisted wire mesh** – A non – raveling mesh manufactured by twisting continuous pairs of wires through three one-half turns (commonly called double-twisted) to form hexagonal shaped mesh openings which are then interconnected to adjacent wires to form hexagonal meshes.

- c. **Selvedge wire** – A terminal wire used to edge the wire mesh perpendicular to the double twist by mechanically wrapping the mesh wires around it at least 2.5 times.
- d. **Edge wire** – A terminal wire of the same diameter as the selvedge wire used to edge the wire mesh parallel to the double twist by continuously weaving it mechanically into the wire mesh.
- e. **Lacing wire** – A galvanized wire or galvanized wire with PVC coating used to assemble and interconnect empty units, to close and secure stone-filled units, and for internal stiffeners.
- f. **Stiffener** – A length of galvanized wire or galvanized wire with PVC coating used for support of facing by connecting the front panel to the back panel of a gabion and having the same diameter as the lacing wire.

2) Material and manufacture

- The wire used in the manufacture of double twisted mesh for use in gabions shall conform to the specification given below.
- Double - twisted mesh shall be manufactured from the same type of galvanized steel wire as style 1 with an additional PVC coating extruded on to the galvanized steel wire. The PVC coating shall conform to the properties given below.
- Lacing wire and stiffeners shall be made of wire having the same coating materials as the double twisted wire mesh furnished on the order and confirming to specification ASTM A 641, with a tensile strength in accordance with details given below.
- Gabions shall be manufactured with all components mechanically connected at the production facility with the exception of the mattress lid, which is produced separately from the base. All gabions shall be supplied in the collapsed form, either folded and bundled or rolled for shipping.

3) Mechanical Properties

- a. **Tensile Strength** – The tensile strength of wire used for mechanically woven, double-twisted hexagonal shaped mesh, lacing wire, and stiffener, when tested shall be in accordance with the requirements of IS 280 for soft wire (350-550 MPa) at minimum elongation of 10% , Performed on a gauge length of test specimen as 200 mm. (as per IS code 16014:2012.).
- b. **Tensile strength of Mesh Panel** – The minimum tensile strength of the Mesh panel must be **32 kN/m** in the parallel to twist direction. (as per table-4 of IS code 16014:2012.)

4) Physical Properties

- a. **Zinc Coating** – Zinc Coating – The coating weights shall be Heavily Galvanized conforming to the requirements of specifications ASTM A 641.
- b. **Adhesion of Zinc Coating** – No flakes shall be observed while testing for adhesion of Zinc coating as per ASTM A 641.

5) Specifications and Standards

The specifications and standards followed are as per Table 4 on next page.

Table – 4 Mesh, Wire and PVC coating Characteristics

Mesh Type	10 x 12	Specifications
Mesh Opening 'D' mm	100	EN10223
Mesh Tolerance	+16% to -4%	EN10223
Unit Dimensions	L x W x H	
Tolerances in sizes of units	L&W +/-5%: H < =0.3 m +/-10%: H > 0.3 m +/-5%	ASTM A975
Characteristics	Only Zn + PVC coated	
Mesh Wire Dia mm	2.7/3.7 (I.D./O.D)	EN10223
Tolerance (+/-) mm	0.08	BS1052
Zn Coating Min (gsm)	240	ASTM A641
Selvedge/Edge Wire Dia mm	3.4/4.4 (I.D./O.D)	EN10223
Tolerance (+/-) mm	0.10	BS1052
Zn Coating Min (gsm)	260	ASTM A 641
Lacing Wire Dia mm	2.2 / 3.2 (I.D./O.D)	
Tolerance (+/-)	0.06	BS1052
Zn Coating Min (gsm)	220	ASTM A 641
PVC coating		
Thickness Nominal (mm)	0.50	ASTM A 975
Thickness Minimum (mm)	0.38	ASTM A 975
Hardness	Between 50-60 Shore D	ASTM D 2240
Colour	Grey RAL 7037	ASTM D 1482
Tensile Strength	Min. 20.6 MPa	ASTM D 412
Specific Gravity	1.3 to 1.35	ASTM D 792

M-4 SELECTED EARTH:

- The selected earth shall be that obtained excavated material or shall have to be brought from outside as indicated in the item. If item does not indicate anything, the selected earth shall have to be brought from outside.
- In no case black cotton soil or similar expansive and shrinkable soil shall be used. It shall be clean and free from all rubbish and perishable materials, stones or brick bats. The clods shall be broken to a size of 50 mm or less. The stacking of material shall be done as directed by the Engineer in charge in such a way as not to interfere with any constructional activities and in proper stacks. When excavated material is to be used, only selected stuff got approved from the Engineer in charge shall be used. It shall be stacked separately and shall comply with all requirements of selected earth mentioned above.

M - 5 WATER:

- 4.1 Water used for mixing of concrete and concrete shall be clean and free from injurious amounts of deleterious materials, objectional quantity of silt and tracks of oil and injurious alkalis, salts, organic metals and other deleterious metals, which will either weaken the concrete or concrete or cause effloresces or attached the steel in R.C.C. It shall be free from elements which significantly affect hydration, reaction or other unsightly deposits on concrete or concrete surface. Water shall not be salty. Water should not be too acidic or too alkaline (if tested by litmus paper, repaid change of the litmus papers indicates dangerous amount of acid or alkali present).
- 4.2 The sample of water taken for testing shall represent the water proposed to be used for concreting, due account being paid to seasonal variation. The sample shall not receive any treatment before testing other than that envisaged in the regular supply of water proposed for use in concrete. The sample shall be stored in a clean container previously rinsed out with similar water. Frequency of test shall be one test per working season / on change of source of water / as directed by Engineer- in -charge as required. Container for transport and storage of the water shall be reasonable clean.

In case of doubt regarding development of strength of concrete, the suitability of water for making concrete shall be ascertained by obtaining the compressive strength of concrete and initial setting time of cement, which is compared by making concrete with distilled water.

Potable water is generally considered satisfactory for mixing and curing. The pH value of water should be in between 6.0 to 8.0. The turbidity in the water shall not be exceed 2000 ppm and shall be preferably a low as possible. The water shall be odorless & colorless. Hard and bitter water shall not be used for curing of work.

Where water is found to contain any sugar or an excess of acid, alkali or salt, the Engineer-in-charge will refuse to permit its use. As a guidance, the following table represents the maximum permissible values.

contain	Permissible limit (maximum) (mg/l = ppm)
Organic	200 mg/l
Inorganic	3000 mg/l
Sulphate (as SO ₃)	400 mg/l
Chlorides (as CL)	2000 mg/l for concrete not containing embedded steel(P.C.C.) & 500 mg/l for reinforced concrete work. (R.C.C.)
Suspend matter	2000 mg/l
Fluoride	1 mg/l

M - 6 Non-woven Geo Fabric Filter:

The Geo fabric filter shall be of good quality and confirm the following specification. Geofabric filters shall be polypropylene, nonwoven fabric. The Geo fabric should have dimensional stability. It shall be ideal for drainage

and filtration function. GWF shall be resistant to ultraviolet degradation and to biological and chemical environments normally found in soils. The material shall have the following physical properties.

POLYMER COMPOSITION: POLYPROPYLENE

Property / Test method		Test Method	Unit	Value	Tolerance
Weight		(EN965)	g/m ²	235	+/-10%
Thickness under 2kpa		(EN964/1)	Mm	1.7	+/-20%
Tensile strength	MD	(EN ISO 10319)	KN/m	18	-13%
	CD			18	-/+13%
Elongation at break	MD	(EN ISO 10319)	%	50	-/+23%
	CD			50	
Static puncture resistance CRR		(EN ISO 12236)		3000	-20%
Dynamic cone drop		(EN918)	N	19	+20%
Protection efficiency		WI189066	Mn	220	-20%
Characteristic opening size		(EN ISO 12965)	Um	90	+/-30%
Permeability		(EN ISO 11027.65)	m/s	85x10 ³	-30%
Water flow normal to the plane		(EN ISO 11027.65)	l/m ² /s	85	-30%
Water flow in plane 20		(EN ISO 11927.65)	M ² /s	7x10 ⁸	-10% log
Width			Cm	525	+/-5cm
length			m	100	+/-0.5m

3. The manufacture of geo fabric filter shall be ISO-2000 certified. The manufacturer must have an on-house laboratory facility for carrying out all tests specified.
4. The contractor should submit Geo-Fabric filter together with manufacturers test certificate for evaluation by engineer-in-charge. After the specimen of geo fabric sent by the contractor is found satisfactory, contract shall place order for manufacturing of Geo fabric filter with approved manufacturer.
5. The contractor will submit manufacturers test certificate for every 20 Rolls purchased for the project.

6. Geo Fabric filter shall be tested before shipment to confirm the requirement laid and cost of such testing at the Government laboratory or at the laboratory approved by Engineer in charge shall be borne by the Govt.
7. Before laying geo fabric filter it shall be got approved from the Engineer in charge.
8. Surface shall be first dressed and well prepared before filling the layer of sand. Fine aggregate shall conform with I.S. specification. The geo fabric filter shall be laid as shown on drawing or as directed by Engineer in charge after spreading 20 cm thick layer of sand, trimming, ramming and dressing the ground or bed directed by the Engineer in charge. The geo fabric filter with minimum width 4.0 m shall be used in order to minimize the joints.
9. At longitudinal and transverse joint, geo fabric filters shall be laid with overlap of 15 cm and joint should be double chain stitched by suitable machine using 1700 denier pp yam with minimum 9 kg breaking strength.
10. The geo fabric filters shall be spread in position without any wrinkles and care shall be taken so as to avoid any damage to it, after spreading. To keep the geo-fabric filter in desired position it shall be kept duly stretched until the same is covered by filter layer.
11. Any loss or and damage geo fabric filter due to any natural causes shall be made good and remedied by the contractor at this risk and cost to the satisfaction of engineer in charge. Any damage to geo fabric filter caused during the execution of this item shall be made good and remedied by the contractor at his risk and cost to the satisfaction of Engineer in charge.

Signature of contractor

Executive Engineer
Dharoi Canal Division No.3
Visnagar

EARTH WORK

1.0 EARTH WORK

- 1.1 Earthwork shall consist of carrying out excavation of foundation trenches, conveyance and deposition of the excavated stuff for preparing embankments or in spoil banks, repairing embankment by obtaining materials from borrow pits and compacting the embankment it also includes formation of catch water drains and gutters, excavating diversion of drains crossing the canal and excavating or making embankments for road bridges on canal.

1.2 SITE CLEARANCE:

- 1.2.1 All areas required for construction including seats of embankment and the surface of borrow pits shall be cleared of all trees with girth up to 60 cm. i.e. hedges stumps, roots, bushes, weeds, grass and other objectionable materials. The hedges shall be cleared in the complete boundary of the canal land width. The roots shall be thoroughly garbled up loose stones and rubbish shall be removed from the surface to be covered by new earth and deposited outside the toe from a near bund or deposited as directed by the Engineer-in-charge. After the bank area is cleared, it shall be ploughed or harvested to loosen the existing top so as to have sufficient bond, with the new earthwork. All the holes and hollow in the seat of embankment shall carefully filled in with earth well rammed and leveled off.
- 1.2.2 All the materials obtained from site clearance shall be removed from site so as not to interfere in the construction, operation and maintenance of the project. These materials shall be the property of Government and shall be disposed off in a manner specified by the Engineer-in-charge.
- 1.2.3 Unless otherwise explicitly, provided for the work of clearing site as given above shall be considered as included in the items of excavation and of making banks. However, where trees greater than 60 cm in girth are required to be removed or stripping of borrow area or of the seat of embankment is considered necessary these shall be done by department or other agency fixed by department.

1.3 EXCAVATION CLASSIFICATION:

In soil excavation of canal is classified as under Section IV. This shall include soil, soft, sand, gravel, silt murrum, clay, kankar and other soft material which can be easily excavated by means of pick and shovel loose stones less than 0.03 mt cube which do not required breaking up shall be treated as soil.

1.4 DEFINATION OF LEADS AND LIFTS, DEPTH SLABS AND HEIGHTSLABS:

- 1.4.1 Leads specified in any items of canal excavation shall mean the longitudinal distance along the canal bank line parallel to the center line of the canal and across canal lead for canal earth work in embankment by obtaining earth from borrow pits shall mean the distance as the crow flies between the weighted centre of gravity of the place of embankment to the centre of gravity of the

place of borrowing for that particular embankment chainages of a particular section of the canal for computation of lead shall be fixed by the Engineer-in-charge.

- 1.4.2** Depth slab in the item of excavation indicates the range of depth measured, from mean ground level of the cross section. Height slab in the item of embankment indicates the range of height measured, from mean ground level at the cross section.

1.5 LINE OUT:

- 1.5.1 The work shall be allowed to commence unless line out is given and the profiles are created by the contractor and got approved by the Engineer-in-charge. The profiles shall be fixed at every 30 m. or closer interval along the length of canal and maintained undisturbed till the work is completed and final measurements are taken.

- 1.5.2 For the length in full banking or partial banking, the inner top edges of the banks shall from straight lines parallel to and equal distance from the centre line the distance being as per designs or as directed by the Engineer-in-charge. For the lengths in spoils banks, the inner top edges of the spoil banks shall be in straight line for reasonable lengths as directed by the Engineer. Tops of the spoils will have fairly uniform level and they shall be smoothened at top with a slope away the canal centre line.

- 1.5.3 Suitable gaps at an interval of 300 mt. less shall be left in the spoil banks to allow for efficient drainage of the rain water from the canal limits to the outside as directed by the Engineer. At all the crossing of the canal, village cart track, roads, drains bridge the length as directed or ordered by the Engineers shall be left unexcavated which shall however excavate before completion of work.

1.5.4 METHOD OF ERECTION OF PROFILES:

The peg shall be fixed at every 30 M or closer interval along the length of canal as under. Reference peg 5 Cm. dia and 15 Cm. long shall be fixed on either side equal distance from the centerline canal. The distance shall be kept constant for a reasonable length any 150 M. or so. In portions of partial cutting and partial embankments, the position of these pegs shall be selected so that they will not get buried in embankment or obstruct in the way for consolidation. One peg 5 cm dia. and 30 cm. long shall be fixed to mark each of the toes (inner and outer) of spoil banks and embankment on either side.

- 1.5.4.1 Bamboos shall be erected below the top edges of embankment and spoil banks and profiles to mark shapes of the embankment or spoils; marking shall be done by coir strings tied to pegs and in proper elevation in bamboos. Nails shall be fixed to bamboos or any other arrangement shall be made to ensure the string shall not slide down and shall remain in their correct position. The bamboos shall be straight and the same shall be erected exactly vertical.

- 1.5.4.2 The pegs and profiles shall have to be fixed and maintained undisturbed till the work is completed and final measurement are taken.

- 1.5.4.3 The contractor shall provide necessary materials and labour and mark all necessary arrangement to install substantial reference points, bench marks etc. at his own cost and maintain them during the construction period.
- 1.5.4.4 For lengths in full banking or partial banking the inner top edges of the banks shall from a straight line parallel to get line out form the Engineer-in-charge it is tail be the responsibility and at equidistance from the centre line, the distance being as per design or as directed by the Engineer-in-charge. For the lengths in spoil banks the inner top edges of spoil banks shall be in straight line for reasonable lengths as directed by the Executive Engineer. Top of spoil banks will have fairly uniform level and they shall be smoothened at top with slope away from the canal centre line. All arrangement for supply of materials & laboures. for giving line out, setting profiles& taking levels during course of work shall be made by contractor at his cost.

1.6 EXCAVATION AND DEPOSITING EXCAVATED MATERIALS:

- 1.6.1 The excavation shall be carried out to the exact lines and levels as specified in the drawing or as directed by the Engineer. Any extra excavation beyond such line and levels shall not be measured and paid for. Also, the shallow has to be filled back by the contractor at his cost, in a manner as directed by the Engineer.
- 1.6.2 The section of canals including inner slopes forms etc. as shown in tendered drawings are tentative & are subject to modification as & when required during currency of contract. The work shall have to be executed accordingly without any extra cost /claims on the ground of modified drawings except for any excess or saving in tendered Qty. Which can be considered under provision of clause-57 of the"condition of the contract".The rate for Excess/ Saving shall be governed as perclause-57.
- 1.6.3 No extra payment shall be made for slips etc., and the same shall have to be restored by the contractor at his cost.
- 1.6.4 The excavated materials shall be deposited either in canal embankment or in spoil banks as directed by the Engineer-in-charge in uniform layers.
- 1.6.5 From deep cutting the excavated stuff will be deposited in spoil bank up to 150 Meter lead but the contractor will be allowed to deposit such stuff inner by motor, nala depressions Waste Govt. Indian land, if it is possible without any additional cost and there is no hindrance of will cause any damage to the concerned.
- 1.6.6 The excavated stuff inspires banks shall be so deposited as not obstruct to any roads, tracks or natural drainage and not to interfere with the construction and operation maintenance of the work.
- 1.6.7 The material obtained from excavation i.e. soft rock & hard rock shall be sorted cut to separate the materials which can be used in embankment rubber. The useful material as approved by the Engineer shall be utilized in embankment rubble & spauls obtained from excavation shall be properly stacked in measurable about as directed without any extra cost. The rest shall be wasted in spoil bank.

1.6.8 The excavated material if formed to contain material suitable for service road surface or for manufacture of soil cement bricks shall be avoided in using in canal banks and shall be stacked separately.

1.6.9 The contractor shall not damage any Govt. or private property during construction and if it is damaged the contractor shall repair the same at his own cost. The contractor shall be fully responsible for taking precaution for protecting the communication systems, drainage and water supply line and shall provide required supports during constructions. In case of damage the same shall be repaired at the cost of contractor. Any claims compensation due to such incidents shall be borne by the contractor. The contractor shall ensure that the private pipelines of farmers are not damaged during the construction and if damaged the same are to be restored at the risk and cost of the contractor.

1.7 MATERIALS FOR BANK WORK:

1.7.1 Only after all the useful and acceptable materials from excavation of canal is used up in bank work provided in specification the contractor shall obtain remaining material if any required for bank from borrow pits with lead as directed.

1.7.2 When the Engineer decides to use the excavated materials in a particular section if surplus beyond the specified distances, (Para 1.5.1) he shall direct to do so by a written order and the contractor shall use the same for bank work with an extra lead.

1.7.3 Earth to be deposited in embankment, whether obtained from excavation of canal or from borrow pits, shall be free from roots, stamps, pieces of wood rubbish vegetation, lump or any other organic, materials and such other materials as will affect the stability of the embankment. Stone larger than 10 cm diameter shall be executed from earth and all clods and lumps shall be broken down to 5 cm before the material is deposited in embankment. Only such material as found suitable by the Engineer for bank work shall not be used in bank work Unsuitable materials from canal excavation shall not be used in canal bank similarly unsuitable materials shall be removed by contractor without extra cost. No payment for such canal bank built by unsuitable materials such unsuitable Qty. not allowed for bank shall be measured & kept on authorized record.

1.8 BORROW PITS:

1.8.1 The contractor shall obtain materials only from the borrow pits allotted in departmental land in case the contractor brings materials from private lands, he shall bear all costard consequences and shall identify the department against any claims that maybe preferred by such land owners in this respect.

1.8.2 The borrow pits shall be located as shown on approved typical cross sections of the canal or as directed by the Engineer within the specified lead as per Para 1.4.1. The Borrow pits shall be regular in shape and shall not as rule be deeper than 2.5 m. They shall be excavated with suitable steps or side slopes to avoid slips. If the borrow pits are excavated to depth greater than those specified on plan or as directed by the Engineer the same shall

be refilling by the contractor and no extra payment shall be made for such refilling that may have to be carried out.

- 1.8.3 Ridges not less than 3 m wide shall be left at intervals not exceeding 30 m drains shall be out through such ridges to facilitate drainage payments for cutting such drains shall not be made. However, the excavation required if any from the last borrow pits to the natural drainage channels as may be directed by the Engineer shall be paid under relevant items of excavation to prevent stagnation of water the borrow pits shall above progressively towards the natural drainage channel. All borrow pit shall be joined so as to drain away water accumulated in its suitable link channel as allow shall be made to drain away water in natural drain. The inner slope of the canal shall be compacted by hand rammer and trimmed to the required section.

1.9 EMBANKMENT:

- 1.9.1 Earth in canal embankment shall be spread in successive horizontal layers not exceeding 23 cm in depth in full width of embankment at respective level. The earthwork shall be compacted by hand rammer.
- 1.9.2 The heights of embankment shall include a suitable allowance for settlement. The base width, however shall not be increased by a steeper slope to this extent shall be allowed. Allowance for settlement in various bank materials shall be decided by the Engineer-in-charge.

1.10 PROTECTIONS TO EARTH WORK:

- 1.10.1 Care shall be taken to ensure that the method of operation and raising of earth work does not cause any damage or under strain on any adjoining structures. Earthwork over and around structure shall be carried out with special care with specially selected and approved materials. The contractor shall take all precautions necessary for the protection of bank work by diversion of streams, local surface drainage, rain water etc. Likely to damage the work. Any damage caused to earthwork, due to any reasons whatsoever, shall be made good by the contractor *at* his own cost, till the work is certified as completed.

1.11 FINISHING:

- 1.11.1 This includes removal of palsies, Dearne, step etc. that may have left or provided during construction. The finished section shall be as smooth as possible and shall be dressed neatly to conformation the alignment, line, dimensions and slopes as shown on the drawings or as directed by the Engineer unevenness shall not exceed the limits specified in Para 1.11.2

1.11.2 LIMITS OF TOLERANCE:

- 1 Width of canal at bed +1 % subject to a max at F.S.L of ± 3 cm
- 2 Canal bed level ± 3 cm

3 Embankment top level ± 6 cm

In case of undercut or less in embankment work, the payment will be made on the actual section executed. In case of overcut or larger embankment work, payment will be made as per design section of the section as directed by the Engineer to be executed. In no case undercut or lesser embankment will permit and agency shall bear all expenditure required to be incurred by the department for bring under out or lesser embankment to the designed section.

1.12 MODE OF MEASUREMENT AND PAYMENT:

1.12.1 The line out shall be given by the Engineer-in-charge or his authorized representative.

1.12.2 The Quantity of excavation and compaction obtained as above shall be 5% deduction. For the running bills in case of tape measurement. The quantity of earth work for so worked out following deduction shall be made to have the equivalent standard compacted quantity of earth work for bank.

DEDUCTION:				
Name of Bank Work		Percentage to be deducted when		
		Measurement of compacted bank are taken		
Before Monsoon	After One Monsoon	After Two Monsoon		
1	2	3	4	
1. Compacted an optimum moisture content to specified dry density.	0	0		
2. Compacted with light rolling without artificial watering	10	5	0	
3. Not Compacted and no Watering	15	10	5	

1.12.3 The Running Bill Payment Made on Tape Measurement basis on cmt. Part Payment Made of 80% on Running Bill after All Compacted in All respect the measurement Shall be taken on L.S. CS Basis Full Payment

1.12.4 The final measurement shall be taken at an interval of every 30 meter along the canal with levels. Based on those levels cross section of canal shall be plotted & the Qty. shall be worked out on cross section bases. The levels for C.S. shall be taken in presence of contractor or his authorized representative. The levels and C.S plotted shall be signed by the contractor in acceptance of the measurements. The qty shall be worked out on C.S. area & distance between C.S. by simple rule of average. When surplus excavated material is ordered to be placed within the Specified extra lead. No separate measurement shall be taken for the item or extra lead. Those shall be derived from the measurement of embankment and of canal excavated and the surplus excavated shall be considered as utilized within the extra lead up to 150 meter till surplus quantity is accorded for.

1.12.5 The Unit Considering of CMT Basis.

Signature of contractor

**Executive Engineer
Dharoi Canal Division No.3
Visnagar**

IV. Excavation

The item shall include excavation in wet, dry or slushy condition and removal of excavated materials and their stacking and disposal in a manner as per instructions as directed.

1.0 GENERAL REQUIREMENT

The contractor shall provide materials and labour necessary for execution and completion of the work in accordance with drawings and specifications.

The contractor shall provide necessary protective measures for labour, materials and equipment to ensure safety against risk and accident. The contractor shall be liable to pay compensation for injury to life and damage to property if any caused due to any operation connected with the items.

The contractor shall hand over the site of work in neat and tidy condition and shall remove all wastage arising from construction.

2.0 CLEARING THE SITE

The contractor shall clear the entire area required for the structure canal and shall remove all the traces, stumps, roots, bush wood, rubbish of all kinds, loose stones and all other objectionable materials. The contractor shall dispose of useless materials by burning or as ordered by the Engineer-in-Charge and convey the remaining materials and stack property within the lead specified in the items. The Government shall remain owner of all the materials so obtained. The contractor shall be responsible for safe guarding the area where debris is to be burnt.

3.0 SETTING OUT

The contractor shall provide necessary materials and labour and make all necessary arrangements to get line out from the Engineer-in-charge or his authorized representative. It shall be the responsibility of the contractor to install substance reference points, bench marks etc. at his own cost and maintain them during the construction period.

4.0 EXCAVATION

The contractor shall perform all Excavation in accordance with line, levels, width and depth is shown on the plan if the Execution of competent authority decided to take the foundation lower than the foundation level shown on the plan the same will have to be done by the contractor at the same rate quoted by him for the item if the last depth slab does not change and unless there is a change in strata for which rates as per corresponding item shall be paid if the excavation is to be carried out beyond the last depth slab of the item for which rate is quoted in tender, the rate for the year in which tender was accepted. The percentage above or below of the accepted tender shall also be applicable to these rates. The contractor

shall have to present a clean, even and dry surface for the foundation to the satisfaction of the Engineer-in-charge for passing.

5.0 EXCESS EXCAVATION

The excavation beyond the lines and levels specified on plan shall not be measured and paid for unless it is ordered by the Engineer-in-charge in writing. If excess excavation is required to be filled it shall be filled by the contractor with concrete or masonry of the same type as used for foundation at his cost and risk.

6.0 DISPOSAL OF EXCAVATED MATERIALS

The excavated materials shall be dumped sufficiently away from the edges of excavation so as not to endanger stability of the slopes of excavation. The excavated stuff suitable for filling behind abutments, returns, approach roads or canal bank shall be conveyed and deposited, directed as per lead and lift specified in the item without any extra, payment on this account. If the contractor fails to do and the useful material is wasted by him, recovery shall be done at the rate applicable for collection of that type of materials.

7.0 SORTING OF EXCAVATED MATERIALS

The excavated materials shall be properly sorted out according to classification of materials useful for various works.

8.0 STACKING OF EXCAVATED MATERIALS

The useful materials not used directly in the work shall be conveyed and stacked in place approved by the Engineer - in - charge according to the nature of materials in separate and regular stock - piles measuring not more than 15 m x 15m x 1 m or in uniform slacks as directed the excavated materials not required for back filling or for other use will be stacked in spoil banks in regular shape with a suitable slope or spread in other use will be stacked in spoil banks in regular shape with a suitable slope or spread in other approved location or as directed by the Engineer with in the lead and lift specified in the items. All materials obtained from excavation will be the property of Government.

9.0 In reaches where vertical excavation is not possible the Executive Engineer may allow at his discretion excavation. In suitable slopes for the strata actually on counter. The extra excavation on this account shall be paid for within pay line slopes for different strata as under.

	(H:V)
Soil	1:1
Hard murrum	1:1
Soft Murrum	1:1
Soft rock	1/2:1

Hard rock 1/4:1

9.1 Generally for depth up to 1.5 vertical excavation shall be done.

10.0 SLIPS

Adequate steps shall be taken to prevent slips. However, if slip occur, the slopes should be flattened or supported or other measures as required shall be taken for stabilizing 3 slopes. The contractor shall clear the foundation trenches of slipped materials at his own cost contractor shall be held responsible and liable to pay all claims under worker's compensation act.

11.0 Preparation of foundation

The bottom of the foundation shall be dressed perfectly in level or benched as directed and all loose and soft materials shall be removed before laying of foundation concrete.

Before any concrete or masonry is laid the foundation shall well-watered and thoroughly rammed where the foundation is in strata other than rock, in case of rock, it shall be thoroughly cleared and wetted. Before laying the foundation concrete the contractor shall get the foundation approved from the Executive Engineer.

12.0 SILTING OF FOUNDATION PITS DUE TO FLOODS

if the foundation trenches get silted up due to intervening floods or other reasons, the contractor shall restore the foundations to the required dimension at his own cost.

13.0 DEWATERING AND DIVERSION

The rate includes dewatering and diverting surface and ground water. If any arrangement is necessary to carry out the work of dewatering. The contractor shall have to make the arrangement without any extra cost on Govt. However, this will not be applicable to structures for which items of" Extra for Dewatering: provided for separately.

14.0 MODE OF MEASUREMENT AND PAYMENTS

The measurement shall be based on the initial levels of the original ground and finally completed trench work within the limits of excavations as shown on the plans or as authorized by the engineer. The initial levels shall be taken at close interval of 30 meters or shorter interval depending upon the ground profile and as directed.

The quantity of the items shall be computed from the cross-sectional area with difference of the initial and final levels. The contractor shall be present at the time of taking level and shall sign the field book in the token of acceptance of the correctness

of the initial ground levels before the work is commenced and if final foundation levels as ensured at the end of work. When he remains absent at the time of taking level, the levels taken by the department shall be binding on him.

15.0 PREPARATION OF THE SUBGRADE FOR LINING

- 15.1 The subgrade shall be prepared by dressing watering and temping the canal bed and slopes true to level and according to the required cross-section of the canal to firm compacted before the lining. Profiles true of the cross section of the canal shall be made at suitable interval to insure correct formation of subgrade. To insure uniformity of side slopes a chord shall be under the slope to check the evenness of the surface. This process shall be repeated at short interval along the slope's tilt the surface wooden or steel template shall be used to set profiles. In straight reaches the profiles shall be at 3 to 4 m. interval this may be closer on curves. Dressing of bad shall be done carefully with the help of levels given at suitable interval along and cross the length of canal. The cost of dressing is inclusive in rate of items of concrete lining.
- 15.2 The excavated materials shall be first utilized in filling the secured side slopes or overcuts in any during up to the grade on underside of the lining or of filter bricking. Wei compaction by tamping as per relevant provision.
- 15.3 The materials remaining surplus thereafter, shall laid and as were directed by the slopes as far as scaffolding ladders etc. required for this purpose shall provide if the slopes are disturbed, they shall have to be redressed.
- 15.4 The excavation for the keys at the tops of lining shall be done with a stable slope and that same shall be back fill watered and compacted after the lining work has set.
- 15.5 The work of preparing subgrade as per para 1.2.1 to 1.6.8 of Section-II
- 15.6 Above is covered in the respective items of lining and on separate payment for this work shall be made.

Signature of Contractor

**Executive Engineer
Dharoi Canal Division No.3
Visnagar**

VIII. ITEM WISE DETAIL TECHNICAL SPECIFICATIONS

Item No. 1

Excavation in all sort of strata and formations incl. depositing the unuseful excavated stuff as and where directed incl. sorting and stacking useful materials in measurable conditions as directed up to 200mt lead and all lift etc. complete inc. dewatering.(A) In overburden incl. Hard Murrum.

1.1 Scope of work :-

The work to be done under these specifications shall consist of furnishing all tools plant and labour and materials required for carrying out excavation, conveyance and disposal of the excavated stuff, maintaining the excavation slopes and trenches preparing the foundation as shown on the drawing and dewatering the site (if any) by means of pumping etc. as directed by the Engineer and all operation covered within the intent and purpose of this item of work for dam in this vicinity, to afford safe blasting distance the works in this and other contract.

1.2 Classification

The work under excavation shall be divided into three items as under: Excavation in overburden including all soils, sand, gravel. Soft and hard murrum. This shall include all excavation done in strata include soft rock, disintegrated rock and hard rock. It covers excavation in and all kinds of soils such as brown soils reddish soils black soils, clay, sand, gravel, soft murrum or mixture of any of these soils, hard murrum shall include all kinds of soil with occasional and interspersed boulders not exceeding 0.028 m cube (one cft.) which do not need blasting and can be removed. In with pick and shovel.

1.3 Excavation in soft rock including disintegrated rock and weather rock.

This shall include excavation in all strata which are rock but do not need blasting and can be removed with pick bar and shovel but not without difficulty. This includes sand stone quartzite, hyalite and all types of disintegrated and weather granites etc. It shall also include excavation in boulders exceeding 0.028 m cube (one cft.) but less than 0.74 m cube (one cyd.) in size.

1.4 Excavation in Hard rock:-

This shall include all excavation in rock occurring in masses as well as in boulders exceeding 0.74 m cube (one cyd) in size which can best be removed by light blasting or chiseling by mechanical breaking. Preventive measures for any adjacent structure shall be taken by the contractor as directed by engineer in charge. Blasting which may cause the damages to any adjacent structure around check dam site is strictly prohibited. If any damage caused due to blasting procedure or wrong method by contractor the cost of repair or any claim shall be born by the contractor at his risk and cost. This shall also include rock required to be removed by chiseling where blasting is not permissible. This includes massive granites gneiss, quartzite rock net within the foundations.

1.5 Clearing site :-

Unless otherwise explicitly provided for the item of clearing site as below will be considered as include in the item of excavation and will not be paid for separately.

1.6 Removal of Rubbish :-

The area to be occupied by the dam and its apartment works etc. shall be cleared of all stumps, delayed timbers, bush, and rubbish and all other objectionable materials.

1.7 Disposal of waste materials from site clearance:-

Waste materials decided as such by the Engineer obtain from clearing operation shall be burn or removed otherwise as directed by the Engineer-in-charge to such areas on the downstream from where they would be washed away and would not obstruct the flow of the river.

1.8 Removal of loose rock:-

Before any work of excavation of foundation is taken up all loose rocks semi detached rocks, in or close to the area to be excavated, that is liable to fall or otherwise endanger the workmen of the works shall be stripped. The methods employed shall be such as will not shatter or render unstable and therefore unsafe any rock that was originally sound or safe. Any material not requiring removal as contemplated, herein but which may later become loosened or unstable shall be promptly and satisfactorily removed. The cost of such clearing also shall be deemed to have been included in the unit rates accepted under the different items under work of excavation

1.9 Undercuts and Over cuts :-

In the event of actual line of excavation being steeper than that specified under pay line above payment shall be made for the actual line of excavation only.

Over cuts beyond specified pay line of excavation carried out by the contractor for any purpose or reason unless at the specified direction of Engineer in charge shall be at the expense of the contractor. Refilling if required such unauthorized excavation with concrete masonry or other suitable materials as may be directed by the Engineer shall also be done by the contractor at his own expense.

1.10 Shoring and Strutting :-

Maintenance of Excavation slopes :-

Any Shoring and strutting that may be required during excavation and progress of work shall be deemed to be covered by the rates quoted for the respective items of excavation.

1.11 Slips-Government not responsible:-

Slips shall be avoided but if any slip occurs on account of any reason the excavation shall be promptly restored to stability. No claims shall be entertained for such slips and their consequences. The excavated trenches, filled due to monsoon or any other reason shall be cleared as directed by the Engineer in charge by the contractor without any extra cost

1.12 De silting & dewatering of foundation Pits due to rain water :-

If the Foundation trenches silted or filled up due to intervening rains or other reasons the contractor shall restore the foundations to the required dimensions at his own cost.

1.13 Disposal of excavated Material :-

1.13.1 The contractor shall not sell or otherwise dispose off or remove, except for the purpose of this contract, the sand, clay, ballast, earth, rock or other substances or materials which may be obtained from any excavation made for the purpose of this contract or produce upon the site at the time of delivery of the possession of the land, but all such substances, materials and produce shall be disposed of in the manner and place shown in the drawings or as and where the Engineer may direct.

1.13.2 The material obtained from the excavation of foundation of Protection Wall shall be disposed of in area downstream or as directed.

1.13.3 No material shall be disposed where it will detract from the appearance interfere with the accessibility of the complete structure. Excavated materials shall not be carelessly thrown over the entire premises of work, but shall be deposited directly in permanent position, consistent with proper execution of work. The directives of Executive Engineer shall be binding in respect of location of disposing the waste material.

1.14 Mode of measurement & payment:

The measurement shall be of length, width and depth by tape measurement and quantity shall be calculated and payment shall be made on Cu.M. basis of excavated foundation.

Item No. 2

Providing and laying Non-Woven Geo Fabric Filter (weight more than 235 gm/Sq.mt.) over the excavated surface as per specification including stitching with overlap to design profile as directed in tidal range etc. complete.

- [1] Term consists of supplying non woven geo fabric filter and spreading it over the dressed excavated surface as by directed by Engineer-in-charge-in-charge.
- [2] The Geo fabric filter shall be of good quality and shall confirm the following specification. Material test certificate of materials supplied by the manufacturer shall be produced by the contractor. The certificate shall mention that the material meets the contract specification.

Geo fabric filter shall be polypropylene multifilament non woven fabric. The individual multifilament shall be staple together in such a manner so as to provide dimensional stability relative to each other. It shall be ideal for reinforcement, drainage and filtration function.

Geo textile shall be resistant to ultraviolet degradation and to biological and chemical environments normally found in soils. Geo fabric shall confirm to physical tests prescribed by bureau of Indian standard (IS-1969). The geofabric material shall confirm Table

**TABLE SHOWING THE PHYSICAL PROPERTIES OF NON WOVEN
GEO FABRIC FILTER**

Sr.No	Physical properties	Test Method	Value
	Polymer	100% polypropelene,UV stabilized	
	Structure	Staple fibre needle-punched nonwoven geotextile	
1	Mass per unit area	ASTM D 5261	$\geq 235\text{g/m}^2$
	Mechanical		
1	Tensile elongation	ASTM D 4595	55(md)/55(md)
2	puncture strength	ASTM D 4833	$\geq 550\text{N}$
	Hydraulic		
1	Apparent opening size (O95)	ASTM D 4751	$\leq 180\mu\text{m}$
2	Water flow rate	ASTM D 4491	$\geq 65\text{ l/sqm/sec}$
3	Tensile Strength	ASTM D 4595	13.5(md)/15.5(md)
4	Trapezoid tearing strength	ASTM D 4533	350(md)/775(cd)

- [3] The manufacturer of geo fabric filter shall preferably be ISO-9001-2000 certified. The manufacturer must have in house laboratory facility for carrying out all tests specified.
- [4] The Contractor shall arrange to test specimen of non woven Geo fabric filter to confirm all the requirements laid for Geo fabric filter at BTRA- Mumbai/ Equivalent laboratory of manufacturer approved by Engineer-in-charge.
- [5] After the specimen of non woven Geo fabric filter sent by the contractor are found satisfactory and the manufacturer is found to be suiting requirements laid. The Engineer-in-charge shall allow the contractor to place order for manufacturing of Geo fabric filter with approved manufacturer.
- [6] The non woven Geo fabric filters cloth in lot 2000 sq.mt. shall be tested in the presence of the Engineer-in-charge or his representative and/or third party and then dispatched to the site of work. The manufacturer shall furnish his own certificate for Geo fabric filter supplied.
- [7] The above non woven Geo fabric filter shall be securely fastened with the bamboo grid on the Lee side of the creek by means of 3mm dia. HDPE braided double twine string.
- [8] The type, quality and specifications for the geo fabric filter have been decided on the basis of type of beach materials existing while preparing the estimates. The type quality and specifications at the time of execution, contractor shall have to provide the Geo fabric filter as per the type, quality and specification mentioned by the Engineer-in-charge at the time of execution without any extra cost. The Contractor shall have no claim to any payment or compensation what so ever on account of change in type, quality and specifications of geo

fabric filter.

- [9] Non woven Geo fabric filter shall be tested before shipment to confirm the requirement laid and sampling, transportation etc. of such testing at the Government laboratory or at the laboratory approved by Engineer-in-charge shall be arranged by the contractor at his cost.
- [10] Before laying non woven geo fabric filter it shall be got approved from the Engineer-in-charge.
- [11] Surface shall be first dressed and prepared. The non woven geo fabric filter shall be laid as shown on drawing or as directed by Engineer-in-charge after trimming, ramming and dressing the ground or bed directed by Engineer-in-charge. The geo fabric filter with min. width 5.00 M. and above shall be used in order to minimize the joints.
- [12] At Longitudinal and transverse joints, non woven geo fabric filter shall be laid with overlap of 50 cm. and joints shall be double chain stitched on all sides by manually using appropriate pp yarn string as directed by Engineer-in-charge.
- [13] The non woven geo fabric filter shall be spread in position without any wrinkles and care shall be taken so as to avoid any damage to it, after spreading. To keep the nonwoven geo fabric filter in desired position duly stretched until the same is covered by gabions.
- [14] Any loss or damage to non woven geo fabric filter due to any natural causes shall be made good and remedied by the contractor at his risk and cost to the satisfaction of Engineer-in-charge.

Mode of measurement and payment:

- [15] Item shall be measured in square meters of the net surface covered, which shall not cover the overlap area.
- [16] The rate shall be for unit of one sq.mt. of surface area covered and inclusive of cost of materials as well as cost of carrying out all operations to complete the item.

Item No. 3

Quarrying, transporting and laying inclined or horizontal sand filter of required gradation in earth dam in layers of specified thickness incl. required watering light rolling for all lead and lift etc. complete

3.1 GENERAL

The work shall consist of quarrying/procuring, transporting, sorting, providing and laying horizontal or inclined sand filter zones within the earth dam structure. The sand filter shall be constructed to the lines, grades, cross-sections, and dimensions shown on the approved tender drawings or as directed by the Engineer-in-Charge. The filter layer is designed to allow free drainage of seepage water while preventing the migration of fine soil particles from the core/casing zones.

3.2 MATERIALS

3.2.1 Quality and Origin: The sand for the filter layer shall be obtained from approved riverbeds, quarries, or sources specified by the department. It shall consist of clean, sound, hard, durable, and un-weathered particles of natural sand or crushed stone.

3.2.2 Deleterious Substances: The sand shall be completely free from harmful amounts of clay, silt, loam, mica, organic matter, shells, alkali, or other deleterious materials. The total percentage of all deleterious substances shall not exceed 3% by weight.

3.2.3 Gradation / Particle Size Distribution: The sand filter material shall be well-graded within specified limits to fulfill the filter criteria design. Unless otherwise specified in the special conditions or design sheets, the gradation shall strictly conform to IS: 4968 and IS: 9429 guidelines. The criteria relative to the base material shall satisfy:

$$(D_{15} \text{ of Filter} / D_{85} \text{ of Base}) < 4 \text{ to } 5$$

$$(D_{15} \text{ of Filter} / D_{15} \text{ of Base}) > 4 \text{ to } 5$$

$$(D_{50} \text{ of Filter} / D_{50} \text{ of Base}) < 25$$

Routine sieve analyses shall be conducted at regular intervals at the site laboratory to ensure consistency in gradation. Any material not matching the design envelope shall be rejected immediately.

3.3 WORKMANSHIP / CONSTRUCTION METHODOLOGY

3.3.1 Preparation of Foundation / Base: Before laying the sand filter layer, the surface of the underlying layer (whether foundation rock, core soil, or casing) shall be cleared of all loose materials, debris, mud, and pools of water. The surface shall be properly graded, dressed, and compacted to the required profile as per design lines.

3.3.2 Laying and Spreading:

1. The sand filter material shall be transported from the source to the site of deposition using suitable vehicles (tippers/trucks) without causing segregation of particle sizes.
2. The sand shall be laid in uniform horizontal or inclined layers as specified in the drawings. The uncompacted thickness of each layer shall not exceed 150 mm to 200 mm, or as designated by the design specifications.
3. Spreading shall be performed manually or with appropriate mechanical spreaders to ensure a uniform thickness throughout the reach. Special care must be taken at the interfaces with the core or casing zones to prevent any intermixing or contamination of sand with cohesive soils.

3.3.3 Watering and Moistening: Controlled watering shall be carried out uniformly over the spread layer. The moisture content shall be maintained around the optimum limit required to achieve the desired relative density or compaction without causing liquefaction, piping, or washing away of fines.

3.3.4 Rolling and Compaction:

1. Compaction shall be carried out using light rollers, plate vibrators, or power rammers as directed by the Engineer-in-Charge, ensuring that no crushing of individual sand grains takes place.
2. Heavy rolling equipment shall be prohibited over the sand filter zones to prevent damage to the design geometry or structural damage to the interface zones.
3. The layer shall be compacted to achieve a minimum relative density of 70% or as specified in the design criteria.

3.4 LEADS AND LIFTS

The rate quoted by the contractor shall be comprehensive and fully inclusive of all leads (horizontal transport distances) and lifts (vertical transport heights) required from the source/quarry to the final point of placement in the

earth dam. No extra payment or claims will be entertained on account of variations in lead distances or vertical heights.

3.5 TESTING AND QUALITY CONTROL

The contractor shall establish a regular testing regimen under the supervision of departmental engineers. The following tests shall be performed:

- * Sieve Analysis (Gradation Test): Minimum 1 test per 100 cubic meters of sand supplied/laid.
- * Field Density / Relative Density Test: Minimum 1 test for every 50 meters length of the layer or as decided by the Engineer-in-Charge.
- * Deleterious Content Determination: Daily or whenever the source characteristics change.

3.6 MODE OF MEASUREMENT AND PAYMENT

3.6.1 Mode of Measurement: The measurement for the sand filter work shall be done on a volumetric basis. The volume shall be calculated in Cubic Meters (cum), computed by taking the product of the actual length, width, and compacted thickness of the filter zone specified in the drawings, or by the method of cross-sectional areas based on pre-work and post-work levels taken jointly by the departmental staff and the contractor. No allowance will be made for shrinkage, voids, or over-cutting.

3.6.2 Rate Includes: The unit contract rate shall include the full cost of:

- * Quarrying, extracting, or procuring sand from approved sources, including all royalty charges, seigniorage fees, taxes, and duties.
- * Clearing, screening, washing (if required), and grading the material to conform to strict specifications.
- * Loading, transporting, unloading, and stacking/spreading at the site of work.
- * All leads and lifts involved in the execution of the item.
- * Forming horizontal or inclined layers, leveling, dressing to correct lines and slopes.
- * Providing water, spraying, and compacting with light rolling equipment or vibrators.
- * All labor, materials, tools, equipment, testing, and incidentals necessary to complete the work in accordance with these specifications.

3.6.3 Payment Basis: Payment will be made at the tendered unit contract rate per Cubic Meter (cum) upon satisfactory completion of the work and approval of quality control test results by the Engineer-in-Charge

Item No. 4

Providing and supplying mechanically double twisted highly galvanized with (PVC) polychloride coating gabions made of mesh size 10 x 12mm woven wire as per ASTMA-975-97 size of gabion 1 m x 1 m x 1 m including providing and laying stones in the gabions and arranging them in a required manner in the section of break water or such other structure including quarrying, blasting, loading at quarry site, transporting at worksite and arrange in the gabions in workman like manner with required layer thickness and arranging this gabions in required layers with the crane of required capacity (If required, as per drawing or as directed) with all material, labour, tools etc. complete.

- A) Zn +PVC Coated Mechanically woven, double twisted, hexagonal shaped steel wire mesh cage of variable sizes, uniformly partitioned by provided Diaphragms at every 1m interval along the length, interconnected

with other similar units, and filled with stones of appropriate sizes and shapes at the site of form flexible, precast monolithic structures such as retaining walls, slope protection structures, erosion and scour protection measures, various types of Hydraulic Structures for river and channel protection like weirs, check dams, groyne, channel lining etc.

- B) Double twisted wire mesh, n-a non-raveling mesh manufactured by twisted continuous pairs of wire through three one-half turns (commonly called double twisted) to form hexagonal shaped mesh opening which are then interconnected to adjacent wires to form hexagonal meshes.
- C) Selvedge wire, n - a terminal wire used to edge the wire mesh perpendicular to the double twist by mechanically wrapping the mesh wires around it atleast 2.5 times.
- D) Edge wire, n- a terminal wire of the same diameter as the selvedge wire used to edge the wire mesh parallel to the double twist by continuously it mechanically in to the wire mesh.
- E) Lacing wire, n -galvanised wire with used to assemble and interconnect empty units, to close and secure stone filled units and for internal bracings.
- F) Stiffener, n - a length of galvanized wire used for support of facing by connecting the front panel to the back panel of a gabion and having the same diameter as the lacing wire.
- 2) Material and Manufacture :
 - a) The wire used in the manufacture of mechanically woven, double twisted, hexagonal shaped mesh for use in gabions shall conform to the specifications shown in (4.5 and Table-4).
 - b). Gabions shall be manufactured with all components mechanically connected at the production facility with the exception of the mattress lid which is produced separately from the base and the end panels shall be connected to the base net by wire loops or wire tags. The manufacturing facility should be capable of mechanically performing Salvaging function i.e. wrapping of mesh wire at least 2 and half times the terminal wire. All gabions shall be supplied in the collapsed form, either folded and bundled or rolled for shipping.

SPECIFICATIONS OF PVC COATED G.I. WIRE GABIONS

Table 1 – Mesh Characteristics

Mesh type	10 X 12						Specifications	
Mesh Opening D’ mm	100						EN 10223	
Mesh Tolerance	+16% to – 4%						EN 10223	
Unit Dimensions	L X W X H							
Tolerances	L & W +/-5% H<=0.3 +/- 5%						ASTMA 975	
Characteristics	Zn	Zn	Zn	Zn+PVC				
Mesh wire dia MM	2.7	3.0	2.7	1.0	EN10223			
Tolerance(+/-)mm	0.08	0.08	0.08	0.08	BS1052			
Zn Coating Min gsm)	230	240	230	230	ASTM A 641			
Selvedge wire Dia mm	3.4	3.9	3.4	3.4	EN10223			
Tolerance (+/-)mm	0.10	0.10	0.10	0.10	BS1052			
Zn Coating Min gsm)	260	270	260	260	ASTM ^641			
Lacing wire dia mm	2.2	202/2.4	2.2	2.2	ASTM A975			
Tolerance(+/-)mm	0.06	0.06	0.06	0.06	BS 1052			
Zn Coating Min gsm)	220	220/230	220	220	ASTM A 641			
PVC Thickness								
Nominal mm	NA	NA	0.50	NA	0.50	NA	0.50	ASTM A975
Minimum mm	NA	NA	0.38	NA	0.38	NA	0.38	ASTM A975

Material Used to manufacture above Mesh. All tests below are carried out prior to manufacture of Mesh.

Galvanized wire			PVC Coating		
Test	Value	Specification	Test	Value	Specification
Tensile Strength	350 to 500 N/mm ²	EN 10223	Hardness	Between 50-60 Shore 'D'	ASTM D2240
Elongation	10%	EN 10223	Colour	Grey RAL 7037	ASTM D1482
Adhesion of Zn.	No Flakes	EN 10244	Tensile Strength	20.6 Mpa min	ASTM D 412
			Specific Gravity	1.3 to 1.35	ASTM D 792
			Abrasion Resist	<12% Wt. Loss	ASTM D 1242
			Salt Spray Test	No effect	Astm B 117
			Exposure to UV	No effect	Astm A 975

- 3) Mechanical Properties.
- a. Tensile Strength – The tensile strength of wire used for mechanically woven, double-twisted hexagonal shaped mesh, lacing wire, and stiffener, when tested shall be in accordance with the requirements of specification EN 10223 – 3:1997 – (350 – 500 N/mm²) at minimum elongation of 10%.
- b. Tensile Strength of Mesh Panel – The minimum tensile strength of the Mesh panel must be 32 kN/m in the parallel to twist direction.

Table 2 – Minimum Mesh Strength

Mesh Type	10 X 12	
Characteristics	Zn	Zn
Mesh wire dia MM	2.7	3.0
Parallel to twist mm	32.0	40.0
Perpendicular to twist kN/m	15.40	20.50

- 4) Physical Properties.
- 4.1. Zink Coating – The coating weights shall conform to the requirements of specification ASTM A 641. Class 3, for zinc coating.
- 4.2. PVC for Coating – The initial properties of PVC coating material shall have a demonstrated ability to conform to the following requirements,
- 4.2.1 Specific Gravity - In the range from 1.30 to 1.35 when tested in accordance with Test Method 792
- 4.2.2 Colour – Grey RAL 7037 when tested in accordance with D 1482
- 4.2.3 Tensile Strength – Not less than 20.6 Mpa when tested in accordance with Test Method D 412.
- 4.2.4 Modules of Elasticity – Not less than 18.6 Mpa when tested in accordance with Test Method D 412.
- 4.2.5 Hardness – Shore “D” between 50 and 60 when tested in accordance with Test Method D 2240.
- 4.2.6 Brittleness Temperature – Not higher than - 90C or lower temperature when specified by the purchaser, when tested in accordance with Test Method D 746
- 4.2.7 Resistance to Abrasion – the percentage of the weight loss shall be less than 12% when tested in accordance Test Method D 1242.
- 4.2.8 Salt spray Exposure and Ultraviolet Light exposure.
- 4.2.8.1 The PVC shall show no effect after 3000 h of salt spray exposure in accordance with Test Method B 117.
- 4.2.8.2 The PVC shall show no effect of exposure to ultraviolet light with test exposure of 3000 h. using apparatus type E and 630 C, when tested in accordance with practice D 1499 and G 23.
- 4.2.8.3 Evaluation of coating after Salt Spray and Ultraviolet Exposure Test – After the salt spray test and exposure to ultraviolet light as specified in 8.2.7.1 and 8.2.7.2, the coating shall not show cracks nor noticeable change of colour, or blisters or splits. In addition, the specific gravity, tensile strength, hardness and resistance to abrasion shall not change more than 6%, 25% ,10% , respectively from their initial values. The mesh wire shall show no rusty spots on any part of the surface excluding the cut ends.
- 4.2.9 The PVC coating shall not show cracks or breaks after the wires are twisted in the fabrication of the mesh.

5) Specifications :

The Specifications and standards followed are as per Table-3

TABLE-3

Mesh, Wire and PVC coating Characteristics

Mesh Type	10 x 12	Specifications
Mesh Opening ‘D’ mm	100	EN 10223
Mesh Tolerance	+16%-4%	EN 10223
Unit Dimensions	L x W x H	
Tolerances in sizes of units	L & W +/-5% :H<0.3m +/-10% :H>0.3m +/-5%	ASTM A975
Characteristics	Only Zn+PVC Coated	
Mesh wire Dia mm	2.7/3.7(I.D/O.D)	En 10223
Tolerance (+/-)mm	0.08	RS 1052
Zn Coating Min (Gsm)	240	ASTM A641
Selvedge/Edge Wire Dia mm	3.4/4.4(I.D/O.D)	EN 10223
Tolerance (+/-)mm	0.10	Bs 1052
Zn coating Min (Gsm)	260	ASTM A641

Lacing Wire Dia mm	2.2/3.2/(I.D./O.D)	
Tolerance (+/-)mm	0.06	BS 1052
Zn Coating Min (gsm)	220	ASTM A641
PVC Coating		
Thickness Nominal (mm)	0.50	ASTM A975
Thickness Minimum (mm)	0.38	ASTM A975
Hardness	Between 50-60 Shore D	ASTM D 2240
Colour	Grey RAL 7037	ASTM D 1482
Tensile Strength	Min. 20.6 MPa	ASTM D 412
Specific Gravity	1.3 to 1.35	ASTM D 792

5.1 Dimensions and Tolerances.

5.1.1. The diameter of galvanized steel wire shall conform to the values plus or minus the tolerances shown in Table-1.

5.1.2. The minimum and nominal thickness of PVC coating uniformly applied in a quality workman like manner shall be as shown in Table-1.

5.1.3. Gabions shall be manufactured with a 10 x 12 mesh type having a nominal mesh opening of 100mm or 80mm respectively. Dimensions are measured at right to the centeraxis of the opening and parallel to the twist along the same axis.

5.1.4. Rivet mattresses shall be manufactured with a 6 x 8 mesh type having a nominal mesh opening of 60mm. Dimensions are measured at right angles to the center axis of the opening and parallel to the twist along to the same axis.

5.1.5. Rock fall netting shall be manufactured with a 10 X 12, mesh type. The minimum and nominal thickness of PVC coating uniformly applied in a quality Work man like manner shall be as shown in Table-1.

5.1.6. The width and length of the gabions and rivet mattresses as manufactured shall not differ more than +/- 5% from the ordered size prior to filling. (Typical gabion and rivet mattresses size are shown; in Table-3 and 4 respectively.

5.1.7. The height of the gabions and rivet mattresses as manufactured shall not differ more than +/- 10% if the height is less than or equal to 0.3 m and shall not differ more than +/- 5% of if the height is more than 0.3 m from the ordered size prior to filling.

8. The tolerance on the roll length of rock fall netting shall be + 1 m to 0 m. The tolerance on the width shall be +/- D (mesh size).

5.1.9. Mesh opening Tolerances – Tolerances on the hexagonal, double dtwisted wire mesh opening shall not exceed + 16% to – 4% on the nominal dimension D values mentioned in Table-1.

6.0 Workmanship and Designs :

6.1 Wire of proper grade and quality, when fabricated in the manner herein required, shall result in a strong serviceable mesh-type product having substantially uniform openings. It shall be fabricated and finished in a workman like manner, as determined by visual inspection and shall conform to this specification.

6.1.2 Whenever required, the purchaser may approach the purchaser may approach the manufacturer to provide a technically sound design for the proposed gabion structure.

Table-4 Typical Gabion sizes (10 x 12 mesh type)

Length . m	Width.m	Height.m	Number of Diaphragms
4.0	1.0	1.0	3
3.0	1.0	1.0	2
2.0	1.0	1.0	1
1.5	1.0	1.0	0
4.0	1.0	0.5	3
3.0	1.0	0.5	2
2.0	1.0	0.5	1

7.0 Sampling &Testing :

- a. The manufacture of Gabions , must have in house computerized testing laboratories to perform all the tests specified for the products in the documents and should offer cost free tests on the samples.
- b. Sample of wire (used before manufacturing) shall be taken from lot of materials supplied at least once and needs to be tested at the in house laboratory for following properties.
 - i. Tensile strength of Mesh wire
 - ii. Zinc coating and Adhesion of Zinc Coating of Mesh wire

- c. Similarly, samples of mesh panels (preferable the diaphragm panels) must be taken from the lot of materials at least once and needs to be tested for the tensile strength of the mesh panel as stipulated in 4.2 at the in house laboratory.
- d. Sampling and testing as per IS 16014 :2012

8.0 Number of Tests

8.1 A minimum of three tests each for conformance to strength of galvanized steel wire mesh parallel to twist and perpendicular to twist shall be performed. A retest for conformance with the aforementioned strength tests shall be required when changes of the physical characteristics of the mesh products occur. For galvanized steel wire with PVC coating, follow the same requirements as for the galvanized steel wire mesh. The results of all three tests must meet the requirements of Table-2. In addition to this the tests required to confirm the quality as per tender specification shall be carried out at certified/available institution/agency as & when suggested by the Engineer-In-charge.

8.1.2 The tensile strength, galvanizing weight, and PVC coating thickness of the coated steel wire used in the fabrication of mesh, lacing wire and stiffeners must be certified by the steel wire producers for conformance to the requirements of section 6 and 7 and Table 1 for each lot shipment to the gabion manufacturer's facility.

9.0 Test Methods :

9.1 Mechanical property Tests :

9.1.1 Tensile strength Test – The wire mesh specimens shall be representative of proper field construction as to materials, mesh geometry and workmanship, and shall be as large as practical to minimize the effect of variations. The tests shall to run with the load applied parallel to the axis of the twist and repeated on a separate test specimen with the load applied perpendicular to the axis of the twist.

9.1.1.1 The apparatus shall grip the wire in such a manner as to allow the wire failures to occur at least one mesh pattern away from the gripping points. If a failure occurs in a wire leading directly to a gripping point that specimen shall be rejected, and not included among the tests reported.

9.1.1.2 Insert the wire in to the machine grips and the axially free sliding adjustable spreader system attachment points such that the gripped

Wires will be maintained in the mesh geometry characteristic of field use and attached in such a manner as to climate failure at the grips. The grips may be left loose until the preload is applied to allow the wires to seat. The load is then applied at a uniform rate not to exceed 50 nor 3% of the mesh ultimate strength per second. The load shall be initially be taken to a preload of 20% of the specified minimum strength and the machine head travel stopped. The mesh gauge dimensions shall be recorded at this time and taken as the initial dimensions of the specimen where such dimensions are required. Loading shall then continue uniformly in increments of 10% of the specified minimum strength until first fracture or unwrapping of an individual wire in the system occurs. The machine head travel at each load increment or sequential incident of wire failure may be stopped for recording pertinent information such as load, fracture type, resulting mesh geometry and elongation, and resulting reduction in wire gage. The distortion of the mesh or changes in gauge length shall be measured to an accuracy consistent with reporting the percent elongation to the nearest 0.5%. The results of the tests should be in accordance with Table-2.

9.2 Metallic Coating Weight perform coating weight tests as prescribed in ASTM A 641.

9.3 PVC coating Thickness

9.3.1 The thickness of the PVC coating shall be determined on a randomly chosen Individual Piece of wire removed from the mesh.

9.3.2 Measure with a micrometer the diameter of the galvanized steel wire with PVC coating from the wire and measure the reduced diameter with a micrometer. The thickness of the coating is the difference between the diameter of the galvanized steel wire divided by two. This value should be in accordance with Table-1. When removing the PVC coating by stripping, take care not to remove any of the metallic surface.

10.0 Inspection :

10.1 Unless otherwise specified in the contract or purchase order, the producer is responsible for the performance of all inspection and test requirements of this specification. The producer shall use his own or any other suitable facilities for the performance of the inspection and test requirement, at his option, unless disapproved by the purchaser at the time the order is placed. The purchaser at their own expense shall have the right to perform any of the inspections and tests set forth in this specification when such tests are deemed necessary to ensure that the material conforms to the prescribed requirements.

11.0 Certification :

To ensure a good quality material, following documents/certificates needs to be provided to the Engineer-in-charge for approval of the product and the supplier. A producer's certification that the material meets the contract specifications shall also be furnished to the purchaser viz.

- a. Capability to produce 10 x 12 mesh type of width up to min. (In perpendicular to twist direction)
- b. Having in House facility for extrusion of PVC coating over the G.I. wire for Gabions.
- c. Facility to perform the function of Mechanical Sledging i.e. wrapping of the mesh wire round the selvedge wire at least 2 and half times.
- d. The supplier should have in house facilities for computerized testing of Gabion Viz. tensile strength of wire and mesh panel.

12.0 Installation :

The purchaser must obtain proper installation manual from the supplier and carry out the installation as per the instructions provided.

A Assembly:

Gabions are supplied folded flat and acked in bundles. Ledger units may be supplied in rolls. The units are assembled individually by erecting the slides, ends and diaphragms ensuring that all panels are in correct position, and the tops of all sides are satisfactorily aligned. The four corners shall be connected first, followed by the internal diaphragms to the outside walls. All connections should use lacing wire. The procedure for using lacing wire consists of cutting a sufficient length of wire and first looping and/or twisting the lacing wire to the wire mesh. Proceeds to lace with alternating double and single loops through every mesh opening approximately every 150 mm. pulling each loop tight and finally securing the end of lacing wire to the wire mesh by looping and/or twisting.

B. Installation :

After initial assembly, the gabions are carried out their final position and are securely joined together along the vertical and top edges of their contact surface using the same connecting procedure(s) described in Section 10 a. Whenever a structure requires more than one layer, the upper empty baskets shall also be connected to the top of the lower layer along the front and back edges of the contact surface using the same connecting procedure(s) described in section 12.a.

C. Filling :

Gabbions shall be filled with stone of 10 kg to 50 kg. weight. The rock for gabions shall be hard, nearly cubical in shape durable and of such quality that they shall not disintegrate on exposure to water or weathering during the life of the structure. During the filling operation good hand packing and stone placement is required to minimize voids. The exposed faces of vertical structure may be carefully hand placed to give a neat, flat and compact appearance. Care shall be taken when placing fill material to assure that the sheathing on the PVC coated baskets will not be damaged. The cells shall be filled in stages so that local deformation may be avoided.

That is, at no time shall any be cell be filled to a depth exceeding (0.30 m) higher than the adjoining cell. It is also recommended to slightly over fill the baskets to allow for settlement of the rock. Behind gabion walls, compact the back fill material simultaneously to the same level as the filled gabions.

2.0 specification for the stone shall be same as mentioned in the specification for item no. 4 and 5 (four and five) including all test except size and wight.

3.0 Rubble stone of 10 to 50kg

D. Internal connecting wires:

Internal connecting wire should be used when a structure requires layer of gabions to be stacked on top of each other. Internal connecting wire shall connect the exposed face of a cell to the opposite side of the cell. An exposed face is any side of gabion cell that will be exposed or unsupported after the structure is completed. Lacing wire or prefabricated internal connecting wire may be used.

• 0.75 m. High Gabions

0.75 mt high gabion shall be filled in three layers, 0.25 mt. at a time. Connecting wire shall be installed after the placement of each layer, that is at 0.25 mt. high and 0.5 mt. high.

E Lid Closing ; Once the gabion baskets are completely full, the lids will be pulled tight until the lid meets the perimeter edges of the basket. The lid must then be tightly laced and/or fastened along all edges, end and tops of diaphragms in the same manner as described in 12a.

13.0 Mode of Measurement & Payment.

Item shall be measured in number basis of the gabions laid.

The rates for payment shall be for unit of numbers of gabions used for construction of armour including cost of materials as well as cost of carrying out all operations to complete the item.

Mode of Measurement & Payment.

Item shall be measured in number basis of the gabions laid.

The rates for payment shall be for unit of numbers of gabions used for construction of amount including cost of materials as well as cost of carrying out all operations to complete the item.

Item No.5

Earthwork Backfilling with selected earth brought from outside borrow area or from excavated useful material incl, watering, ramming, compaction with pneumatic tamping with lead up to 1 km and all lift etc. complete

5.1 MATERIALS:

Selected earth obtained from outside the borrow area/pits or useful excavated materials shall be used for the execution of the item.

5.2 SCOPE OF WORK:

The scope of this item of work includes loading and transporting the suitable excavated materials with all lead all lift and laying, spreading in specified layer with necessary dressing, finishing, watering and compaction etc. complete.

5.3 WORKMANSHIP:

The item includes excavation from borrow area or pits & conveying the same to the site of work, stacking and spreading in uniform layers of thickness (loose) not exceeding 25 cm or as directed & shall be well compacted. Consolidation near the structure shall have to be done by suitable pneumatic tampers/hammers, or plate vibrators, or light rollers etc as directed by engineer in charge with watering. Back filling shall be done simultaneously with raising of the structure. The scope of work includes excavation, carting, loading/unloading, stacking, spreading the material with rolling and watering with all machineries and labours required with all lead and all lift. Work shall be done with all care so that there shall not be any damage to the structure. Finished earth fill shall be of required density.

5.4 MODE OF MEASUREMENT AND PAYMENT:

Payment shall be made on a cubic meter (Cum.) basis for the quantity of work completed.

Item No.6

Care and Diversion of river crick incl. required dewatering during construction of earth dam, COT, and allied works as prescribed and directed etc. complete

6.1 GENERAL:

The work in general shall be carried out in workmen like manner as well as the correct section batter and gradient as per drawing and to the entire satisfaction of the Engineer-in-charge or his authorized representative. The site shall be cleared off all rubbish materials and heaps etc. and shall be handed over in neat and good condition after completion of work. The work shall be carried out as per the specification written specially for the items of work and in case if dispute in the specifications the work shall be carried out as per specification given in P.W.D. Hand Book VOL.1 and 2 and or as per relevant latest I.S.I, standard. The contractor or his authorized agent shall sign the working cross section as well as field books etc. in token of acceptance prior to starting the work. No dispute in regard of acceptance of levels shall be entertained at later stages. During the course of execution of work the contractor shall have to remove the silting or accumulation of such materials that might have accumulated due to any reason. No extra payment shall be made to the contractor on this account.

6.2 CARE AND DIVERSION OF RIVER INCLUDING DEWATERING GENERAL:

6.2.1 The area under all permanent work and the adjoining areas, if necessary, shall be Maintained freefrom water.

6.2.2 The contractor shall design, construct and maintain necessary diversion channel and other

temporary diversions and protective works and make provisions for diversion of the river flows and furnish, maintain and operate all necessary pumping and draining plants, for dewatering the various part of the works, i.e. check dam etc. and maintaining the foundations, sump drainage and grouting system and other parts of the work as free from water as required for approved construction operations.

- 6.2.3** The area shall also be maintained free of water after any part of the work is completed for inspection safety and installation by Government or any other reasons determined as necessary by the Engineer-in-charge. The contractor shall pump all water from the site of the check dam and appurtenant works and shall keep the foundations free of water while excavation, grouting and concreting on placing masonry or as otherwise required for completing the work and shall be entitled to no claims or damages on account of or by reasons of any amount of water leaking through under on around the diversion channel and other diversion and allied work etc. During the monsoon season, the work in the river portion shall be closed and the floods will be passed over to the partly constructed masonry dam only and under no circumstances such flow will not flank the other part of the work. The gorge portion is to be sealed by the earthen dam and the decision regarding sealing of gorge portion shall be made as per the phases of the work in consultation with Engineer-in-charge. The contractor should plan the work accordingly in consultation with the department.
- 6.2.4** The care and diversion work shall have to be reckoned and provided for any eventualities like unseasonal floods etc.
- 6.2.5** Preliminary thought has been given to the diversion works and it is visualized that diversion channel together with an upstream and downstream supporting wall may be required to divert the post monsoon flow. The diversion is likely to be required for a period of one years of depending upon the progress of work achieved. The above scheme is purely for general guidance only and any inference and conclusion reached thereby the tendered are at his risk and responsibility.
- 6.2.6** The contractor will be free to suggest alternative arrangement which is considered suitable and safe and not likely to obstruct or delay the progress which may be approved at the description of the Engineer-in-charge. The contractor shall not be entitled to any extra claim on this account.
- 6.2.7** The contractor shall fully satisfy himself about the quantum of flow to be tackled and about the adequacy, efficiency, and safety of the care and diversion arrangement to be adopted by him.
- 6.2.8** The Engineer shall however have the right to direct to enlarge or strength en the arrangements if he so consider in the interest of work. All such additions, modification etc. directed by the Engineer shall be promptly executed by the contractor and the same shall be deemed to be the part of the care and diversion arrangement and included in the agreed lump sum amount accepted for the item.
- 6.2.9** In case of the diversion arrangements getting washed out of largely damaged in pre-monsoon or post monsoon shown, the same shall be immediately repaired and redone by the contractor to its original same condition at his own cost. Necessary pumping of water, removal of site etc. shall also be executed promptly so as to cause the least delay in the progress of work. No claim shall be entertained on this account.
- 6.2.10** The contractor shall construct the diversion arrangements in such a way that no damage would be caused to the permanent or temporary structure or other running works by dept or other agency. If such damages are caused due to the flood water either during the monsoon or in the post monsoon period the same shall be made good at the contractor's cost.
- 6.2.11** Irrespective of whether contractor intends to follow the diversion arrangements proposed by the Department on his own alternative arrangement, he will submit within one months or notice to

proceed with the work, his plan for diversion and care of the river with detailed drawing of his diversion channel for approval of the Engineer and once they are approved, he shall follow the same. In case of the need however, he shall be free to submit a revised plan of diversion and obtain fresh approval of the Engineer there to. The data to be submitted by the tenderer shall include layout and dimensions of diversion channel, location of pumps and their capacity methods of dewatering etc.

- 6.2.12** Approval of the plans for the diversion works by the Engineer will not relieve the contractor from the responsibility for the adequacy thereof and pumping plant or from furnishing all equipment, layout material necessary for dewatering the foundation and keep the work area free of water for all items necessary within the scope of this contract.
- 6.2.13** The contractor shall construct and maintain the diversion channel, furnish install and operate all necessary pumping and other requirement, required for the dewatering of the dam spillway and stilling basin foundation galleries, shafts and other parts of the work and keep them free from water as required.
- 6.2.14** The contractor shall provide and maintain temporary bulk heads to protect shaft conduit for direct channel and other openings in the structure from possible flooding from any reason whatsoever, the cost of which shall be deemed to have been included under the item of care and diversion. The item and method of closure of the diversion channel and any other temporary openings shall be subject to the approval of the Engineer.
- 6.2.15** After having served their purpose diversion channel, temporary bulk heads, etc. shall be removed or be burnt as directed by the Engineer from time to time. The removal of the temporary works, bulk heads, etc shall be so arranged as not to damage the permanent works and any damage resulting from these operations shall be made good by the contractor to the satisfaction of the Engineer. Any reasonable inflow of water from the works in other reaches shall be diverted by the contractor as part and parcel of the item without any extra claim.
- 6.2.16** This item also includes maintaining pumping out and keeping the galleries dry from all water from the gallery, sump accumulated due to seepage, drilling or grouting or any other cause during the construction period and till all the works are finally handed over to the Government.

6.3 Use of Excavated Stuff :

The material available from the excavation of diversion channel shall be disposed as under

- 6.3.1** Rubble considered as useful by Engineer-in-charge for the work of masonry, or concrete of the weir and appurtenant works shall be sorted out, carted and stacked at locations indicated by the Engineer and shall not be allowed to be used for checkdam. The remaining materials of excavation excluding above can be used in the construction of diversion work, free of charges, such of the material found in excess over the required in the construction of diversion work, if found suitable in the opinion of the Engineer -in-charge shall be transported and laid in the permanent structure of dam and appurtenant works. Payment for depositing of suitable material stated for use in the permanent structures of dam and appurtenant works shall be carried under suitable items of depositations. No separate payment shall however be made for excavation work covered in the items of care and diversion.
- 6.3.2** The materials obtained from the dismantling shall be suitable disposed off as under. The materials found suitable to the Engineer-in-charge shall be carted and deposited in the structure of dam and appurtenant works which shall be paid under relevant item of deposition of excavated material.
- 6.3.3** The material not found useful shall be disposed off in downstream reach of river or such location as approved and directed by the Engineer-in-charge under no circumstances such materials shall be allowed to be dumped across the river so as to obstruct the flow of the river or endanger any

permanent structures or encroachment to the other works.

6.4 DEWATERING AND DIVERSION AS AND WHERE NEEDED:

The rates of the items in this tender also include arrangements for the diversion of water during construction in the fair weather as well as in the monsoon during the entire period of construction. No payment shall be made for any part of earth work, masonry work or any other work or materials washed away or damaged during the monsoon or other period and it will have to make good by the contractor at his own expenses. It is the responsibility of the contractor to make good by the contractor at his own expenses. It is the responsibility of the contractor to make good or repair any Government property, material or work damaged during construction period. No extra payment shall be paid for dewatering in any item of work under this contract.

The rates are also inclusive of all labour, materials and plant necessary for the purpose of dewatering and diversion mentioned therein.

6.4 MEASUREMENT AND PAYMENT:

No separate payment shall be made on account of Dewatering & Diversion of River / drain work.

Signature of Contractor

**Executive Engineer
Dharoi Canal Division No-3
Visnagar**

SECTION-6
FORMOFBID

FORM OF BID

Description of the Works:

-BID

To :

Address :

1. We offer to execute the Works described above and remedy any defects therein in conformity with the conditions of Contract, specification, drawings, Bill of Quantities and Addenda for the sum(s) of

 (-----)

2. We undertake, if our Bid is accepted, to commence the Works as soon as is reasonably possible after the receipt of the Engineer's notice to commence, and to complete the whole of the Works in the Contract within the time stated in the document.
3. We agree to abide by this Bid for the period of 120 Days from the date fixed for receiving the same, and it shall remain binding upon it and may be accepted at any time before the expiration of that period.
4. Unless and until a formal Agreement is prepared and executed this Bid, together with your written acceptance thereof, shall constitute a binding contract between us.
5. We understand that you are not bound to accept the lowest or any tender you may receive.

Dated this ----- day of ----- 20

Signature ----- in the capacity of -----

----- duly authorized to sign bids for and on behalf of -----

(in block capitals or typed)

Address

Witness

Address

Occupation

SECTION-7
BILLOFQUANTITIES

BILLOFQUANTITIES

Preamble

1. The bill of Quantities shall be read in conjunction with the Instructions to Bidder, Conditions of Contract, Technical Specifications and Drawings.
2. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices tendered in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix within the terms of the Contract.
3. The rates and prices tendered in the priced Bill of Quantities shall, except in so far as it is otherwise provided under the Contract, include all constructional plant, layout, supervision, materials, erection, maintenance, insurance, profit, taxes and duties, together with all general risks, liabilities and obligations set out or implied in the Contract.
4. The rates and prices shall be quoted entirely in Indian Currency.
5. A rate or prices shall be entered against each item in the Bill Quantities, whether quantities are stated or not. The cost of Items against which Contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities (in case of Item rate contract).
6. The whole cost of complying with the provisions of the Contract shall be included in the items provided in the priced Bill of Quantities, and where no Items are provided the cost shall be deemed to be distributed among the rates and prices entered for the related items of Work.
7. General direction and descriptions of work and materials are not necessarily repeated or summarized in the Bill of Quantities. Reference to the relevant sections of the contract documentation shall be made before entering rates or prices against each item in the Bill of Quantities.
8. The method of completed work of payments shall be in accordance with the specification for Road and Bridge works. For building works specifications for building are to be followed.
9. Errors will be corrected by the Employer for any arithmetic errors pursuant to **Clause 29** of the Instructions to Bidder.
10. Rock is defined as all materials which, in the opinion of the Engineer, required blasting, or the use of metal wedges and sledge hammers, or the use of compressed air drilling for its removal, and which cannot be extracted by ripping with a tractor of at least 150 kw with a single rear mounted heavy duty ripper.

BILLOFQUANTITIES**(A) PercentageRateTender(UptoINR50Cr.)**

Item No	DescriptionofItem(withbriefspecific ation and reference tobookofspecifications)	Quantity	Unit	Rate Infigure s	Amount (Rs.)
1	Excavation in all sort of strata and formations incl. depositing the unuseful excavated stuff as and where directed incl. sorting and stacking useful materials in measurable conditions as directed up to 200mt lead and all lift etc. complete inc. dewatering.(A) In overburden incl. Hard Murrum.	44975.00	Cum.	89.00	4002775.00
2	Providing and laying Non-Woven Geo Fabric Filter (weight more than 235 gm/Sq.mt.) over the excavated surface as per specification including stitching with overlap to design profile as directed in tidal range etc. complete.	1440.00	Sq.mt.	86.40	124416.00
3	Quarrying, transporting and laying inclined or horizontal sand filter of required gradation in earth dam in layers of specified thickness incl. required watering light rolling for all lead and lift etc. complete	288.00	Cum.	456.20	131385.60
4	Providing and supplying mechanically double twisted highly galvanized with (PVC) poly chloride coating gabions made of mesh size 10 x 12mm woven wire as per ASTMA-975-97 size of gabion 1 m x 1 m x 1 m including providing and laying stones in the gabions and arranging them in a required manner in th section of break water or such ither structure including quarrying, blasting, loading at quarry site, transporting at worksite and arrange in the gabions in workman like manner with required layer thickness and arranging this gabions in required layers with the crane of required capacity (If required, as per drawing or as directed) with all material, labour, tools etc. complete.	5000.00	No.	3069.80	15349000.00

5	Earthwork Backfilling with selected earth brought from outside borrow area or from excavated useful material incl, watering, ramming, compaction with pneumatic tamping with lead up to 1 km and all lift etc. complete	6843.00	Cum.	89.00	609027.00
6	Care and Diversion of river crick incl. required dewatering during construction of earth dam, COT, and allied works as prescribed and directed etc. complete	1 %	L.S.	202166.04	202166.04
Total Amount: -					20418769.64
Say Amount: -					20418770.00

I/We am/are willing to carry out the work at% above/below percent (Should be written in figures and words) of the estimated rate mentioned above. Amount of my/our tender works out as under.

Estimated amount put to tender

Estimated amount put to tender

Deduct.....% below

Add.....% Above

Net

Net

In words

In words

(B) — For Item Rate Tender (For above INR 50 Cr.):

Item No	Description of Item (with brief specification and reference to book of specifications)	Quantity	Unit	Rate		Amount
				In figures	In Words	

(A) Total Tendered Amount

(B) Rebate on above tendered amount (if any) % (in figure)

(in words)

(C) Net Tendered Amount (A-B) (in figure)

(in words)

#

1	The Contractor shall exhibit a board with brief details of work as directed by the Engineer-In-Charge for which no extra payments shall be made.
2	The labour cess will be deducted as per prevailing rules i.e. 1% of the work done.
3	GST and Income tax TDS will be deducted as a source while making payments of bills

4	<p>In all R.C.C. Items in Rate Analysis Standard Cement Consumption has been taken as per Govt. G.R.N O.: MIS 102010/17/K1 Dated: 30/07/2018 as stated in S.O.R. therefore in R.C.C. items where there is a change as per actual mix design the cost of difference of cement consumption have been deducted from the rate of original item at the rate of input rate mentioned in all the tender.</p>
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SECTION-8

SECURITIESANDOTHERFORMS

BID SECURITY (BANK GUARANTEE)

WHEREAS, ----- (name of Bidder) (hereinafter called the "The Bidder") has submitted his bid Dated ----- (Date) for the construction of ----- (Name of Contractor hereinafter called "the Bid")

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

SEALED with the Common Seal of the said Bank this ----- day of ----- 20

THE CONDITIONS of these obligations are:

(1) If after Bid opening the Bidder withdraws his bid during the period of Bid validity specified in the Form of Bid;

Or

(2) If the Bidder has been notified of the acceptance of his bid by the Employer during the period of Bid Validity:

A

Fails or refuses to execute the Form of Agreement in accordance with the Instructions to Bidders, if required; or

B. Fails or refuses to furnish the Performance Security, in accordance with the Instructions to Bidders; or

C. does not accept the correction of the Bid Price pursuant to Clause 27 (Correction of Errors)

We undertake to pay to the Employer up to the above amount upon receipt of his first written demand, without the employer having to substantiate his demand, provided that in his demand the Employer will not state that the amount claimed by him is due to him owing to the occurrence of one or any of the three conditions, specifying the occurred conditions or conditions.

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

DATE-----

SIGNATURE-----

WITNES -----

S

L

SEA

(Signature, name and address)

* The Bidder should insert the amount of the guarantee in words and
 figures denominated in Indian Rupees. This figure should be the same as shown
 in Clause 16.1 (Bid Security) of the Instructions to Bidders.

****45 days after the end of the validity period of the Bid.** Dates should be inserted by the Employer
 before the Bidding documents are issued.

PERFORMANCE SECURITY

TO,

----- (Name of Employer)
 ----- (Address of Employer)

WHEREAS ----- (name and address of
 contractor) (hereafter called "the Contractor") has undertaken, in pursuance of Contracts No. -----
 ----- dates ----- to execute -----
 ----- (name of Contract and brief description of Works) (hereinafter called
 "The Contract")

AND WHEREAS it has been stipulated by you in the said Contract that
 the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the
 sums specified therein as security for compliance with his obligation in accordance
 with the Contract.

AND WHEREAS we have agreed to give the Contractor such a bank Guarantee:

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible
 to you on behalf of the Contractor, up to a total of -----
 (amount of guarantee)* ----- (in words), such sum being payable in
 types and proportions of currencies in which the Contract price is payable, and
 we undertake to pay you, upon your first written demand and without cavil or argument, any sum or
 sums within the limit of -----
 (amount of guarantee) as aforesaid without your needing to prove or to show grounds or reasons
 for your demand and for the sums specified therein.

We hereby waive the necessity of your demanding the said debt from the
 contractor before presenting it with the demand.

We further agree that no change or addition to or other modification of the terms of the
 Contract or of the Works to be performed thereunder or of any of the Contract documents
 which may be made between you and the Contractor shall in any way release us from any
 liability under this guarantee, and we hereby waive notice of any such charge, addition
 or modifications.

This guarantee shall be valid until 60 days from the date of expiring of
 the Defect Liabilities period.

Signature and Seal of the guarantor -----

Name of Bank -----

Address -----

Date -----

*An amount shall be inserted by the Guarantor, representing the percentage of the Contract price
 specified in the Contract denominated in Indian Rupees.

ADDITIONAL PERFORMANCE SECURITY

[Clause 34.1.(A)]

TO,

----- (Name of Employer)
 ----- (Address of Employer)

WHEREAS ----- (Name and address of contractor) (hereafter called "The Contractor") has undertaken, in pursuance of Contract No. -----
 ----- dates ----- to execute -----
 ----- (Name of Contract and brief description of Works) (hereinafter called "The Contract")

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sums specified therein as security for compliance with his obligation in accordance with the Contract.

AND WHEREAS we have agreed to give the Contractor such a bank Guarantee:

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you on behalf of the Contractor, up to a total of -----
 (amount of guarantee) ----- (in words), such sum being payable in types and proportions of currencies in which the Contract prices is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limit of -----
 (amount of guarantee) as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sums specified therein.

We hereby waive the necessity of your demanding the said debt from the contractor before presenting it with the demand

We further agree that no change or addition to or other modification of the terms of the Contract to of the Works to be performed there under or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such charge, addition or modifications.

This guarantee shall be valid until **28 days** from the project completion date.

Signature and Seal of the guarantor -----

Name of Bank -----

Address -----

Date -----

BANK GUARANTEE FOR ADVANCE PAYMENT

TO,

----- (Name of Employer)

----- (Address of Employer)

----- (Name of Contractor)

Gentlemen:

In accordance with the provisions of the Conditions of Contract, sub-clause 51.1 ("Advance Payment") of the above mentioned Contract, -----
 ----- (name and address of Contractor) (hereinafter called
 "the Contractor") shall deposit with ----- (name of
 Employer) a bank guarantee his proper and faithful performance under the said Clause of the
 Contract in an amount of ----- (amount of Guarantee)*-
 ----- in words).

We, the ----- (bank or financial institution), as instructed
 by the Contractor, agree unconditionally and irrevocably to guarantee as primary obligator and not as Sur-
 etymere, the payment to -----
 (name of Employer) on his first demand without whatsoever right of obligation on our part and with-
 out his first claim to the Contractor, in the amount not exceeding ---
 ----- (in
 (amount of guarantee)* words)

We further agree that no change or addition to or other modifications of the terms
 of the Contractor or Work to be performed there
 under or of any of the Contract documents which may be made between -----
 -- (name of 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 modifications.

This guarantee shall remain valid and in full effect from the date of the advance payment
 under the Contract until ----- (name of employer) receives full
 repayment of the same amount from the contractor.

YOUR STRULY

Signature and Seal _____
 Name of Bank/Financial Institution _____
 Address _____
 Date _____

* An amount shall be inserted by that Bank or Financial Institution representing the amount of the Advance Payment, and denominated in Indian Rupees.

Letter of Acceptance
(Letterhead paper of the Employer)

_____ (date)

To, _____ (Name and address of the Contractor)

Dear Sirs,

This is to notify you that your Bid dated _____ for execution of the _____ (Name of the contract and identification number, as given in the Instructions to Bidders) for the Contract Price of Rupees _____ (_____) (amount in words and figures) as corrected and modified in accordance with the Instructions to Bidders* is hereby accepted by your agency.

You are requested to furnish performance security, in the form detailed in para 34.1 of ITB for an amount equivalent to Rs. _____ within **10 days** of the receipt of this letter of acceptance up to beyond **60 days** from the date of expiry of defects Liability period i.e. up to _____ and the Additional Performance Security for an amount equivalent to Rs. _____ shall be valid beyond 28 (twenty-eight) days of Project Completion Date i.e. up to _____ and sign the contract, failing which action as stated in Para 34.3 of ITB will be taken.

Yours Faithfully

Authorized
Signature Name and title of Signatory
Name of Employer

* Delete "Corrected and" or and modified if only one of these actions applies. Delete as corrected and modified in accordance with the Instructions to Bidders, if corrections or modifications have not been affected.

Issue of Notice to proceed with the work

(Letterhead of the Employer)

To, _____ (date)

_____ (Name and address of the Contractor)

Dear Sirs,

Pursuant to your furnishing the requisite security in ITB Clause 34.1 and signing of the Contract for the construction of _____

_____ at a bid Price of Rs.

_____.

You are hereby instructed to proceed with the execution of the said works in accordance with the contract documents.

Yours faithfully

(Signature, name and title of signatory authorized to sign on behalf of Employer)

AGREEMENT FORM

This agreement, made on the _____ day of _____ between _____ (name and address of Employer) (Hereinafter called "the Employer") and _____ (name and address of contractor) hereinafter called "the Contractor" of the other part.

Whereas the Employer is desirous that the Contractor execute

Name and identification number of contract (hereinafter called "the works") and the Employer has accepted the Bid by the Contractor for the execution and completion of such works and the remedying of any defects therein, at a cost of Rs.

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS

1. In this Agreement, words and expression shall have the same meanings as are respectively assigned to them in the conditions of contract hereinafter referred to and they shall be deemed to form and be read construed as part of this Agreement.
2. In Consideration of the payment to be made by the Employer to the contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the works and remedy any defects therein in conformity in all aspects with the provisions of the contracts.
3. The employer hereby covenants to pay the Contractor in consideration of the execution and completion of the works and the remedying the defects wherein 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.
4. The Following documents shall be deemed to form and be ready and construed as part of this Agreement viz
 - i) letter of Acceptance
 - ii) Notice to proceed with the works:
 - iii) Contractor's Bid

- iv) Conditions of contract: General and Special
- v) Contract Data
- vi) Additional conditions
- vii) Drawings
- viii) Bill of Quantities and
- ix) Any other documents listed in the Contract data as forming part of the Contract.

In witness whereof the parties thereto have caused this Agreement to be executed the day and year first before written

The Common seal of _____

Was hereunto affixed in the presence of :

Signed, sealed and Delivered by the said _____

In the presence of

Binding signature of Employer _____

Binding Signature of Contractor _____

UNDERTAKING (For Investment)

I, the undersigned do hereby undertake that our firm M/s
would invest a minimum cash up to **25%** of the value of the work during implementation of the contract.

 (Signed by an Authorized officer of the firm)

 Title of officer

 Name of firm

 DATE

UNDERTAKING (For Validity)

I, the undersigned do hereby undertake that our firm M/s.....
 agree to abide by this bid for a period..... days
 for date fixed for receiving the same and it shall be binding on us and may be accepted at any time before the
 expiration of that period.

 (Signed by an Authorized officer of the firm)

 Title of officer

 Name of firm

 DATE

SECTION-9
DRAWINGS

SECTION-10

DOCUMENTSTOBEFURNISHEDBYBIDDER