

STANDARD BIDDING DOCUMENT
PROCUREMENT OF
CIVIL WORKS
DRAFT TENDER PAPERS FOR

**Construction of Pipe Culvert bridge on Bhadar River at
various Location Near Village-Adval,,Ta- Dhandhuka,Dist-
Ahemdabad**

ESTIMATED COST RS.3605795.44

COMPLETE BIDDING DOCUMENT



GOVERNMENT OF GUJARAT
Narmada, Water Resources, Water Supply and Kalpsar Department

OFFICE OF THE
EXECUTIVE ENGINEER
AHMEDABAD IRRIGATION DIVISION
AHMEDABAD

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Volume-I

**INVITATION FOR BID
(IFB)**

NATIONAL COMPETITIVE BIDDING

1. The **Executive Engineer, Ahmedabad irrigation Division, Ahmedabad** invites bids for the construction of works detailed in the table. The bidders may submit bids for any or all of the following works.

TABLE

Sr. 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 Pipe Culvert bridge on Bhadar River at various Location Near Village- Adval,,Ta- Dhandhuka,Dist- Ahmedabad	3605795.44	37000.00	1500.00	6 Months (Including Monsoon)	Class-E1 and above

2. Prospective / Interested bidder may download the Bid Documents from website <https://www.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 **Ahmedabad and in favor of 'Executive Engineer, Ahmedabad Irrigation Division, Ahmedabad** Once the Bid is received online, Bid Document / Tender Fee will not be refundable. As Per GoG R&B Department's Circular No. PARACH/102/000/IB/221/(59)/C Dated.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 bidder shall send the same in original through R.P.A.D. so as to reach to **'Executive Engineer, Ahmedabad Irrigation Division, Ahmedabad** within 7 Days from the last day of bid submission.

Penaltative action for not submitting Demand Draft / FDR / Bank Guarantee in original to Executive Engineer / Tender Inviting Authority by bidder shall be initiated.

WRD GR No. PRC-102014-1-MICell-K.1 Dated: 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 bids will be opened on the next working day at the same time and venue.
5. ~~A pre bid meeting will be held onat hrs. at the office ofto 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 tender 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 above Rs. 7.5 crore (WRD Works), R s . 7.0 crore (ROAD/ BRIDGE/ BUILDING WORKS), Rs. 0.5 Crore (Electrical Works) kindly refer to GoG NWRWS & K Department's Circular No. Paracha/1097/1397(11)/pa.fa./ MICELL(k-1) dated 18/01/2018 and Dated 30/09/2022

For the works costing under 7.5 crore for Irrigation works and 7.0 crore for Building and Bridge Works 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
(Registration Certificate Under Renewal will not be accepted)
- ~~(iv) Registration Certificate of special category — Road/Building and Category I/II/III, if required~~
- (v) GST Numb and PAN No
- ~~(vi) Work Experience, if necessary...~~
- (vii) Power of Attorney - A power of attorney duly authorized by a notary public, if power is delegated for signing the bid persons other than applicant.
- (viii) Valid Bank Solvency Certificate of 20 % of Est. cost.
(Currant Calendar Year 2026, however Solvency Certificate of Previous Year will be considered vaild up to the end of March only,)
- (ix) The bidder shall upload geo-tagged photographs (showing latitude and longitude) of the site of the said work. In the absence of such photographs, the bid shall be liable for rejection.

Deputy Executive Engineer
Ahmedabad Irrigation Sub Division
Ahmedabad

Executive Engineer
Ahmedabad Irrigation Division
Ahmedabad

SECTION - 1
INSTRUCTIONS TO BIDDERS
(ITB)

Section 1: Instructions to Bidders

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A. GENERAL

1. Scope of Bid

- 1.1 The Employer **Executive Engineer, Ahmedabad Irrigation Division, Ahmedabad** invites bids for the Construction of Pipe Culvert bridge on Bhadar River at various Location Near Village-Adval,,Ta- Dhandhuka,Dist-Ahemdabad. 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, 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, 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 GoG NWRWS & 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) Subcontractors experience and~~

~~resources shall not be taken in to account in determining the applicants 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 works executed and the financial figure to a common base value for works completed in India:~~

Year	Financial Year	Multiplying factor
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 works 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 works 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 finical~~

~~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 calculations 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.~~

~~4.5.7. 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.~~

~~4.5.8. 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 years. A consistent history of awards against the Applicant or any partner of a joint venture may result in failure of the applicant.~~

~~4.5.9. 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.~~

~~4.5.10. 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. As per Pre qualification Criteria refers same documents~~

~~(a) Following are the minimum qualification requirements:-~~

~~(i) The lead partner 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 several 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*2-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 one year (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 the submitted in proof the qualification requirements; and / or Record of poor performance 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 unreasonably high bid prices 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 bidder shall upload geo-tagged photographs (showing latitude and longitude) of the site of the said work. In the absence of such photographs, the bid shall be liable for rejection.

The costs 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 he 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 be submitted by the bidder (refer Clause 8.1) shall be in two separate parts:

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

- (i) Bid Document Fee / Tender Fee
- (ii) Bid Security / EMD or Valid EMD Exemption Certificate of Appropriate Class of Registration of Approved Contractors (EMD /Exemption Certificate Under Renewal will not be accepted).
- (iii) Registration Certificate of Appropriate Class (Registration Certificate Under Renewal will not be accepted)
- (iv) GST Number & PAN No.
- (v) Power of Attorney - A power of attorney duly authorized by a notary public, if power is delegated for signing the bid persons other than applicant.
Bank Solvency (Currant Calendar Year 2024, however Solvency Certificate of Previous Year will be considered vaild up to the and of March only,).

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 Bidder shall submit the details / information pertaining to each part i.e. Preliminary 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 Price 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 Schedule 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 Bidders, if the Bidder fails the specified time limit to
 - (i) Sign the Agreement; or
 - (ii) Furnish the requirement 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 GoG R&B Dept's Gr. No. S/22/2017/6369/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 “Preliminary stage / ~~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 Financial 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 Process to be Confidential

- 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 Bidder 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. Examinations of Bids and Determination of Responsiveness

- 26.1 During the detail evaluation of " Preliminary stage / ~~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 in to 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 in to 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 his 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 Bidder 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 of the Defects Liability Period and the Additional Performance Security shall be valid beyond 28 (twenty-eight) days of Project Completion Date.

- 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, [Cl.1.1]
Ahmedabad Irrigation Division, Ahmedabad
2. ~~The last five years.~~
~~2022—2023~~
~~2021—2022~~
~~2020—2021~~
~~2019—2020~~
~~2018—2019~~
3. ~~This Annual Financial Turnover Amount is Rs.~~ [As per Pre-qualification Criteria]
4. Value of Work is Rs. **3605795.44**
5. ~~Deleted~~
6. ~~The cost of electric work is Rs 0~~
7. ~~The cost of water supply / sanitary works is Rs.~~
8. ~~Liquid assets and / or availability of credit facilities is Rs.193368.46~~ [Cl.4.5.6]
9. ~~Price level of the financial year 2023-24~~ [As per Pre-qualification Criteria]
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, AIPC, Ahmadabad on dt—— at 12:00 PM (If Possible)~~
12. Address of the Employer: Block-C, Ninth Floor, Multi Storey Building, Opp.Himalaya Mall, Vastrapur, Ahmedabad-380052.
13. ~~Deleted~~
14. The bid should be submitted latest by [Cl. 20.1 & 20.2]
As stated on online NIT
15. The bid will be opened at Executive Engineer, [Cl. 23.1]
Ahmedabad Irrigation Division, Ahmedabad As stated on online NIT
16. The Bank Draft in favor of Executive Engineer, Ahmedabad Irrigation Division, Ahmedabad
17. ~~Deleted~~
18. ~~Escalation factors (for the cost of works executed and financial figure to a common base-value) for works completed~~ [As per Pre-qualification Criteria]

<u>Year</u>	<u>Financial Year</u>	<u>Multiplying factor</u>
Base year of inviting tender	2023-2024	1.00
-1	2022-2023	1.10
-2	2021-2022	1.21
-3	2020-2021	1.33
-4	2019-2020	1.46

-5

2018-2019

1.61

#LIST OF KEY PLANT & EQUIPMENT TO BE DEPLOYED ON CONTRACT WORK

[Reference CL. 4.5.5]

The contractors shall also give a list of machineries in his possession and which they propose to use on the work.

Sr. No.	Plant or Machinery	Location	Age of Machinery (maximum m 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 As per Pre-Qualification Criteria refer same document)~~

(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 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.

Deputy Executive Engineer
Ahmedabad Irrigation Sub Division
Ahmedabad

Executive Engineer
Ahmedabad Irrigation Division
Ahmedabad

Lis of Key Personnel to be deployed on Contract work				
Sr. No.	Position	Professional Experience	Qualification	Nos.
1	Site Engineer	5 Year	Degree Engineering (Civil)	1
2	Site Supervisor	3 year	Diploma/Degree Engineering (Civil)	2

Deputy Executive Engineer
Ahmedabad Irrigation Sub Division
Ahmedabad

Executive Engineer
Ahmedabad Irrigation Division
Ahmedabad

SECTION - 2

QUALIFICATION INFORMATION

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 Work performed in the last five years (in Rs. Lakhs)

2022-2023

2021-2022

2020-2021

2019-2020

2018-2019

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 issue of work order	Stipulated period of completion	Actual date of completion*	Remark 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 a nominated sub-contractor, will also 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.~~

Year	Name of the work	Name of the Employer	Quantity of work performed (Cum/MT)				Remarks* (indicate contract Ref)
			Cement Concrete- (Including RCC & PCC)	Masonry	Earth Works	Bituminous Work	
2022-2023							
2021-2022							
2020-2021							
2019-2020							
2018-2019							

~~1.4 Information on Bid Capacity (works for which bids 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-Contract (Rs. Cr)	Stipulated-Period—of Completion	Value of Works* remaining to be completed (Rs. Cr)	Anticipated 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 Bidder 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 Experience- (General)	Year of experience in the proposed position
Etc.				

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

Sections of the works	Value of Sub-Contractor	Sub-Contractor (Name & 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 who may provide references if contacted by the Employer.~~
- ~~1.11 Information on Litigation history in which the Bidder is involved.~~

Other Party (ies)	Employer	Cause of Dispute	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 Bidder should attach descriptions, drawings and charts as necessary to comply with the requirements of the Bidding documents. (Refer ITB Clause 4.1)~~

- ~~1.14 Program~~

~~2. Deleted~~

3. Additional Requirements

- 3.1 Bidders should provide any additional information required to fulfill the requirements of Clause 4 of the Instructions to the Bidders, if applicable.

- (i) Affidavit
- (ii) Undertaking

* Fill the name of Consultant

Deputy Executive Engineer
Ahmedabad Irrigation Sub Division
Ahmedabad

Executive Engineer
Ahmedabad Irrigation Division
Ahmedabad

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

(CLAUSE 4.5.6 OF ITB)

BANK CERTIFICATE

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

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 works have 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
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

SECTION - 3
CONDITIONS OF CONTRACT

Conditions of Contract

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CONDITIONS OF CONTRACT

A. GENERAL.

- 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 Compensations 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) Contract Data
- (5) Conditions of Contract including Conditions of Contract
- (6) Specifications
- (7) Drawings
- (8) Bills of quantities and
- (9) Any other document listed in the Contract Data as forming part of the Contract.

3. Language and Law

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

4. Engineers Decisions

- 4.1 Except where otherwise specifically stated, the Engineer will decide contractual matters between the Employer and the Contractor in the role representing the Employer.

5. Delegation

- 5.1 The Engineer may delegate any of his duties and responsibilities to other people after notifying the Contractor and may cancel any delegation after notifying the Contractor.

6. Communications

- 6.1 Communications between parties which are referred to in the conditions are effective only when in writing. A notice shall be effective only when it is delivered (in terms of Indian Contract Act).

7. Sub-Contracting

- 7.1 The Contractor may subcontract any portion of work, up to a limit specified in contract data, with the approval of the engineer but may not assign the Contract without the approval of the Employer in writing. Subcontracting shall not alter the Contractor's obligations. **Sub-contracting of supply or specific items of work is not allowed.**
- 7.2 The sub-contractor must be registered in appropriate class and category for the part of work to be subcontracted.

8. Other Contractors

- 8.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities and the Employer between the dates given in the Schedule of other Contractor. The Contractors shall as refer to in the Contract Data, also provide facilities and services for them as described in the Schedule. The employer may modify the schedule of other contractors and shall notify the contractor of any such 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 Contractors 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 Contractors 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 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 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 **Executive Engineer, Ahmedabad Irrigation Division, Ahmedabad** 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 Executive Engineer, Ahmedabad Irrigation Division, Ahmedabad**
- (a) For the work up to Rs.100 Cr., if any of the parties is not satisfied with the decision of the **Executive Engineer, Ahmedabad Irrigation Division, Ahmedabad** both the parties have to refer to the Chief Engineer concern 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 Executive Engineer, Ahmedabad Irrigation Division, Ahmedabad 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 Disputers

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

26. Deleted

B. TIME CONTROL

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. QUALITY CONTROL

33. Identifying Defects/ Defect liability period

33.1 : Defect liability period : The contractor shall be responsible to make good and remedy at his own expense any defect which may develop or may be noticed before the period mentioned hereunder from the certified date of completion. The Engineer in charge shall give the contractor a notice in writing about the defects and the contractor shall make good the same within 15 days of receipt of 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 of the contractor. The Engineer-in-charge shall be entitled to appropriate the whole or any part of the amount of security deposit towards the expenses, if any, Incurred by him in rectification, removal or re-execution. The Defects Liability period shall be as under....

A. For works of WRD Except Building

- (A) For all works costing up to Rs. 50,000.00 (amount put to tender), the period shall be 3 Months from the certified date of completion.
- (B.1) For WRD works likes Checkdam / Canal / Drainage and road structure tender amount from Rs. 50,000.00 to Rs. 10,00,000.00 the period shall be 12 months from the certified date of completion.
- (B.2) For WRD works except likes Checkdam/ Canal/ Drainage and road structure tender amount from Rs. 50,000.00 to Rs. 10,00,000.00 the period shall be 6 months from the certified date of completion.
- (C.1) For WRD works likes Checkdam/ Canal/ Drainage and road structure tender amount more than Rs. 10,00,000.00, The defect liability period shall be 3 years from the certified date of completion.
- (C.2) **For WRD work except likes Check Dam/ Canal / Drainage / Road Structure tender amount from RS. 10,00,000 to 1 Crore, the defect liability period shall be 12 months from the certified date of completion.**
- (D) For all WRD works of tender amount more than RS. 1 Crore, the defect liability period shall be 3 Years from the certified date of completion

B. For Building works of WRD:-

For Building works of WRD, Follow the R&B Circular dated.03/12/2009

For original building works the defect liability period will be 4 years or elapse of 4 monsoon period following date of possession of building taken over by user agency following the certified date of completion, whichever is later.

For the purpose of deciding the monsoon period, the 30th September shall be treated as the last date.

WRD Circular No. Matas/102013/MICELL(K-1) Dated 13/12/2013

~~33.2 For Road works :-~~

~~Free maintenance guarantee period for works of Road/Bridge construction-~~

- ~~(a) For resurfacing work of road free maintenance guarantee period one year from the date of completion-~~
- ~~(b) In case of widening of the road/strengthening of the road/bridge, the contractor shall have to give four years free maintenance guarantee from the certified date of completion. During this period the contractor shall visit the site every six months along with the concerned Section Officer / Deputy Executive Engineer and will examine the work already carried out in this contract like road work, jungle cutting, side shoulders, side gutter, road furniture, patta etc. and will prepare Km-wise inspection report duly signed by all concerned and any defect observed shall be done within 15 days by the contractor at his risk and cost as per the direction of Engineer in charge. The contractor needs to do videography of these visits and require to submit at the time of release of FMG. If B.T. the surface during 47 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 incharge. 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 boards 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 Engineer 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 his cost, interrupt and divert the flow of traffic if such interruption and diversion is necessary for the efficient progress of works and conforms 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 the amount of work done for works upto Rs. 10 crore of estimate cost should be deducted from R.A. Bill of the contractor for testing the quality of material workmanship. Whereas for estimated cost of works 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. As Per GoG NWRWS & K Department's Circular No. PARCH/132023/401/MICELL Dated: 05/10/2023.
- 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 location 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 com input missioning 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 programs 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.
 - (i) 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 Executive Engineer as to the nearest comparable item shall be final and binding on the contractor.
 - (ii) If the rate cannot be derived in accordance with (i) above, such class of works 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.

- (iii) 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 program 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 Quantities completed.
- 42.5 The value of work executed shall include the valuation 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 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 payment 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
 $R = \text{Total value of work done during the month. It would include the amount of secured advance granted, if any, during the month less the amount of secured advance recovered, if any during the month. It will exclude value for works executed under variations for which price adjustment will be worked separately based on the terms mutually agreed.}$
- 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 day 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 everyday 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 the reason 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 Contactor 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 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 valuations 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 in Indian Rupees. The performance Security shall be valid until a date 60 days from the date of expiry of Defects Liability Period 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.

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 arises 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 the rebates 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 / "as built" drawings

- 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:

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
2. The Engineer instructs the Contractor to delay the progress of the Works and the instructions is not withdrawn within 28 days;
3. The Employer or the Contractor is made bankrupt or goes into liquidation other than for a reconstructions or amalgamation
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
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;
6. The Contractor does not maintain a security which is required;
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
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 artificial non-competitive levels and to deprive the Borrower of the benefits 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 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 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/bye laws/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 damage 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 to 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 promotions etc.
- I) **Payments of Bonus Act 1965** :- The Act is applicable to all establishments employing 20 or more employees. The Act provides for payments 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 process 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 upto 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 constructions 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 earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power 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 thereof 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 **Executive Engineer, Ahmedabad Irrigation Division, Ahmedabad** (Higher Authority) 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 **Executive Engineer, Ahmedabad Irrigation Division, Ahmedabad**

24.2

- (a) For the work up to Rs.100 Cr., if any of the parties is not satisfied with the decision of the, **Executive Engineer, Ahmedabad Irrigation Division, Ahmedabad** both the parties have to refer to the **Superintending 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, Ahmedabad Irrigation Project Circle, Ahmedabad** 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.

Deputy Executive Engineer
Ahmedabad Irrigation Sub Division
Ahmedabad

Executive Engineer
Ahmedabad Irrigation Division
Ahmedabad

SECTION - 4
CONTRACT DATA

#CONTRACT DATA

Item marked "N/A" do not apply to this Contract.

Clause Reference With
respect To section 3

1. The Employers is [CL.1.1]
Name: Executive Engineer
Address: Office of Executive Engineer
Ahmedabad Irrigation Division, Block-C, Ninth Floor, Multy Storey
Building, Opp.Himalaya Mall, Vastrapur, Ahmedabad-380052
Name of authorized Representative (will be intimated later)
2. The Engineer is Executive Engineer
Name of Authorized Representative: **Deputy Executive Engineer,**
Ahmedabad Irrigation Sub Division, B-BLOCK, 2Nd FLOOR,
M.S.BUILDING,LAL DARWAJA, AHMEDABAD- 01
3. The Defects Liability Period is **12 months** Months from the date [CL.1.1&33]
of
completion.
4. The Start Date shall be **1st** days for the date of issue of the Notice [CL.1.1]
to proceed with the work.
5. The Intended Completion Date for the whole of the works is [CL.1.1,17&2]
6 Months (Including Monsoon)after start of work with the
following milestones:
Milestone dates: [CL.2.2& 49.1]
Physical works to be completed Period from the start date
Milestone 1 i.e. 10 % 40 days.
Milestone 2 i.e. 35 % 90 days.
Milestone 3 i.e. 75% 140 days.
Milestone 4 i.e. 100% 180 days.
6. The Site is located at village:-Adval,Ta.Dhandhuka,Dist.Ahmedabad [CL.1.1]
7. The name and identification number of the Contract is: [CL.1.1]
8. The works consist of Earth work,Excavation,Concrete work,pipe [CL.1.1]
laying work with items as per B.O.Q. The works shall include the
following, as Specified or as directed:

(B) Canal works

Site clearance; setting – out and layout; carry out required earthwork as suggested by Engineer also to carry out levelling PCC work, Dry rubble pitching work, RCC work, Fusion Bonded Epoxy Coated reinforcement laying and centering as per approved drawings provided by Engineer all as per item specifications 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) Other Items

Any Other Items as required to fulfill all contractual obligations as per the Bid documents.

- ~~10. The following documents also form part of the Contract:~~
~~Pre-qualification criteria As per clause 2-3~~ ~~[CL.1.1]~~
- [CL.2.3(9)]
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 dates shall be work order date [CL.21]
19. The period for submission of program (QAP) for approval of the engineer shall be 21 days from the issue of Letter of Acceptance. [CL. 27.1]
20. The period between program updates will be 45 days. [CL.27.3]
21. The amount to be withheld for late submission of an updated program shall be Rs 0.5 lakhs [CL. 27.3]
22. The following events shall also be Compensation Events [CL. 44]
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 to 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. 46]

The formula (e) for adjustment of prices are as under:

[CL.4

- 2 • If any of the commodities like Cement, Steel or Bitumen are not found
4. 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%.

7]

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 labour component of the work.

Adjustment for cement component.

(ii) Prices 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 bid 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 changes 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 Rebars** has been chosen to represent the steel group.

Adjustments 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 spare 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	15.00%
2. Cement - P_c	17.86 %
3. Steel - P_s	00.00%
4. Bitumen - P_b	00.00 %
5. POL - P_f	20.57 %
6. Plant & Machinery Spares P_p	17.71 %
7. Other Materials - P_m	28.86 %

Total	100 %

Note :- The price adjustment as per clause-47 will be decided at the time of estimation of actual work.

25. The proportion of payments retained (retention money) shall be 6% {CL. 48} from each bill subject to a maximum of 5% of final contract price.
26. Amount of Liquidated damages for in completion of works
- For Whole of work {CL.49} delay $(1/2000)^{th}$ of the Initial contract price, rounded off to the nearest Thousand, per day. For sectional Completion (wherever specified In item 5 of Contract data) $(1/2000)^{th}$ of amount of work done in that particular section, rounded off to the nearest thousand per day.

27. Maximum limit of liquidated damages For delay in completion work 10 percent of the Initial {CL. 49} Contract Price rounded off to the nearest thousand

28. ~~Amount of Bonus for early completion~~ ~~Amount of bonus for early completion of work shall be given as per CL.50 of Section-3~~

29. ~~Maximum limit of bonus for early Completion of work~~ ~~5 percent of the Contract {CL. 50} Price~~

30. ~~The amount of the advance payment are: {CL. 51 & 52}~~

#Nature of Advances **Amount (Rs.)** **Conditions to Be fulfilled**

i ~~Mobilization~~ ~~2.5% of the contract Price~~ ~~On submission of unconditional Bank Guarantee. (to be drawn before the end of 20% of the contract period). The contractor may furnish One bank guarantees of 2.5 % of each valid for the full period.~~

ii ~~Equipment~~ ~~50% for new and 25% 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~~ ~~Deleted~~
~~Advance for~~
~~Non-persish~~
~~able material~~
~~Brought to site~~

~~(The advance payment will be paid to the Contractor no later than 28 days after fulfillment of the above conditions).~~

31. **Repayment of advance payment for mobilization and equipment** {CL. 51.3}

The advance loan shall be repaid with percentage deduction from the interim payments certified by the Engineer under the Contract. Deduction 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 amounts 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. 52}

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. 58}~~

~~35. The date by which “as built” drawings (in scale as directed) in 2 sets {CL. 58} 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 required is Rs 1.0 lakhs~~

37. The following events shall also be fundamentals 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 Works shall be 20 per cent.

Deputy Executive Engineer
Ahmedabad Irrigation Sub Division
Ahmedabad

Executive Engineer
Ahmedabad Irrigation Division
Ahmedabad

Volume - II

SECTION - 5
TECHNICAL SPECIFICATION

GENERAL TECHNICAL SPECIFICATIONS

GENERAL TERMINOLOGY:

- 1) Agency shall quote the rate considering situation of stagnation of water in the drain. Agency must visit the site before quoting the rates. The above work may be even done by agency in water flooding condition in drain if needed and as directed by Engineer In Charge.**
- 2) In the specification, "As Directed"/" Approved" shall be taken to mean, "As directed"/" Approved" by the Engineer-in-charge.**
- 3) Wherever reference to any Indian Standards appears in the specifications, it shall be taken to mean as a reference to the latest edition of the same in force of the date of agreement.**
- 4) In "Mode of Measurement" in the specification wherever a dispute arise in the absence of specific of a particular poi to respects the provision on these particular points or aspects in the relevant Indian Standards shall be referred to.**
- 5) All measurements and computations unless otherwise specified shall be carried out to the following limits.**

i)	Length, width and depth (height)	0.01 mt
ii)	Areas	0.01 Sq.mt.
iii)	Cubic contents.	0.01 Cu.mt.

In recording dimension of work, the sequence of length width and height (depth) or thickness shall be followed.
- 6) The distance which constituted lead shall be determined along the shortest practical out e and not necessarily the route actually taken. The decision of the Engineer-in-charge in this regard shall be taken as final. Where no lead is specified, it shall mean "All leads"**
- 7) Lift shall be measured from lowest ground level where no lift is specified it shall mean "All lift"**
- 8) Approval to the samples of various materials given by the Engineer-in-charge shall not absolve contract or from the responsibility of replacing the defective material brought on site or materials used in the work found defective at a later date. The contractor shall have no claim to any payment or compensation whatsoever because of such materials being rejected by the Engineer-in-charge.**
- 9) The contract rate of the item of work shall be for the work completed in all respect.**
- 10) No collection of materials shall be made before it is got approved by the Engineer-in-charge.**
- 11) Collection of the approved materials shall be done at site of work in a systematic manner. Materials shall be stored in such a manner as to prevent damage, deterioration or instruction of foreign matter and insure the reservation of their quality and fitness for the work.**
- 12) Material if and when rejected by the Engineer-in-charge shall be immediately removed from the site of work.**
- 13) No material shall be stored prior to, during and after execution of a work in such a way as to cause or lead to damage or overloading of the various components of the structure.**
- 14) All work shall be carried out in a workman like manners per the best techniques for the particular item.**
- 15) All tools, templates, machinery and equipment for correct execution of work as well as for checking lines, levels, alignment of the work during execution shall be kept in sufficient nos. and in good working condition on the site of work by the contractor.**

- 16) The mode, procedure and manner of execution shall be such that it does not cause damage or overloading of the various components of the structure during execution or after completion of the structure.
- 17) Special modes of construction not adopted in general engineering practice, if proposed to be adopted by the contractor shall be considered only if the contractor provides satisfactory evidence that such special mode of construction is safe, sound and helps in speedy construction and completion of the work to the required strength and quality. Acceptance of the same by the Engineer-in-charge shall not however, absolve the contractor of the responsibility of any adverse effects and consequences of adopting the same in the course of execution or completion of the work.
- 18) All necessary safety measures and precaution (including those laid down in various relevant Indian Standards) shall be taken to insure the safety of materials and machinery on the works as also of the work itself.
- 19) Approval to any or the executed items for the work done correct in any way earlier than the contractor's responsibility of its correctness, soundness and strength of the structure as per the drawing and specification.
- 20) The cement to be used for this work shall only be (Grey) Ordinary Portland cement.
- 21) All the material, labors required for the specimen of test and testing charges shall be borne by the contractor. Necessary arrangement for conveying the samples up to the laboratory shall be provided by the contractor.
- 22) Curing shall be carried out as mentioned in the detail specification. In case of further new work over the previously carried out cement work, the curing on the superficial work shall be continued, accordingly and sufficiently.
- 23) The earthen embankment work by suitable material and shall be collected by borrow area.
- 24) No machine or surface vibrator shall be given or arranged by the department.
- 25) The curing method shall be got approved from the Engineer-in-charge.
- 26) Necessary material and labors required from the control and checking of the geometrical parameters of the work shall be provided by the contractor.
- 27) In case of failure of providing satisfactory curing arrangement, the department will arrange for the same, after giving only one-hour notice only for once. On failure of not providing satisfactory arrangement the department provided the same and the charges will be deducted from the bills of the contractor.
- 28) The stacking of the material required for the work shall be done in such a way as not to obstruct the vehicular traffic of every kind.

The work in general shall be carried out in workmanlike manner as well as to the correct section, better and gradient as per drawing and to the entire specification and as directed by Engineer-in-charge in presence of his authorized representative. 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 work. The work shall be carried out as per the specifications written specially for the item of the work and in case of conflict in the specification the work shall be carried out as per specification given in P.W.D. hand book Vol. I and II and or as per relevant latest ISI standards. The contractor or his authorized agent shall sign the working cross sections as well as field books etc. in token of acceptance prior to starting the work. No dispute in regard of acceptance levels shall be entertained at a later stage. During course of execution of this work the contractor shall have to remove the sitting or accumulation of such

materials that might have accumulated due to any reason. No extra payment shall be made in the contractor on his account.

- 29) The field testing of the material to be tested in the field laboratory / site laboratory established at the site of work.

30) Care and Diversion

1.0 CARE AND DIVERSION OF RIVER INCLUDING DEWATERING GENERAL:

- 1.01 The area under all permanent work and the adjoining areas, if necessary shall be maintained free from water.
- 1.02 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. Weir 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.
- 1.03 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 weir 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 coffer dam, diversion channel and other diversion 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 **Concrete** structure 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.
- 1.04 The care and diversion work shall have to be reckoned and provided for any eventualities like unseasonal floods etc.
- 1.05 Preliminary thought has been given to the diversion works and it is visualized that diversion channel together with an upstream and downstream coffer dam may be required to divert the post monsoon flow. The diversion is likely to be required for a period of two 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.
- 1.06 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.
- 1.07 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.
- 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.

- 1.08 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.
- 1.09 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.
- 1.10 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 coffer dam etc. 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, coffer dam, location of pumps and their capacity methods of dewatering etc.
- 1.11 Approval of the plans for the diversion works by the Engineer will not relieve the contractor from the responsibility for the adequacy there of 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.
- 1.12 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.
- 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 include 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.
- 1.13 After having served their purpose the coffer dam, 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 form these operations shall be made good by the contractor to the satisfaction of the Engineer. Any reasonable in flow of water from the works in other reaches shall be diverted by the contractor as part and partial of the item without any extra claim.
- 1.14 This item also include 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.
- 1.15 Use of Excavated Stuff :**
- The material available from the excavation of diversion channel shall be disposed as under:
- 1.15.1 Rubble considered as useful by Engineer-in-charge for the work of masonry, or concrete of the weir and appurtant works shall be sorted out, carted and stacked at locations indicated by the

Engineer and shall not be allowed to be used for coffer dam. The remaining materials of excavation excluding above can be used in the construction of coffer dam, free of charges, such of the material found in excess over the required in the construction of coffer dams, if found suitable in the opinion of the Engineer -in-charge shall be transported and laid in the permanent structure of dam and appurtant works. Payment for depositing of suitable material stated for use in the permanent structures of dam and appurtant works shall be carried under suitable items of depositions. No separate payment shall however be made for excavation work covered in the items of care and diversion.

- 1.16 The materials obtained from the dismantling of coffer dam 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 appurtant works which shall be paid under relevant item of deposition of excavated material.

The material not found useful shall be disposed off in down stream reach of river or such location as approved and directed by the Engineer-in-charge under no circumstances such materials shall be allowed to dumped across the river so as to obstruct the flow of the river or endanger any permanent structures or encroachment to the other works.

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.

Deputy Executive Engineer
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DETAIL TECHNICAL SPECIFICATION

ITEMWISE SPECIFICATION

M-1 WATER:-

- 1.1 Water shall not be salty or blackish and shall be clean, reasonably clear and free from objectionable qualities of silt and trace of oil injuries alkalis, salts, organic matter and other deleterious material which will either weaken the mortar or concrete or cause efflorescence or attack the steel in R.C.C. Container for transport, storage and handling of water shall be clean.
- 1.2 If required by Engineer-in-charge it shall be tested by comparison with distilled water. Comparison shall be made by means of standard cement test soundness, time of setting and mortar strength. Any indicator of unsoundness, change in time of setting by 30 minutes or more or decrease of more than 10% in strength of mortar prepared with water samples when compared with mortar prepared with the result obtained with mortar prepared with distilled water shall be sufficient cause for rejection of water under test.
- 1.3 Water for curing mortar, concrete or masonry should not be too acidic or too alkaline. The PH value of water shall be in between 7 to 8. It shall be free of elements which significantly affect the hydration reaction or otherwise interfere with the hardening of concrete during curing or those which produce objectionable stains or other unsightly deposits on concrete or mortar surface.
- 1.4 Hard and bitter water shall not be used for curing.
- 1.5 Potable water will be generally found suitable for curing mortar or concrete.

M-2 SAND:-

- 2.1 Sand shall be natural sand, clean, well graded, hard strong durable and gritty participle free from injurious amounts of dust clay, kankar, nodules, soft or flaky particles shale, alkali, salts organic matter, loam, mica or other deleterious substance and still be got approved from the Engineer-in-charge. The sand shall not contain more than 5% of silt as

determined by field test. If necessary, the sand shall be washed to make it clean.

2.2 COARSE SAND:-

The fineness modules of coarse sand shall not be less than 2.5 and shall not exceed 3. The sieve analysis of coarse sand shall be as under as per I.S. 383.

I.S. SIEVE DESIGNATION	PERCENTAGE BY WEIGHT PASSING SIEVE
4.75 mm.	100
2.36 mm.	90 to 100
1.18 mm.	70 to 100
600 Micron	30 to 100
300 Micron	5 to 70
150 Micron	0 to 50

M-3 CEMENT:-

- 1.1. Cement shall be used for the work, shall be ordinary Portland cement confirming to Indian standard "specification for ordinary and low heat Portland cement I.S.269. The cement shall be procured by the contractor. The contractor shall take every precaution to store cement properly, so that it may not spoiled by dampness etc. Cement required for use shall be as fresh as possible and stored on wooden planks raised 15 to 20 cm. above the floor and stacked 20 cm. away from the wall in suitable closed weather proof godown at the site of work. Necessary delivery challan and or bill from authorized dealer or manufacturing company or authorized supplier shall be produced before making payment. The cement shall be of recognized brand or company having production capacity of 2000 M.T. per day.
- 1.2. Cement shall be stored in such a way so as to allow the removal and use of cement in chronological order of receipt i.e. first received being first used. Nor more than 15 bags shall be stacked vertically in one pile and width of the piles shall not be more than 3 meters. Any cement which has deteriorated or which has set or partially set shall not be used in the work.

1.3. TESTING OF CEMENT:-

The cement brought to the site for use in the work shall be tested for its compressive strength and setting time before its use in the work in accordance with Indian standard method or physical tests for hydraulic cement IS 4031. The compressive strength of cement shall be as under.

Type of Cement	Strength in Kg/Cm ²		After 28 days
	3 days	7 days	
Ordinary Portland Cement	100	220	--
Portland Puzolona cement	-	220	310

For setting time of cement shall be as under:-

Type of Cement	Minimum Initial time in minutes	Maxinyn setting time in minutes
Ordinary Portland Cement	30	600
Portland Puzolona cement	30	600

Frequency of collection and testing of cement for compressive strength and setting time shall be at least one for each of 50 tones and at least once from each consignment of less than 50 tones.

M-4 GRAVEL OR BROKEN METAL AS COARSE AGGREGATE:-

- 4.1. Broken metal as coarse aggregate shall be of machine crushed of black trap or equivalent hard rock. The coarse aggregate shall be hard, strong, dense, durable, clean and free from skin and coating likely to prevent proper adhesion of mortar.
- 4.2. The aggregate shall generally be cubical in shape. Aggregate shall have no deleterious reaction with cement. The size of coarse aggregate for plain cement concrete and ordinary reinforced cement concrete shall be as per table given below. However in case of reinforced cement concrete the maximum limit may be restricted to 6 mm. less than the minimum lateral clear distance between bars or 6 mm. less than cover, whichever is smaller.

I.S. Sieve Designation	Percentage Passing for single sized aggregate of 40mm	Percentage Passing for single sized aggregate of 20mm	Percentage Passing for single sized aggregate of 16mm	I.S. Sieve Designation	Percentage Passing for single sized aggregate of 40mm	Percentage Passing for single sized aggregate of 20mm	Percentage Passing for single sized aggregate of 16mm
Nominal				Sized			
80 mm	-	-	-	12.5 mm	-	-	-
63 mm	100	-	-	10 mm	0 to 5	0 to 20	0 to 30
54 mm	85 to 100	100	-	4.75 mm	-	0 to 5	0 to 5
20 mm	0 to 20	85 to 100	100	2.36 mm	-	-	-
16 mm	-	-	85 to 100	-	-	-	-

NOTE:

This percentage may be varied some what by the Engineer-in-charge. When consider necessary for obtaining better density and strength of concrete.

- 4.3. The gradation test shall be taken in the beginning and at the change of source of materials. The necessary test indicated in IS-383 and IS-456 shall have to be carried out to ensure the acceptability. The aggregate shall be stored separately and handled in such a manner as to prevent the inter mining of different aggregates. If the aggregates are covered with dust they shall be washed with water to make them clean.

ITEM NO.1

Excavation in all sorts of soil (including wet and slushy condition of soil) with yellow, sandy, gravelly soil including soft murrum & H.M. including sorting & stacking and depositing the excavated stuff in uniform layers as and where directed upto lead of 30 mt. and lift as shown below including clearing the site etc. complete.(Including dewatering) (a) 0 to 3 Mt. depth.

The site shall first be cleared of all vegetation rubbish loose stones, etc. all roots of trees shall be dug cut, and stacked where directed for which no extra payment shall be made.

Excavated Stuff shall be removed as per approved section to the required depth, widths and slopes. The removal of Excavated Stuff shall be done uniformly and as per the instructions of the Engineer-in-Charge of the work.

The bed levels excavated throughout the drain/canal length shall confirm to the true line and levels and will be according to the dimensions given on drawing and as per the instructions of the Engineer-in-charge of the work. The excavation done beyond given line and level is not payable.

Before starting the work, measurement shall be taken of existing drain/canal will be taken longitudinally at every 30 m or at smaller interval. The initial measurement will be taken in the presence of the contractor or his authorized agent. During execution of work the cross ridges shall be kept for at every 30 mt. or at smaller interval as per instruction of Engineer in Charge. When the work is completed as per specifications the final measurements shall be taken at every 30 mt. or smaller interval which measurement were taken in the presence of the contractor or his authorized agent.

The cross ridges shall be removed from the drain/canal after the final measurements are recorded and as per instructions of the Engineer-in-Charge. Removed earth shall be uniformly laid over or behind the banks as per instructions, of Engineer-in-charge. No extra payment shall be made for removal of cross ridges.

Any damage caused to the drain/canal structures, bed stones due to the negligence of contractor shall have to be made good by the contractor for which no extra payment shall be made.

Excavation carried out beyond designed levels and section will not be paid for.

The excavated stuff shall be utilized for preparing or raising banks by depositing the same uniformly after breaking clods as and where directed. The work shall be strictly carried out according to the profiles given. The excavated stuff shall be evenly spread to level inspection path or service road in line & level as lined out. The side slopes for the banks shall be neatly dressed to designed slopes to given neat appearance.

All the excavated stuff surplus to the requirement for service road and inspection path shall be deposited for spoil bank as per instruction of the Engineer-in-charge without any extra cost. The rate included is for 30 m lead and 3.0 m. lift. Lift shall be considered from average ground level to top of a service road or inspection path. For additional lead & lift separate rate shall be paid as per rules. Wherever necessary. The rate is inclusive of working in wet condition & slushy muddy condition.

For the purposes of measurements, initial survey by levels shall be carried out of the whole area of excavation along cross sections spaced 30m. apart. Levels shall be taken every 30 m. along these cross section (in this case chainage zero will be at the axis). Bench marks established for those cross sections shall be maintained throughout the works by permanent pillars and this grid will form the basis of all excavation measurement. The cross section for the whole area of excavation shall be taken in the manner stated at the start of work and also as and where the site changes.

The quantity shall be computed from the cross sectional areas by the trapezoidal formula only. The contractor shall have to sign cross section in token of the acceptance of the correctness of the working ground levels before commencing work and also at the end of the work is taken of the respective foundation level.

The rate for the respective excavation of entire work and all depth and disposal of excavated stuff as desired in these specifications. The measurement will be computed by putting the actual excavated levels and the original ground or rock level and calculating the area between the original and excavated line.

No payment shall be made for any silt debris etc. that might accumulate in excavation pits during monsoons or summer showers or otherwise on any account and the removal thereof shall be deemed to have been included in the tendered rates for the main items.

No claim for extra rate shall be entertained for any excavation in over burden and rock that may be required to be done for widening or deepening the foundations. Consequent upon lowering of foundation below those shown in the drawings. The work so done shall be paid at the rates as specified in the tendered item. The rates are inclusive of all lifts and leads and dewatering as required up to completion of entire work.

The quantity shall be paid on cubic meter basis.

General

Any soil which generally yields to the application of pickaxes and shovels, phawaras, rakes or any such ordinary excavating implement or organic soil, gravel, silt, sand turf, loam, clay, peat etc., fall under this category.

Setting out:

After clearing the site, the center lines will be given by the Engineer-in-charge. The contractor shall assume full responsibility for alignment, elevation and dimension of each and all parts of the work. Contractor shall supply labours, materials, equipment's etc. as required for setting out the reference marks and bench marks and shall maintain them as long as required and directed.

Excavation:

The excavation in foundation shall be carried out in true line and level and shall have the width and depth as shown in the drawings or as directed. The contractor shall do the necessary shoring and strutting or providing necessary slopes to a safe angle, at his own cost. The bottom of the excavated area shall be levelled both longitudinally and transversely as directed by removing and watering as required. No earth filling will be allowed for bringing it to level, if by mistake or any; other reason excavation is made deeper or wider the extra depth or width shall be made up with concrete of same proportion as specified for the foundation concrete at the cost of the contractor.

Disposal of the excavated stuff:

The excavated stuff of the selected type shall be used in filling the trenches and plinth or levelling the ground in layers including ramming and watering etc.

The balance of the excavated quantity shall be removed by the contractor from the site of work to a place as

directed with lead up to 30 M. and all lift.

Mode of measurement and payment:

The measurement of excavation in trenches for foundation shall be made according to the sections of trenches shown on the drawing or as per sections given by the Engineer-in-charge.

For the purposes of measurements, initial survey by levels shall be carried out of the whole area of excavation along cross sections spaced 30m. apart. Levels shall be taken every 30 m. along these cross section (in this case chainage zero will be at the axis). Bench marks established for those cross sections shall be maintained throughout the works by permanent pillars and this grid will form the basis of all excavation measurement. The cross section for the whole area of excavation shall be taken in the manner stated at the start of work and also as and where the site changes.

The quantity shall be computed from the cross sectional areas by the trapezoidal formula only. The contractor shall have to sign cross section in token of the acceptance of the correctness of the working ground levels before commencing work and also at the end of the work is taken of the respective foundation level.

No payment shall be made for surplus excavation made in excess of above requirements or due to slopping and sloping back as found necessary on account of conditions of soil and requirements of safety.

The rate shall be for a unit of one cubic meter.

ITEM NO.2

Providing and laying foundation concrete of proportion as under by using cement, sand and machine crushed course aggregate laid in situ including necessary temping, smooth finishing, watering and curing as directed with all leads and lifts etc complete.

(a) PCC 1:3:6 (MSA 40)

Materials:

Water, Sand, Cement shall conform to M-1, M-2, and M-3 respectively. Coarse aggregate 40 mm.

Workmanship:

General:

Before starting concrete bed of foundation trenches shall be cleared of all loose materials, leveled, watered and rammed as directed.

Proportion of Mix:

The Proportion of cement, sand and coarse aggregate shall be 1 part of cement, 3 parts of sand, 6 parts of stone aggregates and shall so measure by volume.

Mixing :

The concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing may however be allowed for smaller quantity of work if approved by the Engineer-in-charge. When hand mixing is permitted by the Engineer in- charge in case of break-down of machineries and in the interest of the work, it shall be carried out on a water tight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in color and consistency. However, such cases 10% more cement than otherwise required shall have to be used without any extra cost. The mixing in mechanical mixer shall be done for a period 1 to 2 minutes. The quantity of water shall be sufficient to produce a dense concrete of required workability for the purpose.

Transporting & Placing the concrete:

The concrete shall be handled from the place of mixing to the final position in not more than 15 minutes by the methods directed and shall be placed into its final position, compacted and finished within 30 minutes of mixing with water i.e. before the setting commences.

The concrete shall be laid in layers of 15 cms. to 20 cms.

Compacting:

The concrete shall be rammed with heavy iron rammers and rapidly to get the required compaction and allow all the interstices to be filled with mortar.

Curing:

After the final set, the concrete shall be kept continuously wet, if required by ponding for a period of not less than 7 days from the date of placement.

Cement Level:

220 kg/cum. Of concrete.

In case of actual use being less than the cement level specified in the above, the Govt. shall deduct the cost of cement from the bill at Input rate per M.T. In case actual use of cement being more than specified above no extra payment for additional cement level shall be made and contractor shall have to bear addition cost. In no case, cement level shall be less than the provisions mentioned in the above.

Mode of measurement and Payment:

The concrete shall be measured for its length, breadth and depth/thickness, limiting dimensions to those specified on plan or as directed.

The payment shall be made as per cubic meter basis for the work actually done.

ITEM NO.3:

Providing and laying C.C. 1:2:4 grade using cement,sand and crushed metal including providing and erecting necessary form work, centering , vibrating, smooth finishing,watering and curing as directed with all leads and lifts etc.complete .

(a)sub structures (MSA20)

Material

Material Specification for Water (M-1), Sand (M-2), Cement (M-3), Grit (M-4), Coarse Aggregate (M-5) shall conform.

Strength Requirement of Concrete

The compressive strength requirements for the various mixes by concrete shall be as follows.

Type of concrete of 150 mm cubes	Minimum compressive strength in N/mm ²	
	7 Days	28 days
C.C. 1:2:4	10.0 N/mm ²	15.0 N/mm ²

Size of Metal

Unless otherwise specified by the Engineer-in-charge the maximum size of metal for different type of concrete shall not exceed the limits given below. However in case of reinforced cement concrete the maximum limits shall be restricted to 6 mm less than the minimum lateral clear distance between bars or 6mm less than the cover whichever is smaller.

Class of work	Nominal size of metal
1. R.C.C. work	20 mm
2. Ordinary plain concrete	40 mm / 20 MSA
3. Foundation concrete	40 mm
4. Mass concrete	40 mm

Grading of Metal

The metal shall be well graded. Their grading of the above sizes shall be within the limits as given in table below:

I.S.SIEVE DESIGNATION	PERCENTAGE PASSING FOR SINGLE SIZED AGGREGATE OF NORMAL SIZE	
	40 mm	20 mm
63 mm	100	-
40 mm	85 - 100	100
20 mm	0 - 20	85 - 100
16 mm	-	-

10.0 mm	0 - 5	0 – 20
4.75 mm	-	0 – 5
2.35 mm	-	-
2.35 mm	-	-

Percentage mentioned above may be varied somewhat by the Engineer-in-Charge when considered necessary for obtaining better density and strength of concrete.

Controlled Concrete

Concrete mix shall be designed on the basis of preliminary tests. The proportion of ingredients shall be such that concrete has adequate workability for conditions prevailing on the work in question and can be properly compacted with the means available.

Except, it can be shown to the satisfaction of the Engineer-in-charge that supply of properly graded aggregate of uniform quality can be maintained till the completion of work. grading of aggregate shall be controlled by obtaining the coarse aggregate in different sizes and blending them in the right proportions as required different sizes however shall be stacked in separate stock piles Required quantity of material shall be stock piled several hours preferably a day before use. Grading of coarse and fine aggregates shall be checked as frequently as possible at mixing site In proportioning concrete the quantity of both cement and aggregate shall be determined by weight water shall either be measured by volume in calibrated tank or weighted. All measuring equipment shall be maintained in clean and serviceable condition.

It is most important to keep the specified water cement ratio constant. To this end, moisture content in both fine and coarse aggregates shall be determined by the Engineer-in-charge. The amount of mixing water shall then be adjusted to compensate for any variations needed in the moisture content. For the determination of moisture content in the aggregate IS 2386-1977 (Part-III) shall be referred to Suitable adjustments shall also be made in the weight of aggregate to allow for variations in weight of aggregates due to variations in their moisture content.

The cement level for various grades of controlled concrete shall be considered as under for working out the rates to be quoted in Schedule-B.

Sr. No.	Grade of concrete	Cement level required in Kg per cubic meter of concrete (As per standard Mix design 30-7-2018 Circular)
1	C.C. 1:2:4	300

The cement level shown above Table is tentative. Actual cement level required for the aggregate to be used shall be determined by mix design and laboratory test. As per design mix, if it becomes obligatory to use more cement per cubic meter of concrete, the contractor shall execute the same without claiming any extra cost for handling of extra cement. In case of actual use being less than the cement level specified in the above table, the Govt. shall deduct the cost of cement from the bill at Input rate per M.T.

(As per NWRWs & K Dept. letter no. MIS102010/17/K-1/ Dt. 30-07-2018)

Actual cement level required for the aggregate to be used shall have to be determined by laboratory tests. The mix proportions shall be selected to ensure that the workability of the fresh concrete is suitable for the conditions of handling and placing so that after compaction it surrounds all reinforcements and completely fills the formwork. When concrete is hardened, it shall have the required strength, durability and surface finish.

A mix shall be designed to produce the grade of concrete having the required workability and characteristic strength not less than that stipulated in tender specification. However, due to change in design mix, if it becomes obligatory to use less or more cement per cubic meter of concrete, the Contractor shall do the same without claiming any extra cost for handling of extra cement. However due to change in design mix it is obligatory to use less/more cement per cubic meter of concrete, contractor shall do same without claiming extra cost for using cement. In case actual cement use being less then cement level specified in table here in above, the department will deduct the cost of cement from the

bill at the base price of star rate and rate analysis per tonne of cement at work site for reduce consumption of cement. In case actual use of cement being more than specified above no extra payment for additional cement level shall be made and contractor shall have to bear addition cost. In no case, cement level shall be less than the provisions mentioned in the above table.

The quantity of water shall be just sufficient to produce a dense concrete of required workability and strength for the job. An accurate and strict control shall be kept on the quantity of water.

In the case of reinforced concrete work, workability shall be such that the concrete surrounds and properly grips all reinforcement. The degree of consistency, which shall depend upon the nature of work and methods of vibration of concrete, shall be determined by regular slump tests both at batching plant site and work site.

Slumps as per IS 456 shall be adopted.

Material Feeding and Elevating Arrangements

~~Suitable arrangements may be provided for elevating cement and aggregates to the respective compartment bins of the batching plant. This may be by means of bucket elevator or by pumping of cement from the storage silos, and belt conveyor system for the aggregates, or any other equally efficient arrangement. When these arrangements are to be made by the customer, it should be stated in the enquiry or order.~~

Batching

The proportion of cement, sand and coarse aggregate shall be determined of weight. The weight batch machine shall be used for maintaining proper control over the proportion of aggregates as per mix design.

- **Mixing**
- The kind of cement such as Ordinary Portland Cement shall be used in the work requirement and as decided by Engineer-In-Charge. In order to prepare the concrete mix with the specified cement, such arrangement shall be made in the weigh batcher at site of the work.
- The concrete ingredients shall be mixed thoroughly in batch mixers of satisfactory type and size, which are so designed as to ensure uniform distribution of all the constituent materials throughout the mass at the end of the mixing period. The weigh batcher shall be so designed and operated that all materials entering the mixer can be accurately proportioned and readily controlled. The entire batch within the mixer shall be discharged before recharging. The volume of mixed materials per batch shall not exceed the rated capacity. A mixer will be considered unsatisfactory, if from three tests of any one batch, a change in slump exceeding 25 mm or change in air content exceeding one percent is noticed between representative samples taken at different portions of the mixer discharge.
- The first concrete batch at the start of continuous mixing operation or after a lapse of 30 minutes in continuous mixing operation shall be made richer by the addition of extra cement as directed. No extra payment shall be done for the extra cement to be used in starting mix of concrete.
- For any one batch, the difference between the unit weight of coarse aggregate from concrete samples from the front and end of the mixer discharge, when determined in accordance with the above mentioned mixer performance test shall not exceed 10 percent of the mean value.
- The mixing of each batch shall continue, for not less than the period stated in Table – I of I.S. 457 – 1957 as shown below, unless tests of mixer performance show that variation in the prescribed time is necessary or acceptable. Each mixer shall have a timing device for indicating the completion of the required mixing period.
- The mixer shall have 15 to 20 revolutions per minute.

Capacity of Mixer	Minimum time of mixing	
	Material Aggregate	Manufactured aggregates
3 m ³ or larger	2 minutes	2.5minutes

2 m ³	1.5 minutes	2.0 minutes
1 m ³ or smaller	1.25 minutes	1.5 minutes

- The actual time of mixing shall be checked at least twice during each shift and the timing device shall be adjusted if there is error. The timing device shall be so interlocked with the discharge gate of the batch hopper that the timing does not start until the discharge gate is fully closed and all ingredients are in the drum. A suitable record shall be kept of the average time consumed in charging, mixing and discharging a batch during each run.
- The full contents of the drum shall be discharged quickly to avoid segregation.
- The minimum mixing periods specified are considered on the materials being fed into the mixer in a manner which will facilitate efficient mixing and an operation of the mixer at its designed speed. The following sequence of charging the mixer may be adopted.
- Five to ten percent of the total quantity of water required for mixing, adequate to wet the drum thoroughly, shall be introduced before the other ingredients in order to prevent any caulking of the cement on the blades or sides of the mixer.
- All dry ingredients (cement and fine and coarse aggregates) shall be simultaneously fed into the mixer in such a manner that the period of flow for each ingredient is about the same. Eighty to ninety percent of the total quantity of water required for mixing shall be added uniformly along with the dry ingredients.
- The remaining quantity of water shall be added after all the other ingredients are in the mixer.
- Portion of the coarse aggregates, however, may be added last. This facilitates clearance of the chutes and removes any fine aggregate or cement adhering to the sides.
- Excessive mixing, requiring additions of water to preserve the required concrete consistency shall not be permitted. Concrete which has been kept unused for more than 30 minutes after the addition of water shall be rejected unless the concrete is in such a condition that it can be subsequently vibrated in place and its use is specifically permitted.
- When the mixer is stopped, before placing again any ingredients in the mixer, all hardened concrete or mortar shall be removed from the inner surface of the mixer.
- The re-tempering of partially hardened concrete or mortar requiring renewed mixing with or without the addition of cement, aggregate or water shall not be permitted.

Consistency

The quantity of water to be used in the concrete shall be determined from time to time during the course of concreting work in order to secure concrete of proper consistency and also adjust for any variation in the moisture content or grading of the aggregates as they enter the mixer.

Addition of water to compensate the stiffening of the concrete resulting from over mixing or objectionable drying before placing shall not be permitted. Uniformity in concrete consistency from batch to batch shall be ensured by taking slump test. Concrete shall be laid from the bottom to the top of the slope, for which consistency shall be such that the concrete will just stay in place on the slope. Slump shall be maintained as per IS 456 or as directed.

Concrete shall be handled from the place of mixing to the place of final depositing as rapidly as practicable by use of equipment such as transit mixer which will prevent initial setting, segregation or loss of any of the ingredients. It shall be transported and compacted in its final position within 30 minutes of its discharge from the mixture.

If segregation occurs during transport, the concrete shall be remixed before being placed, after observing the time requirements as above.

Temperature of concrete and weather conditions

The temperature of concrete at the time of placement, temperature not less than 6°C not more 32° C .Concreting operation shall be temporarily suspended during excessively hot weather when the air temperature exceeds 45° C when conditions are such that the concrete cannot be placed at the required

temperature. Wherever necessary, exposed surfaces or fresh concrete shall be adequately shaded from the direct rays of the sun and protected against premature setting or drying by curing under continuous fine spray of water.

Transporting Concrete

Concrete shall be transported from the place of mixing to the final position without any segregation or loss of ingredients or slump loss in excess of 25 mm and/or a loss in air content of more than one percent before the concrete is placed in the works. Conveying concrete by head load shall not be permitted in any case.

If buckets are used for conveying low slump concrete they shall be capable of promoting discharge in controlled quantities without splashing or segregating and shall be of such capacity that there is no splitting of batches in loading buckets. Buckets shall be of the bottom dump type permitting an even and controlled flow into the forms or hopper without undue splashing or segregation. Conveying vehicles shall be designed to facilitate delivery rather than quick dumping.

Chutes used for conveying concrete shall be of such size and shapes as to ensure a steady uniform flow of concrete in a compact mass without separation or loss of ingredients and shall be protected from wind and sun where necessary to prevent loss of slump by evaporation and shall be furnished with a discharge hopper. Free fall or drop of concrete shall be limited to 150 cm. Chute section shall be made of or lined with metal and all runs shall have approximately the same slopes not flatter than 1 vertical to 2.5 horizontal. The required consistency of concrete shall not be changed in order to facilitate chuting. Where it becomes necessary to change toe consistency, the mix shall be completely redesigned. Wherever there is a free fall within the conveying system, suitable baffle plates, splash boards or down spouts shall be provided to prevent segregation, splashing or loss of ingredients. Wherever it is necessary to hold the discharge end of a chute more than 3 meter above the level of the fresh concrete, a flexible down spout shall be used to break the fall and confine the flow. The lower end of the spout shall be held closed to the place of deposit. Wherever depositing is intermittent, a discharge hopper shall be provided. All chutes shall be thoroughly cleaned before and after each run. All wash water and debris shall be disposed off outside the forms. Use of chutes shall be allowed in exceptional circumstances and adverse placement condition only.

Alternatively properly designed Belt-creates capable to cover of one monolith shall be allowed to be used for conveying concrete for placement in the structures. Belt-creates shall ensure an adequate and steady uniform flow of concrete in a compact mass without any segregation and shall have a discharge hopper with a flexible down spout as to ensure concrete placement as close to the place of deposit as possible and in no case more than about a meter.

Equipment used for transporting concrete from the mixer to the forms shall be maintained free from deposits of stiff concrete and leakage of mortar.

Form Work

SHUTTERING

Timber/Wooden planking: The shuttering shall be either of wooden planking of 30 mm. minimum thickness with or without steel lining or steel plates stiffened by steel angles. The shuttering shall be supported on battens and beams and props of vertical ballies properly cross-braced together, so as to make the centering rigid. In place of ballie props, brick pillar or adequate section built in mud mortar may be used.

The formwork shall be sufficiently strong and shall have camber, so that it assumes correct shape after deposition of the concrete and shall be able to resist forces caused by vibration, live load of men working over it and other incident, loads associated with it. The shuttering shall have smooth and even surface and its joints shall not permit leakage of cement grout.

If at any stage of work, during or after placing concrete in the structure, the formwork sags or bulges out beyond the required shape of the structure, the concrete shall be removed and work redone with fresh concrete and adequately rigid form work. The complete formwork shall be got inspected by and got

approved from the Engineer-in-charge, before the reinforcement bars are placed in position.

The props shall consist of ballies having 100 mm. minimum diameter measured at mid length and 80 mm. at thin end and shall be placed as per design requirement. These shall rest squarely on wooden sole plate 40 mm. thick and minimum bearing area of 0.10 m² laid on sufficiently hard base.

Double wedges shall further be provided between the sole plate and the wooden props so as to facilitate tightening and easing of shuttering without jerking the concrete.

The timber used in shuttering shall not be so dry as to absorb water from concrete and swell or bulge nor so green or wet as to shrink after erection. The timber shall be properly sawn and planned on the sides and surface coming in contact with concrete. Wooden formwork with metal sheet lining or steel plates stiffened by steel angles shall be permitted.

As far as possible, clamps shall be used to hold the forms together and use of nails and spikes shall be avoided.

The surface of timber shuttering that would come in contact with concrete shall be well wetted and coated with soap solution before the concreting is done. Alternatively coat of raw linseed oil or oil of approved manufacture may be applied in place of soap solution. In case of steel shuttering, either soap solution or raw linseed oil shall be applied after thoroughly cleaning the surface. Under no circumstances, black or burnt oil shall be permitted.

The shuttering for beams and slabs shall have camber of 4 mm per meter (1 in 250) or as directed by Engineer-in-charge, so as to offset the subsequent deflection. For cantilevers, the camber at free end shall be 1/50 of the project length or as directed by the Engineer-in-charge and Architect.

Concrete Shuttering Ply wood :

It shall be made from strong and selected hard-woods. It shall be bonded with high quality Phenol Formaldehyde synthetic resin adhesive, hot pressed and then shall be further treated with a permanent type of preservative by vacuum-cum-pressure impregnation.

Due to the bonding with Phenol Formaldehyde, it shall be moisture and weather proof. The uses of selected hardwoods render hard and wear-resistant faces and thereby it shall be reusable several times. It shall be highly resistant to rot, termites and other wood inhabiting insects. Due to complete penetration of the preservative, it shall be exceedingly durable.

It shall have high impact strength and therefore shall be used successfully in place of timber planks and steel sheets. It shall protect the concrete from rapid temperature changes and shall provide optimum conditions for setting of the concrete. As it shall possess remarkable design flexibility, it shall be ideal for curved formwork.

Besides it shall be used as centering, shuttering and formwork of concrete columns, beams, slabs, walls, tanks, bridges, fly-over, silos etc. It shall also be used for structural applications like external walling, roofing, flooring, curtain walls, work-site offices, in cabins of trucks, rail coaches etc.

Steel Sheeting and Steel Plates:

Steel sheeting and steel plates should be free from clinks, twists, offsets, warps etc. Their surface should be neat, clean and smooth. Before placing concrete, steel, forms shall be thoroughly cleaned off from all rust, dust and loose materials. Colour less oil or grease of approved quality shall be applied before placing steel.

The size of angles used for framing and bracing of steel plates should be sufficient to withstand the weight of concrete without forming clinks, twists, offsets, warps, etc. in the steel plates. Also, the gauge of steel sheeting used should not be higher than 18G.

Minimum two bracing angles should be provided along with angle framing while making the steel plates. It should be reverted or welded to suit the requirement of finish concrete surface. Minimum two rivets should be provided at all four corners and at junction of angle framing and bracing.

If the plates are to be welded, steel sheet and angle framing/bracing should be welded from sides and at back. Welding on sides should be buffed to make the sides smooth. Also, intermittent welding should be done to keep steel sheet and angle framing/bracing in one plane.

Expanded Metal Sheets:

The expanded metal sheets shall be free from flaws, joints, broken strands, laminations and other harmful surface defects. Expanded metal steel sheet shall conform to IS 412 except that blank sheets

need not be with guaranteed mechanical properties. The size of the diamond mesh of expanded metal and dimensions of strands (width and thickness) shall be as specified. The tolerance on nominal weight of expanded metal sheets shall be of $\pm 10\%$.

Expanded metal in panels shall be in one whole piece, in each panel, as far as stock sizes permit. The expanded metal sheets shall be coated with suitable protective coating to prevent corrosion.

Centering:

The centering to be provided shall be got approved. It shall be sufficiently strong to ensure absolute safety of the formwork and concrete work before, during and after pouring concrete. Watch should be kept to see that behavior of centering and formwork is satisfactory during concreting. Erection should also be such that it would allow removal of forms in proper sequence without damaging either the concrete or the forms to be removed.

The props of centering shall be provided on firm foundation or base of sufficient strength to carry the loads, without any settlement.

The centering and formwork shall be inspected and approved by the Engineer-in-charge, before concreting. But this will not relieve the Contractor of his responsibility for strength; adequacy and safety of formwork and centering. If there is a failure of formwork or centering, the Contractor shall be responsible for the damages to the work, injury to life and damage to property.

Cleaning & Treatment of Forms:

All rubbish, particularly Dead Mortar, dust etc. shall be removed from the interior of the form before the concrete is placed and the form work in contact with concrete shall be cleaned and thoroughly wetter or treated. The surface shall be coated with soap solution, applied before concreting is done. Soap solution for the oil or from oil of approved manufacture may be applied, incase steel shuttering is used. Care shall be taken that the coating is not applied on the construction joints surface and steel reinforcement bars.

Re-use of Forms:

Before re-use, all forms shall be inspected by the Engineer-in-charge and their suitability shall be ascertained. If, any of the forms are found to be unsuitable, they shall be immediately removed from the site. The forms ascertained for re-use, shall be scarred, cleaned, and joints gone over and repaired, wherever required. The inside surface shall be retreated to prevent adhesion to concrete.

Procedure while removing the form work:

All formwork shall be removed without such shocks or vibrations as would damage the reinforced concrete surface. Before the soffit formwork and struts are removed, the soffits and the concrete surface shall be exposed where necessary in order to ascertain that the concrete has sufficiently hardened.

Mild Steel Wire (Wire Gauze Jali):

Mild steel wire may be galvanized, as indicated. All finished steel wire shall be well sawn to the dimensions, and the size of the wire shall be as specified in item. The wire shall be sound, free from splits, surface flaw, rough, jagged and imperfect edges and other harmful surface defects and shall conform to I.S. 280-1978.

Preparation for Placing concrete

Concrete shall be placed only in the presence of a duly authorized representative of the Engineer-in-Charge. Concrete shall be placed and compacted before initial setting time ends and shall not be subsequently disturbed.

Placing of concrete shall not be started until sub grade/surface is ready and preparation of surface upon which concrete is to be laid, have been completely inspected and approved by Engineer-in-Charge. All absorptive surfaces against which concrete is to be laid shall be moistened adequately so that moisture is not be withdrawn from freshly placed concrete. The surfaces, however, shall be free from any water and slush.

Concrete shall be deposited in all cases as neatly as practicable directly in its final position and shall not be caused to flow in a manner to permit segregation. Excessive separation of the coarse aggregate caused by allowing the concrete to fall freely from too great a height or at too great an angle from the vertical shall not be permitted.

Placing and Compaction

Concrete shall be placed only in presence of a duly authorized representative of the Government. Concrete shall be placed and compacted before initial setting time and shall not be subsequently distributed.

Placing of concrete shall not be started until base is ready and preparation of surface upon which concrete is to be laid, have been completely inspected and approved by Engineer-in-charge. All absorptive surfaces against which concrete is to be laid shall be moistened adequately so that moisture shall not be withdrawn from freshly placed concrete. The surface, however, shall be free from any water and slush.

Concrete shall be deposited in all cases as nearly as practicable directly in its final position and shall not be caused to flow in a manner to permit segregation. Excessive separation of the coarse aggregate caused by allowing the concrete to fall freely from too great a height or at too great an angle from the vertical shall not be permitted and where such separation would otherwise the contractor shall provide suitable means i.e. belt conveyor to convey the concrete without allowing such separation. Concrete may require to be placed by concrete pump as per site condition and as per direction of Engineer-in-charge. Compaction shall be done by vibrator in accordance with directions laid down I.S. 456

Finishing

All exposed concrete surfaces shall be cleaned of impurities, lumps of mortar or grout and unsightly stains. The finished surface shall be even, smooth and free from pockets and equivalent to that obtainable by effective use of a long handle steel trowel. Where the surface produced by lining machines meet the specified requirements, no further finishing operation will be required.

The surface of concrete finished shall be smooth and free from projections, honeycombing and other objectionable defects.

Repairs to concrete surface and additions where required shall be made by cutting regular opening into the concrete and placing fresh concrete to the required lines. Chipped opening shall be sharp and shall not be less than 75 mm in depth.

Dewatering

Necessary dewatering during process of concreting shall be done at no extra cost. Dewatering due to water entering due to any reason shall be resorted to and continued during preparation of sub grades, providing under drainage arrangements and placing of concrete till such period the concrete attains necessary strength. No separate payment shall be made for dewatering for presence of water due to any reason, as the same is deemed to have been included in rates.

Water Curing

Uniform top surface of concrete shall be kept continuously moist by covering it completely with wet burlap coarse canvas of jute as soon as the concrete has hardened sufficiently say, 4 to 6 hours after concrete placement. The burlap shall be kept continuously wet by spraying water for at least 12 hours. Thereafter curing by ponding shall be resorted to. Concrete cured with water shall be kept wet by ponding for at least 14 days. The suitable elevated tank shall be provided for continuous flow of water for the above purpose. Water lost by evaporation shall be replenished periodically to keep the surfaces continuously (not periodically) submerged under water.

Testing of Concrete and Acceptance of Work

Testing of concrete shall be carried out in accordance with relevant Indian Standards. The compressive strength requirements for the various mixes of concrete are as per Para "Strength requirements of Concrete"

Sampling Procedure

Sampling procedure: A random sampling procedure shall be adopted to ensure that each concrete batch has a reasonable chance of being tested i.e. the sampling shall be spread over the entire period of

concreting and shall cover all mixing units.

Frequency

The minimum frequency of sampling of concrete of each grade shall be in accordance with following.

Quantity of Concrete m ³	Number of Samples
1 to 5	1
6 to 15	2
16 to 30	3
31 to 50	4
51 and Above	4 plus one additional sample For each addi. 50 Cum or part there of

Additional samples may be required for various purposes such as to determine the strength of concrete at 7 days. The test results of the sample shall be the average of the strength of three specimens. The individual variation should not be more then +/- 15 % of the average. If more, the test results of the sample are invalid.

Test Specimen

Three test specimens shall be made from each sample for testing at 28 days Additional cubes may be required for various purposes, such as to determine the strength of concrete at 7 days or at the time of striking formwork, or to determine the duration of curing or to check the testing cubes cured by accelerated methods as described in IS 9013. The specimen shall be tested as directed in IS 516.

Use of Ready Mix Concrete:

Use of RMC is permitted only in the case of emergency conditions. In such case, the mix design of the RMC supplier shall be submitted for approval. The other provisions viz. grade of concrete, cement level, use of more or less cement, recovery for cement etc. shall be as per Para-5 – Controlled Concrete.

In the case of use of RMC, computerized delivery tickets with details of time of production of concrete, grade of concrete, quantity of concrete, detailed batch report showing consumption of various ingredients etc. shall be submitted to the department. Excise and Tax paid Bills of RMC shall also be submitted. No extra charges for lead, use of RMC etc. shall be paid separately.

Mode of Measurement and Payment

The concrete work shall be measured in length, breadth and depth as specified on drawing or as directed, correct up to nearest centimeters and cubical content shall be worked out nearest centimeter and cubical content shall be worked out nearest up to two places or decimals.

The unit rate also includes costs of all material, transport with all lead and lifts, mixing, formwork, conveying, placing, pumping, pouring, making joints, vibrating, compacting, smooth finishing, curing, forming etc.

The payment will be made on cubic meter of the completed work with all lifts and lead.

The unit rate quoted by the bidder for the respective item shall be deemed to have been included the requirement of cement for miscellaneous operations like priming of mixer, laying cement slurry for successive lifts, finishing of concrete etc. also.

The rate shall be inclusive of chemical admixture like plasticizer etc. No additional payment shall be paid on this account.

The rate of item is inclusive of cost of concrete, from plant to site, octroi, transportation, all other taxes, etc. complete.

The payment shall be made on Cubic Meter basis.

Deputy Executive Engineer
Ahmedabad. Irrigation Sub Division
Ahmedabad.

Executive Engineer
Ahmedabad Irrigation Division
Ahmedabad.

ITEM NO.4:

Providing and laying C.C. 1:2:4 grade using cement,sand and crushed metal including providing and erecting necessary form work, centering , vibrating, smooth finishing,watering and curing as directed with all leads and lifts etc.complete .

(a)Super structures (MSA20)

Material

Material Specification for Water (M-1), Sand (M-2), Cement (M-3), Grit (M-4), Coarse Aggregate (M-5) shall conform.

Strength Requirement of Concrete

The compressive strength requirements for the various mixes by concrete shall be as follows.

Type of concrete of 150 mm cubes	Minimum compressive strength in N/mm ²	
	7 Days	28 days
C.C. 1:2:4	10.0 N/mm ²	15.0 N/mm ²

Size of Metal

Unless otherwise specified by the Engineer-in-charge the maximum size of metal for different type of concrete shall not exceed the limits given below. However in case of reinforced cement concrete the maximum limits shall be restricted to 6 mm less than the minimum lateral clear distance between bars or 6mm less than the cover whichever is smaller.

Class of work	Nominal size of metal
1. R.C.C. work	20 mm
2. Ordinary plain concrete	40 mm / 20 MSA
3. Foundation concrete	40 mm
4. Mass concrete	40 mm

Grading of Metal

The metal shall be well graded. Their grading of the above sizes shall be within the limits as given in table below:

I.S.SIEVE DESIGNATION	PERCENTAGE PASSING FOR SINGLE SIZED AGGREGATE OF NORMAL SIZE	
	40 mm	20 mm
63 mm	100	-
40 mm	85 - 100	100
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10.0 mm	0 - 5	0 - 20
4.75 mm	-	0 - 5
2.35 mm	-	-
2.35 mm	-	-

Percentage mentioned above may be varied somewhat by the Engineer-in-Charge when considered necessary for obtaining better density and strength of concrete.

Controlled Concrete

Concrete mix shall be designed on the basis of preliminary tests. The proportion of ingredients shall be such that concrete has adequate workability for conditions prevailing on the work in question and can be properly compacted with the means available.

Except, it can be shown to the satisfaction of the Engineer-in-charge that supply of properly graded

aggregate of uniform quality can be maintained till the completion of work. grading of aggregate shall be controlled by obtaining the coarse aggregate in different sizes and blending them in the right proportions as required different sizes however shall be stacked in separate stock piles Required quantity of material shall be stock piled several hours preferably a day before use. Grading of coarse and fine aggregates shall be checked as frequently as possible at mixing site In proportioning concrete the quantity of both cement and aggregate shall be determined by weight water shall either be measured by volume in calibrated tank or weighted. All measuring equipment shall be maintained in clean and serviceable condition.

It is most important to keep the specified water cement ratio constant. To this end, moisture content in both fine and coarse aggregates shall be determined by the Engineer-in-charge. The amount of mixing water shall then be adjusted to compensate for any variations needed in the moisture content. For the determination of moisture content in the aggregate IS 2386-1977 (Part-III) shall be referred to Suitable adjustments shall also be made in the weight of aggregate to allow for variations in weight of aggregates due to variations in their moisture content.

The cement level for various grades of controlled concrete shall be considered as under for working out the rates to be quoted in Schedule-B.

Sr. No.	Grade of concrete	Cement level required in Kg per cubic meter of concrete (As per standard Mix design 30-7-2018 Circular)
1	C.C. 1:2:4 (MSA 20mm)	300

The cement level shown above Table is tentative. Actual cement level required for the aggregate to be used shall be determined by mix design and laboratory test. As per design mix, if it becomes obligatory to use more cement per cubic meter of concrete, the contractor shall execute the same without claiming any extra cost for handling of extra cement. In case of actual use being less than the cement level specified in the above table, the Govt. shall deduct the cost of cement from the bill at Input rate per M.T.

(As per NWRWs & K Dept. letter no. MIS102010/17/K-1/ Dt. 30-07-2018)

Actual cement level required for the aggregate to be used shall have to be determined by laboratory tests. The mix proportions shall be selected to ensure that the workability of the fresh concrete is suitable for the conditions of handling and placing so that after compaction it surrounds all reinforcements and completely fills the formwork. When concrete is hardened, it shall have the required strength, durability and surface finish.

A mix shall be designed to produce the grade of concrete having the required workability and characteristic strength not less than that stipulated in tender specification. However, due to change in design mix, if it becomes obligatory to use less or more cement per cubic meter of concrete, the Contractor shall do the same without claiming any extra cost for handling of extra cement. However due to change in design mix it is obligatory to use less/more cement per cubic meter of concrete, contractor shall do same without claiming extra cost for using cement. In case actual cement use being less then cement level specified in table here in above, the department will deduct the cost of cement from the bill at the base price of star rate and rate analysis per tonne of cement at work site for reduce consumption of cement. In case actual use of cement being more than specified above no extra payment for additional cement level shall be made and contractor shall have to bear addition cost. In no case, cement level shall be less than the provisions mentioned in the above table.

The quantity of water shall be just sufficient to produce a dense concrete of required workability and strength for the job. An accurate and strict control shall be kept on the quantity of water.

In the case of reinforced concrete work, workability shall be such that the concrete surrounds and properly grips all reinforcement. The degree of consistency, which shall depend upon the nature of work and methods of vibration of concrete, shall be determined by regular slump tests both at batching plant site and work site.

Slumps as per IS 456 shall be adopted.

Material Feeding and Elevating Arrangements

~~Suitable arrangements may be provided for elevating cement and aggregates to the respective~~

~~compartment bins of the batching plant. This may be by means of bucket elevator or by pumping of cement from the storage silos, and belt conveyor system for the aggregates, or any other equally efficient arrangement. When these arrangements are to be made by the customer, it should be stated in the enquiry or order.~~

Batching

The proportion of cement, sand and coarse aggregate shall be determined of weight. The weight batch machine shall be used for maintaining proper control over the proportion of aggregates as per mix design.

- **Mixing**

- The kind of cement such as Ordinary Portland Cement shall be used in the work requirement and as decided by Engineer-In-Charge. In order to prepare the concrete mix with the specified cement, such arrangement shall be made in the weigh batcher at site of the work.
- The concrete ingredients shall be mixed thoroughly in batch mixers of satisfactory type and size, which are so designed as to ensure uniform distribution of all the constituent materials throughout the mass at the end of the mixing period. The weigh batcher shall be so designed and operated that all materials entering the mixer can be accurately proportioned and readily controlled. The entire batch within the mixer shall be discharged before recharging. The volume of mixed materials per batch shall not exceed the rated capacity. A mixer will be considered unsatisfactory, if from three tests of any one batch, a change in slump exceeding 25 mm or change in air content exceeding one percent is noticed between representative samples taken at different portions of the mixer discharge.
- The first concrete batch at the start of continuous mixing operation or after a lapse of 30 minutes in continuous mixing operation shall be made richer by the addition of extra cement as directed. No extra payment shall be done for the extra cement to be used in starting mix of concrete.
- For any one batch, the difference between the unit weight of coarse aggregate from concrete samples from the front and end of the mixer discharge, when determined in accordance with the above mentioned mixer performance test shall not exceed 10 percent of the mean value.
- The mixing of each batch shall continue, for not less than the period stated in Table – I of I.S. 457 – 1957 as shown below, unless tests of mixer performance show that variation in the prescribed time is necessary or acceptable. Each mixer shall have a timing device for indicating the completion of the required mixing period.
- The mixer shall have 15 to 20 revolutions per minute.

Capacity of Mixer	Minimum time of mixing	
	Material Aggregate	Manufactured aggregates
3 m ³ or larger	2 minutes	2.5minutes
2 m ³	1.5 minutes	2.0 minutes
1 m ³ or smaller	1.25 minutes	1.5 minutes

- The actual time of mixing shall be checked at least twice during each shift and the timing device shall be adjusted if there is error. The timing device shall be so interlocked with the discharge gate of the batch hopper that the timing does not start until the discharge gate is fully closed and all ingredients are in the drum. A suitable record shall be kept of the average time consumed in charging, mixing and discharging a batch during each run.
- The full contents of the drum shall be discharged quickly to avoid segregation.
- The minimum mixing periods specified are considered on the materials being fed into the mixer in a manner which will facilitate efficient mixing and an operation of the mixer at its designed speed. The following sequence of charging the mixer may be adopted.

- Five to ten percent of the total quantity of water required for mixing, adequate to wet the drum thoroughly, shall be introduced before the other ingredients in order to prevent any caulking of the cement on the blades or sides of the mixer.
- All dry ingredients (cement and fine and coarse aggregates) shall be simultaneously fed into the mixer in such a manner that the period of flow for each ingredient is about the same. Eighty to ninety percent of the total quantity of water required for mixing shall be added uniformly along with the dry ingredients.
- The remaining quantity of water shall be added after all the other ingredients are in the mixer.
- Portion of the coarse aggregates, however, may be added last. This facilitates clearance of the chutes and removes any fine aggregate or cement adhering to the sides.
- Excessive mixing, requiring additions of water to preserve the required concrete consistency shall not be permitted. Concrete which has been kept unused for more than 30 minutes after the addition of water shall be rejected unless the concrete is in such a condition that it can be subsequently vibrated in place and its use is specifically permitted.
- When the mixer is stopped, before placing again any ingredients in the mixer, all hardened concrete or mortar shall be removed from the inner surface of the mixer.
- The re-tempering of partially hardened concrete or mortar requiring renewed mixing with or without the addition of cement, aggregate or water shall not be permitted.

Consistency

The quantity of water to be used in the concrete shall be determined from time to time during the course of concreting work in order to secure concrete of proper consistency and also adjust for any variation in the moisture content or grading of the aggregates as they enter the mixer.

Addition of water to compensate the stiffening of the concrete resulting from over mixing or objectionable drying before placing shall not be permitted. Uniformity in concrete consistency from batch to batch shall be ensured by taking slump test. Concrete shall be laid from the bottom to the top of the slope, for which consistency shall be such that the concrete will just stay in place on the slope. Slump shall be maintained as per IS 456 or as directed.

Concrete shall be handled from the place of mixing to the place of final depositing as rapidly as practicable by use of equipment such as transit mixer which will prevent initial setting, segregation or loss of any of the ingredients. It shall be transported and compacted in its final position within 30 minutes of its discharge from the mixture.

If segregation occurs during transport, the concrete shall be remixed before being placed, after observing the time requirements as above.

Temperature of concrete and weather conditions

The temperature of concrete at the time of placement, temperature not less than 6°C not more 32° C .Concreting operation shall be temporarily suspended during excessively hot weather when the air temperature exceeds 45° C when conditions are such that the concrete cannot be placed at the required temperature. Wherever necessary, exposed surfaces or fresh concrete shall be adequately shaded from the direct rays of the sun and protected against premature setting or drying by curing under continuous fine spray of water.

Transporting Concrete

Concrete shall be transported from the place of mixing to the final position without any segregation or loss of ingredients or slump loss in excess of 25 mm and/or a loss in air content of more than one percent before the concrete is placed in the works. Conveying concrete by head load shall not be permitted in any case.

If buckets are used for conveying low slump concrete they shall be capable of promoting discharge in controlled quantities without splashing or segregating and shall be of such capacity that there is no splitting of batches in loading buckets. Buckets shall be of the bottom dump type permitting an even and controlled flow into the forms or hopper without undue splashing or segregation. Conveying vehicles

shall be designed to facilitate delivery rather than quick dumping.

Chutes used for conveying concrete shall be of such size and shapes as to ensure a steady uniform flow of concrete in a compact mass without separation or loss of ingredients and shall be protected from wind and sun where necessary to prevent loss of slump by evaporation and shall be furnished with a discharge hopper. Free fall or drop of concrete shall be limited to 150 cm. Chute section shall be made of or lined with metal and all runs shall have approximately the same slopes not flatter than 1 vertical to 2.5 horizontal. The required consistency of concrete shall not be changed in order to facilitate chuting. Where it becomes necessary to change toe consistency, the mix shall be completely redesigned. Wherever there is a free fall within the conveying system, suitable baffle plates, splash boards or down spouts shall be provided to prevent segregation, splashing or loss of ingredients. Wherever it is necessary to hold the discharge end of a chute more than 3 meter above the level of the fresh concrete, a flexible down spout shall be used to break the fall and confine the flow. The lower end of the spout shall be held closed to the place of deposit. Wherever depositing is intermittent, a discharge hopper shall be provided. All chutes shall be thoroughly cleaned before and after each run. All wash water and debris shall be disposed off outside the forms. Use of chutes shall be allowed in exceptional circumstances and adverse placement condition only.

Alternatively properly designed Belt-creates capable to cover of one monolith shall be allowed to be used for conveying concrete for placement in the structures. Belt-creates shall ensure an adequate and steady uniform flow of concrete in a compact mass without any segregation and shall have a discharge hopper with a flexible down spout as to ensure concrete placement as close to the place of deposit as possible and in no case more than about a meter.

Equipment used for transporting concrete from the mixer to the forms shall be maintained free from deposits of stiff concrete and leakage of mortar.

Form Work

SHUTTERING

Timber/Wooden planking: The shuttering shall be either of wooden planking of 30 mm. minimum thickness with or without steel lining or steel plates stiffened by steel angles. The shuttering shall be supported on battens and beams and props of vertical ballies properly cross-braced together, so as to make the centering rigid. In place of ballie props, brick pillar or adequate section built in mud mortar may be used.

The formwork shall be sufficiently strong and shall have camber, so that it assumes correct shape after deposition of the concrete and shall be able to resist forces caused by vibration, live load of men working over it and other incident, loads associated with it. The shuttering shall have smooth and even surface and its joints shall not permit leakage of cement grout.

If at any stage of work, during or after placing concrete in the structure, the formwork sags or bulges out beyond the required shape of the structure, the concrete shall be removed and work redone with fresh concrete and adequately rigid form work. The complete formwork shall be got inspected by and got approved from the Engineer-in-charge, before the reinforcement bars are placed in position.

The props shall consist of ballies having 100 mm. minimum diameter measured at mid length and 80 mm. at thin end and shall be placed as per design requirement. These shall rest squarely on wooden sole plate 40 mm. thick and minimum bearing area of 0.10 m² laid on sufficiently hard base.

Double wedges shall further be provided between the sole plate and the wooden props so as to facilitate tightening and easing of shuttering without jerking the concrete.

The timber used in shuttering shall not be so dry as to absorb water from concrete and swell or bulge nor so green or wet as to shrink after erection. The timber shall be properly sawn and planned on the sides and surface coming in contact with concrete. Wooden formwork with metal sheet lining or steel plates stiffened by steel angles shall be permitted.

As far as possible, clamps shall be used to hold the forms together and use of nails and spikes shall be avoided.

The surface of timber shuttering that would come on contact with concrete shall be well wetted and coated with soap solution before the concreting is done. Alternatively coat of raw linseed oil or oil of approved manufacture may be applied in place of soap solution. In case of steel shuttering, either soap solution or raw linseed oil shall be applied after thoroughly cleaning the surface. Under no circumstances, black or burnt oil shall be permitted.

The shuttering for beams and slabs shall have camber of 4 mm per meter (1 in 250) or as directed by Engineer-in-charge, so as to offset the subsequent deflection. For cantilevers, the camber at free end shall be 1/50 of the project length or as directed by the Engineer-in-charge and Architect.

Concrete Shuttering Ply wood :

It shall be made from strong and selected hard-woods. It shall be bonded with high quality Phenol Formaldehyde synthetic resin adhesive, hot pressed and then shall be further treated with a permanent type of preservative by vacuum-cum-pressure impregnation.

Due to the bonding with Phenol Formaldehyde, it shall be moisture and weather proof. The uses of selected hardwoods render hard and wear-resistant faces and thereby it shall be reusable several times. It shall be highly resistant to rot, termites and other wood inhabiting insects. Due to complete penetration of the preservative, it shall be exceedingly durable.

It shall have high impact strength and therefore shall be used successfully in place of timber planks and steel sheets. It shall protect the concrete from rapid temperature changes and shall provide optimum conditions for setting of the concrete. As it shall possess remarkable design flexibility, it shall be ideal for curved formwork.

Besides it shall be used as centering, shuttering and formwork of concrete columns, beams, slabs, walls, tanks, bridges, fly-over, silos etc. It shall also be used for structural applications like external walling, roofing, flooring, curtain walls, work-site offices, in cabins of trucks, rail coaches etc.

Steel Sheeting and Steel Plates:

Steel sheeting and steel plates should be free from clinks, twists, offsets, warps etc. Their surface should be neat, clean and smooth. Before placing concrete, steel, forms shall be thoroughly cleaned off from all rust, dust and loose materials. Colour less oil or grease of approved quality shall be applied before placing steel.

The size of angles used for framing and bracing of steel plates should be sufficient to withstand the weight of concrete without forming clinks, twists, offsets, warps, etc. in the steel plates. Also, the gauge of steel sheeting used should not be higher than 18G.

Minimum two bracing angles should be provided along with angle framing while making the steel plates. It should be reverted or welded to suit the requirement of finish concrete surface. Minimum two rivets should be provided at all four corners and at junction of angle framing and bracing.

If the plates are to be welded, steel sheet and angle framing/bracing should be welded from sides and at back. Welding on sides should be buffed to make the sides smooth. Also, intermittent welding should be done to keep steel sheet and angle framing/bracing in one plane.

Expanded Metal Sheets:

The expanded metal sheets shall be free from flaws, joints, broken strands, laminations and other harmful surface defects. Expanded metal steel sheet shall conform to IS 412 except that blank sheets need not be with guaranteed mechanical properties. The size of the diamond mesh of expanded metal and dimensions of strands (width and thickness) shall be as specified. The tolerance on nominal weight of expanded metal sheets shall be of $\pm 10\%$.

Expanded metal in panels shall be in one whole piece, in each panel, as far as stock sizes permit. The expanded metal sheets shall be coated with suitable protective coating to prevent corrosion.

Centering:

The centering to be provided shall be got approved. It shall be sufficiently strong to ensure absolute safety of the formwork and concrete work before, during and after pouring concrete. Watch should be kept to see that behavior of centering and formwork is satisfactory during concreting. Erection should also be such that it would allow removal of forms in proper sequence without damaging either the concrete or the forms to be removed.

The props of centering shall be provided on firm foundation or base of sufficient strength to carry the

loads, without any settlement.

The centering and formwork shall be inspected and approved by the Engineer-in-charge, before concreting. But this will not relieve the Contractor of his responsibility for strength; adequacy and safety of formwork and centering. If there is a failure of formwork or centering, the Contractor shall be responsible for the damages to the work, injury to life and damage to property.

Cleaning & Treatment of Forms:

All rubbish, particularly Dead Mortar, dust etc. shall be removed from the interior of the form before the concrete is placed and the form work in contact with concrete shall be cleaned and thoroughly wetter or treated. The surface shall be coated with soap solution, applied before concreting is done. Soap solution for the oil or from oil of approved manufacture may be applied, incase steel shuttering is used. Care shall be taken that the coating is not applied on the construction joints surface and steel reinforcement bars.

Re-use of Forms:

Before re-use, all forms shall be inspected by the Engineer-in-charge and their suitability shall be ascertained. If, any of the forms are found to be unsuitable, they shall be immediately removed from the site. The forms ascertained for re-use, shall be scarred, cleaned, and joints gone over and repaired, wherever required. The inside surface shall be retreated to prevent adhesion to concrete.

Procedure while removing the form work:

All formwork shall be removed without such shocks or vibrations as would damage the reinforced concrete surface. Before the soffit formwork and struts are removed, the soffits and the concrete surface shall be exposed where necessary in order to ascertain that the concrete has sufficiently hardened.

Mild Steel Wire (Wire Gauze Jali):

Mild steel wire may be galvanized, as indicated. All finished steel wire shall be well sawn to the dimensions, and the size of the wire shall be as specified in item. The wire shall be sound, free from splits, surface flaw, rough, jagged and imperfect edges and other harmful surface defects and shall conform to I.S. 280-1978.

Preparation for Placing concrete

Concrete shall be placed only in the presence of a duly authorized representative of the Engineer-in-Charge. Concrete shall be placed and compacted before initial setting time ends and shall not be subsequently disturbed.

Placing of concrete shall not be started until sub grade/surface is ready and preparation of surface upon which concrete is to be laid, have been completely inspected and approved by Engineer-in-Charge. All absorptive surfaces against which concrete is to be laid shall be moistened adequately so that moisture is not be withdrawn from freshly placed concrete. The surfaces, however, shall be free from any water and slush.

Concrete shall be deposited in all cases as neatly as practicable directly in its final position and shall not be caused to flow in a manner to permit segregation. Excessive separation of the coarse aggregate caused by allowing the concrete to fall freely from too great a height or at too great an angle from the vertical shall not be permitted.

Placing and Compaction

Concrete shall be placed only in presence of a duly authorized representative of the Government. Concrete shall be placed and compacted before initial setting time and shall not be subsequently distributed.

Placing of concrete shall not be started until base is ready and preparation of surface upon which concrete is to be laid, have been completely inspected and approved by Engineer-in-charge. All absorptive surfaces against which concrete is to be laid shall be moistened adequately so that moisture shall not be withdrawn from freshly placed concrete. The surface, however, shall be free from any water and slush.

Concrete shall be deposited in all cases as nearly as practicable directly in its final position and shall not be caused to flow in a manner to permit segregation. Excessive separation of the coarse aggregate caused by allowing the concrete to fall freely from too great a height or at too great an angle from the

vertical shall not be permitted and where such separation would otherwise the contractor shall provide suitable means i.e. belt conveyor to convey the concrete without allowing such separation. Concrete may require to be placed by concrete pump as per side condition and as per direction of Engineer-in-charge. Compaction shall be done by vibrator in accordance with directions laid down I.S. 456

Finishing

All exposed concrete surfaces shall be cleaned of impurities, lumps of mortar or grout and unsightly stains. The finished surface shall be even, smooth and free from pockets and equivalent to that obtainable by effective use of a long handle steel trowel. Where the surface produced by lining machines meet the specified requirements, no further finishing operation will be required.

The surface of concrete finished shall be smooth and free from projections, honeycombing and other objectionable defects.

Repairs to concrete surface and additions where required shall be made by cutting regular opening into the concrete and placing fresh concrete to the required lines. Chipped opening shall be sharp and shall not be less than 75 mm in depth.

Dewatering

Necessary dewatering during process of concreting shall be done at no extra cost. Dewatering due to water entering due to any reason shall be resorted to and continued during preparation of sub grades, providing under drainage arrangements and placing of concrete till such period the concrete attains necessary strength. No separate payment shall be made for dewatering for presence of water due to any reason, as the same is deemed to have been included in rates.

Water Curing

Uniform top surface of concrete shall be kept continuously moist by covering it completely with wet burlap coarse canvas of jute as soon as the concrete has hardened sufficiently say, 4 to 6 hours after concrete placement. The burlap shall be kept continuously wet by spraying water for at least 12 hours. Thereafter curing by ponding shall be resorted to. Concrete cured with water shall be kept wet by ponding for at least 14 days. The suitable elevated tank shall be provided for continuous flow of water for the above purpose. Water lost by evaporation shall be replenished periodically to keep the surfaces continuously (not periodically) submerged under water.

Testing of Concrete and Acceptance of Work

Testing of concrete shall be carried out in accordance with relevant Indian Standards. The compressive strength requirements for the various mixes of concrete are as per Para "Strength requirements of Concrete"

Sampling Procedure

Sampling procedure: A random sampling procedure shall be adopted to ensure that each concrete batch has a reasonable chance of being tested i.e. the sampling shall be spread over the entire period of concreting and shall cover all mixing units.

Frequency

The minimum frequency of sampling of concrete of each grade shall be in accordance with following.

Quantity of Concrete m³	Number of Samples
1 to 5	1
6 to 15	2
16 to 30	3
31 to 50	4
51 and Above	4 plus one additional sample For each addi. 50 Cum or part there of

Additional samples may be required for various purposes such as to determine the strength of concrete at 7 days. The test results of the sample shall be the average of the strength of three specimens. The individual variation should not be more than +/- 15 % of the average. If more, the test results of the sample are invalid.

Test Specimen

Three test specimens shall be made from each sample for testing at 28 days. Additional cubes may be required for various purposes, such as to determine the strength of concrete at 7 days or at the time of striking formwork, or to determine the duration of curing or to check the testing cubes cured by accelerated methods as described in IS 9013. The specimen shall be tested as directed in IS 516.

Use of Ready Mix Concrete:

Use of RMC is permitted only in the case of emergency conditions. In such case, the mix design of the RMC supplier shall be submitted for approval. The other provisions viz. grade of concrete, cement level, use of more or less cement, recovery for cement etc. shall be as per Para-5 – Controlled Concrete.

In the case of use of RMC, computerized delivery tickets with details of time of production of concrete, grade of concrete, quantity of concrete, detailed batch report showing consumption of various ingredients etc. shall be submitted to the department. Excise and Tax paid Bills of RMC shall also be submitted. No extra charges for lead, use of RMC etc. shall be paid separately.

Mode of Measurement and Payment

The concrete work shall be measured in length, breadth and depth as specified on drawing or as directed, correct up to nearest centimeters and cubical content shall be worked out nearest centimeter and cubical content shall be worked out nearest up to two places or decimals.

The unit rate also includes costs of all material, transport with all lead and lifts, mixing, formwork, conveying, placing, pumping, pouring, making joints, vibrating, compacting, smooth finishing, curing, forming etc.

The payment will be made on cubic meter of the completed work with all lifts and lead.

The unit rate quoted by the bidder for the respective item shall be deemed to have been included the requirement of cement for miscellaneous operations like priming of mixer, laying cement slurry for successive lifts, finishing of concrete etc. also.

The rate shall be inclusive of chemical admixture like plasticizer etc. No additional payment shall be paid on this account.

The rate of item is inclusive of cost of concrete, from plant to site, octroi, transportation, all other taxes, etc. complete.

The payment shall be made on Cubic Meter basis.

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ITEM NO.5:

providing and fixing in position(different diameter) I.S.,NP-3 class reinforced pipe with caulking the joints with cement mortar 1:1 proportion,using jute string soaked in cement slurry, finishing joints and laying pipes to the designed grade and levels, curing etc. complete for all leads and lifts.

(NP-3 class 1200 mm dia pipe.)

Workmanship and finishing:

Pipe shall be of required strength and free from crack. The ends of the pipe shall be square with their longitudinal axis so that when placed in straight line in the trenches. No penning between ends in

contract shall exceed 3 mm.

The outside and inside surfaces of the pipes shall be smooth dense and hard and shall not be coated with cement wash or other preparation. The pipes shall be free from defects resulting from imperfect grading of the accounts mixing or molding. Pipes shall be free from local or bulges greater than 3 mm in depth and extending over length in any direction greater than twice the thickness of barrel. The pipes brought at the site of work shall be inspected by the Engineer-in-Charge physically, and he shall satisfy that pipes are not containing cracks, are well furnished and edge are not broken.

Handling and laying of pipes:

Loading and transporting unloading of R.C.C. NP-3 class pipes shall be done carefully; handling shall be such as to avoid impact. Gradually unloading but inclined plain or chain block is recommended. All the sections and connection shall be inspected carefully before being laid, any broken or defective pipes or connections shall not be used. If trenches are found insufficient in width or looking improper slopes as required, the same shall be widened/deepened by the contractor to get proper sub grade and working width as shown in drawing or as per directions of the Engineer-in-Charge the pipe shall laid true to line and grade as specified.

Pipe laying:

The R.C.C. NP-3 class of required dia meter should be provided confirming to IS – 458 – 2003 or its latest IS : And Other Relevant IS : For materials, testing, and reinforcement etc.

During operation of loading, transportation and unloading at site of work due care shall be taken to avoid damage to pipe or accident. To avoid damage due to impact necessary arrangement shall be done. Any damage occurred to pip during operation by contractor should be rejected. Before laying the pipes to its final positioning foundation trench, the grade and width of trench shall be checked and preyed by the Engineer. To ensure check over grade of pipe in the excavated trench, wooden page shall be fixed at 25 mt. or closer interval along the length. A cotton string should be stretched between two consecutive wooden peg and the depth and width shall be finally checked.

After excavation for pipe laying in true to line and level the surface shall be watered and compucted properly. There after the bed concrete of M-10 grade of 15 cm thick shall be provided in accordance with relevant concrete section.

After checking by site supervisor, the pipe laying in trench shall be resorted. The pipe shall be laid using chain pulley with three – peg stander manually by applying cotton rope at both ends of pipe is allowed to slide. In end of each pipe one collar shall be ring up after to the free movement the pip line between two conservation kundies become ready, it shall be checked up for line and level. The pipeline should be straight line from structure.

Before starting joint works, necessary reference points at intermediate shall be fixed by the contractor.

Preparing pipe joints with collar:

R.C.C. pipeline shall start from off take structure of turn out kundies or wells constructed in brick masonry or as instructed by Engineer-in-Charge. The end of the first pipe shall be embedded in the structure and finished flush with the surface structure. The jute cloth coated piston with handle shall be inserted in the first pipe for laying each subsequent pipe the pipe shall be put along the cut trench on original ground at the bottom of the trench. If they are placed at the bottom of the trench a working space of about two pipe lengths shall be kept free of each pipe. The joints as per the end of each subsequent pipe shall be prepared in the following manner.

- 1) Collar shall be inserted on the previous pipe and left at a workable distance away from the joint.
- 2) The alignment of the next pipe to be laid shall be ensured by erecting intermediate reference

points and by stretching string over these reference points. The grade of pipeline should also be ensured.

3) A pair of wooden wedges shall be placed on both sides and both end of the pipe being laid at to 30 to 40 cm away from and of second pipe and the pipe shall be brought to required level by striking the wooden wedges as required. Proper fixing of pipe shall be ensured. So the line level is maintained during operation of fixing the collar to the pipe ends.

4) Move jute cloth coated piston below the joint to be done.

5) A jute canvass of 10 cm width dipped in cement slurry shall be wound on the joint for one round ensuring overlap of minimum 10 cm.

6) Moreover the collar, placed on the previous pipe careful towards the joint to be demand place in such a way that the width of the collar equally covers both the pipes, for this purpose reference mark on the pipe shall be done previously.

7) Check up its position equally on both sides of joints

8) For ensuring that the pipes get placed wages as co-centric and has uniform regular space all round place wooden wages as indicated in the drawing or as directed, on previous pipe ensuring that the insertion or wedge and is about 2.0 c.m. to 3.0 cm. Setup M.S. plate ring on other side of the collar over the next pipe and finally ensure even annular space between pipe and collar.

9) The Cement mortar of 1:1 proportion shall be inserted in the annular or space with the help of caulking iron tool and shall be rammed till mortar filling is dense. Go on periodically the jute cloth piston burrow the joint till filling of mortar in annular space is completed. Due to repeated operation jute cloth around the piston shall periodically replaced as instructed and required.

10) Withdraw the wooden wedge and M.S. plate ring carefully and fill up gape with cement mortar 1:1 also prepared the filled joint as per drawing or as directed with 1:1 cement sand mortar.

11) Next day the full pipe joint shall be constructed with cement concrete M-15 grade concrete as per detailed drawing or as directed over the pipe joints laid in in C.M. 1:1 of previous day, for cement concrete M – 15 grade specification of Item of M-15 grade cement concrete shall be followed. The necessary concrete shall be prepared as directed and shall be placed centrally cover the pipe joints as per marking of pipe and over previously placed cement concrete M-10 below pipe bed cement concrete M-10 & M-15 shall be ensured as separate item and paid separately.

12) Repeat the operation (1) to (11) till completion required length of work.

Curing and refilling:

i. Cover-up the joint with gunny bag and protect the joint from direct sunrays. The joint shall be cured for 14 days.

ii. After 14 days curing period is over, the trench shall be filled in two stages. In first stage the trench shall be filled up to top of the pipe. This filling shall be below and around the pipe. In second stage rest of the trench shall be filled up to the original ground level and the filling shall be well watered.

Testing:

The contractor shall submit Manufacturer's Test Certificate (MTC) for all NP3 RCC pipes supplied for the pipe culvert work. The certificate shall confirm that the pipes conform to relevant provisions of Bureau of Indian Standards IS 458 and satisfy the required tests for NP3 class pipes, including Three Edge Bearing Test, Hydrostatic Test, and other quality control parameters specified in the standard. Only pipes

accompanied by valid manufacturer's test certificates shall be permitted for use in the work.

Mode of Measurements and Payment:

The measurement shall be on running meter basis of the pipe finally accepted and laid with satisfactory for leakage and joints completed with collars.

The payment shall be at the tender rate per running meter basis. This shall including supply and laying of pipes including testing and payment of all specification including, finishing the joint with 1:1 cement mortar, curing all materials, labour and tools and pants etc. completed.

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ITEM NO.6:

Earth Work in embakment From borropits in all sorts of soil and soft murrum or other suitable strata as directed including breaking the clods and dressing to the design sections including cutting the proud section with lead as under and all lift including site clearing etc. complete. for all canal capacity (Dumper capacity = 14 M.T)

(a) 0 to 30 Mt

This item includes watering and consolidation at O.M.C., all the materials placed in the embankment properly watered and compacted to at least 90% proctor density.

The soil shall have therefore to be brought to the optimum moisture content as determined in the laboratory of the department from time to time by adding amount of water on the layers of earth laid in embankment sufficiently in advance of commencing compaction of layers. The required amount of water to be sprinkled for a specified quantity of soil shall be first calculated particularly when it is to be added at the embankment portion.

Each layers is to be compacted at the specified density. Density tests will be conducted from time to time on site to ascertain whether the compaction is attained as specified above. For every 1000 m² of compacted earth work 1 (One) density tests shall be carried out. However at least one density test shall be carried out for every layer 15 cms. Necessary unskilled labour required to carry out such density tests shall have to be provided by the contractor.

Mode of Measurement And Payment:-

The mode of measurement and payment shall be on Cubic meter basis works out on cross section basis. The rate quoted under this item shall be for watering the earth work rolling, compacting, ramming to bring it to O.M.C. as per specification and as directed including all material, labour, tools and plants required for the work with all lead and lifts etc. complete.

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ITEM NO.7:

Providing Hard Murrum including spreading the same and dressing the top surface in required grade and camber etc. comp.

(a) 0 to 30 m

Material:

Material for the purpose shall be of approved quality. Any material which is found inferior shall be rejected and the contractor shall remove such rejected material from the site at his own cost. The material shall be collected from quarries approved by the Executive Engineer. The material shall be granular and gritty.

Workmanship:

Spreading of material shall be started after the full supply of Material and After clearing of site. Permission of the Engineer-in-charge shall be obtained before spreading. It shall be seen that the formation is dressed to the required camber and grade. If the murrum is to be spread over the metaled surface then the spreading shall be uniform and as its has to act as binding surface it shall be used for filling the interstices of metal and forming a smooth running surface as far as possible. Murrum blindage shall be specified as blindage shall be spread evenly with a twisting motion of the baskets. No more Murrum shall be used then specified as blindage. The rate is for gross measurements and no deduction of voids shall be made. I the murrum is to be spread over earthen embankment as a sub-base or for side shoulders or as blindage, it shall be spread in a manner as directed by the Engineer-in-charge and as per required width and thickness. The contractor shall make good all unevenness, depression, projections etc., during consolidation work. Rate of this item includes all these operation except consolidation. The payment shall be made on cum. basis.

Deputy Executive Engineer
Ahmedabad. Irrigation Sub Division
Ahmedabad.

Executive Engineer
Ahmedabad Irrigation Division
Ahmedabad.

Special Conditions

- 1. Good quality geotagged color photographs of before work, during work and after work shall be captured from same angle and same place and same shall be submitted in 3 sets.**
- 2. 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 bidder shall upload geotagged photographs (showing latitude and longitude) of the site. The costs of visiting the site shall be at the Bidder's own expense.**

Deputy Executive Engineer
Ahmedabad. Irrigation Sub Division
Ahmedabad.

Executive Engineer
Ahmedabad Irrigation Division
Ahmedabad.

Volume - III

SECTION - 6
FORM OF BID

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 Contact 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
BILL OF QUANTITIES
(Schedule- B)

BILL OF QUANTITIES

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. References 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 payment shall be in accordance with the specification for NWRWSK Department. For building works specifications for building and Road Department 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 sledgehammers, 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.

BILL OF QUANTITIES

Name of Work		Construction of Pipe Culvert bridge on Bhadar River at various Location Near Village-Adval,,Ta- Dhandhuka,Dist-Ahemdabad			
Ite m No	Description of Item	Total Quantity	Unit	Rate in Rs (Excluding GST)	Amount in Rs
1	Excavation in all sorts of soil (including wet and slushy condition of soil) with yellow, sandy, gravelly soil including soft murrum & H.M. including sorting & stacking and depositing the excavated stuff in uniform layers as and where directed upto lead of 30 mt. and lift as shown below including clearing the site etc. complete. (Including dewatering) (Dumper capacity = 14 M.T)(B) For foudation trenches of C.D. work (a)0 to 3 Mt. depth	385.92	Cum.	75	28944.00
2	Providing and laying foundation concrete of proportion as under by using cement, sand m and machine crushed course aggregate laid in situ including necessary temping, smooth finishing, watering and curing as directed of with all leads and lifts etc completea) PCC 1:3:6 (MSA 40)	122.92	Cum.	3559	437472.28
3	Providing and laying C.C. 1:2:4 grade using cement,sand and crushed metal including providing and erecting necessary form work, centering , vibrating, smooth finishing,watering and curing as directed with all leads and lifts etc.complete .(a)sub structures (MSA20)	205.28	Cum.	4677	960094.56
4	Providing and laying C.C. 1:2:4 grade using cement,sand and crushed metal including providing and erecting necessary form work, centering , vibrating, smooth finishing,watering and curing as directed with all leads and lifts etc.complete .(b)Super structures (MSA 20)	228.84	Cum.	4815	1101864.60
5	providing and fixing in position(different diameter) I.S.,NP-3 class reinforced pipe with caulking the joints with cement mortar 1:1 proportion,using jute string soaked in cement slurry, finishing joints and laying pipes to the designed grade and levels, curing etc. complete for all leads and lifts. (NP-3 class 1200 mm dia pipe.)	150	Meter.	5955.3	893295.00
6	Earth Work in embakment From borropits in all sorts of soil and soft murrum or other suitable strata as directed including breaking the clods and dressing to the design sections including cutting the proud section with lead as under	1500	Cum.	73	109500.00

	and all lift including site clearing etc. complete. for all canal capacity (Dumper capacity = 14 M.T)(a) 0 to 30 Mt				
7	Providing Hard Murrum including spreading the same and dressing the top surface in required grade and camber etc. comp.(a) 0 to 30 m	375	Cum.	199	74625.00
Total in RS					3605795.44
In Words Rupees Thirty Six Lakhs FiveThousands Seven Hundred Ninty Five rupees and Fourty Four Paisa only					

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

(A) — 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 detailed specification and details of work as directed by the Engineer-In-Charge for which no extra payment 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 at a source while making payments of bills
4	In all R.C.C. Items in Rate Analysis Standard Cement Consumption has been taken as per Govt. G.R. NO.: MIS102010/17/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.
	<div>Deputy Executive Engineer Ahmedabad Irrigation Sub Division Ahmedabad</div> <div>Executive Engineer Ahmedabad Irrigation Division Ahmedabad</div>

SECTION - 8

SECURITIES AND OTHER FORMS

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 refuse 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 note 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-----

WITNESS -----

SEAL -----

(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. Date 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 sum specified therein as security for compliance with his obligation in accordance with the Contract.

AND WHEREAS we have agreed to give the Contractors 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 limits of ----- (amount of guarantee) as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the contractor before presenting is 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 thereunder or of any of the Contract documents which may be made between your 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 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 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 sum specified therein as security for compliance with his obligation in accordance with the Contract.

AND WHEREAS we have agreed to give the Contractors 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 limits of ----- (amount of guarantee) as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the contractor before presenting is 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 thereunder or of any of the Contract documents which may be made between your 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 of financial institution), as instructed by the Contractor, agree unconditionally and irrevocably to guarantee as primary obligator and not as Surety merely, the payment to _____ (name of Employer) on his first demand without whatsoever right of obligation on our part and without his first claim to the Contractor, in the amount not exceeding _____ (amount of guarantee)* _____ (in words)

We further agree that no change or addition to or other modifications of the terms of the Contractor or Works to be performed thereunder 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'S TRULY

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

(Letter head 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 our 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 executive 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 there to 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

Volume - IV

SECTION - 9
DRAWINGS

Volume - V

SECTION - 10
DOCUMENTS TO BE FURNISHED BY BIDDER