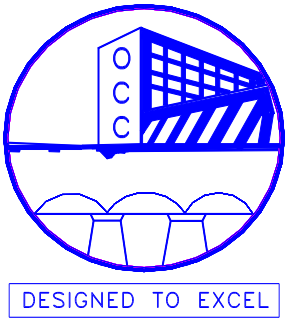

ODISHA CONSTRUCTION CORPORATION LTD.

(A Govt. of Odisha Undertaking)

Gopabandhu Nagar, Unit-VIII, Bhubaneswar.

COVER – I

(TECHNICAL BID)

(PERCENTAGE RATE TENDER)

e-procurement Notice No.31/OCCL/2020-21 (on-line)

Bid identification No. OCCL-CGP/06/2020-21

NAME OF WORK

RENOVATION OF OLD GOBARI DRAINAGE CUT FROM RD 0.00 KM TO 14.62 KM OUTFALLING TO GOBARI DRAINAGE SYSTEM

Managing Director,
OCC Ltd. Bhubaneswar

CONTRACTOR

SENIOR MANAGER (CIVIL)

PARTICULARS OF TENDER

1	Name of work:	**Renovation of Old Gobari Drainage Cut from RD 0.00 KM to 14.62 Km out falling to Gobari Drainage System**
2	Approximate value of the work:	Rs. 812.94 Lakhs (excluding GST)
3	E.M.D	Rs. 8,13,000.00
4	Period of Completion	11 (Eleven) Calendar months (including rainy season)
5	Class of Contractor	C-I class of contractor in OCC Ltd. If not, enlisted agency is to get enlisted in OCC Ltd as C-I class of contractor preferably before submission of tender but Mandatory before drawl of agreement. The enlistment form of OCCL is available in the website of OCC Ltd. i.e. www.odishaconstruction.com or may be collected from OCC Ltd. Head Office and should be submitted at the same office along with the necessary documents and fees before uploading the bid in portal positively failing which it will not be considered for the present work. In case intending bidder applied for such Certificate but not received up to the time of submission of bid, he has to upload certificate of Registration of concerned State Government/ Railway/ CPWD/ Government bodies along with copy of the application for C-I enlistment in OCCL
6	Cost of Bid Documents	Rs.11,800.00 (including GST)
7	Availability of Tender in website	From 11.02.2021, 10.00 AM to 25.02.2021, 5.30 PM
8	Submission of Bid On-line	From 11.02.2021, 10.00 AM to 25.02.2021, 5.30 PM
9	Pre-Bid Meeting	Not applicable
10	Date of Opening of Technical Bid	26.02.2021 at 12.00 Noon at Head Office, OCC Ltd, Bhubaneswar.
11	Date of opening of Financial Bid	To be intimated to qualified bidders after evaluation of Technical Bid by registered post/Speed Post/E-mail.

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SECTION-I

NOTICE INVITING TENDER
&
DETAILED TENDER CALL NOTICE

ODISHA CONSTRUCTION CORPORATION LIMITED
BHUBANESWAR, ODISHA,
PIN: 751012, Tel No.(0674) 2562020,
e-Mail: theoccltd@odishaconstruction.com
GSTIN- 21AAACO2571K2ZM

"e" Procurement Notice No- 31/OCCL/2020-21 (on-line)

Type of Work – Renovation of old Gobari drainage cut.
Total Nos of Works- 01 (one) No.
Period of Completion – 11 (Eleven) Calendar Months.

Procurement Officer	Bid Identification No	Amount Put to Tender (approx) (Rs. In lakhs)	Bid Security (Rs. In Lakhs)	Availability of Tender (on-line)	Submission of tender (on-line)
Managing Director	**OCCL-CGP/06/ 2020-21**	**Rs. 812.94 Lakhs**	**Rs. 8.13 Lakhs**	**From 11.02.2021, 10.00 AM to 25.02.2021 up to 5.30P.M.**	**From 11.02.2021, 10.00 AM to 25.02.2021 up to 5.30P.M.**

Date of Opening of the Technical Bid: **26.02.2021, 12.00 Noon**
Further details can be seen from the e-procurement portal: https://www.tendersodisha.gov.in

Sd/-09.02.2021
Managing Director, OCCL,

CONTRACTOR SENIOR MANAGER (CIVIL)

ODISHA CONSTRUCTION CORPORATION LTD.
(A Govt. of Odisha Undertaking)
Gopabandhu Nagar, Unit-VIII, Bhubaneswar.
DIST-Khordha-751012, Tel-0674-2562020, e-mail:theoccltd@odishaconstruction.com
(GSTIN-21AAACO2571K2ZM)

NOTICE INVITING TENDER

e-procurement Notice No – 31/OCCL/2020-21 (on-line)

The Managing Director, OCCL, Bhubaneswar on behalf of Odisha Construction Corporation Limited invites **on-line percentage rate tender** through e-Procurement in **double cover** system for execution of the following works. The agency must be enlisted as C-I class of contractor in OCC Ltd. If not enlisted, agency is to get enlisted in OCC Ltd as C-I class of contractor preferably before submission of tender but Mandatory before drawl of agreement. The enlistment form of OCCL is available in the website of OCC Ltd. i.e. www.odishaconstruction.com or may be collected from OCC Ltd. Head Office and should be submitted at the same office along with the necessary documents and fees before uploading the bid in portal positively failing which it will not be considered for the present work. In case intending bidder applied for such Certificate but not received up to the time of submission of bid, he has to upload certificate of Registration of concerned State Government/ Railway/ CPWD/ Government bodies along with copy of the application for C-I enlistment in OCCL.

Sl No	Type of Work	Bid Identification No.	Amount put to tender	Period of completion	Tender Fee (through on-line transfer)	EMD/ Bid Security (through on-line transfer)
1	**2**	**3**	**4**	**5**	**6**	**7**
01	Renovation of Old Gobari drainage Cut from RD 0.00 Km to 14.62 Km out falling to Gobari drainage system	OCCL-CGP/06/2020-21	Rs. 812.94 Lakhs	11 (Eleven calendar months)	Rs. 11,800/- inclusive GST (Non Refundable)	Rs. 8.13 Lakhs

1. The Bidders shall transfer online Earnest money deposit / Bid Security amount specified for the works on the table column 7 above as part of its bid through a process as mentioned in DTCN.
2. The bidder shall transfer online cost of bid documents of Rs.11,800.00 for each work as shown in column 6 above through a process as mentioned in DTCN.
3. **Procurement Details:**

Procurement Officer	Availability of Tender On-line	Submission of Bid On-line	Date & Time of opening of Tender	
			Technical Bid	Financial Bid
1	**2**	**3**	**5**	**6**
Managing Director, OCCL, Bhubaneswar.	**From 11.02.2021, 10.00 A. M to 25.02.2021 5.30 P.M**	**From 11.02.2021 10.00 A. M to 25.02.2021 5.30 P.M**	**26.02.2021 at 12.00 Noon** at Head Office, OCCL, Bhubaneswar	To be intimated to qualified bidders after evaluation of Technical Bid.

4. Tender should be submitted On-line in www.tendersodisha.gov.in only. Bid document consisting of qualification, information and eligibility criteria of bidders, specification and Bill of Quantities of the works are available in the web-sites www.tendersodisha.gov.in & www.odishaconstruction.com and the set of terms and conditions of contract and other necessary documents can be seen in the web-site till last date of submission of Bid.

5. Bid validity period of the Tender is for a period of **90 (ninety) days** from the last date of submission of bid. **Conditional bid is not acceptable & subjected to forfeiture of EMD/Bid Security**. If any bidder withdraws his Bid/ Tender before the said period or makes any modification in the terms and condition of the bid, the EMD deposited at the time of submission of tender/bid shall stand forfeited. Validity of tenders can also be extended if required without any monetary compensation.

6. No Engineer of Gazetted rank or other Gazetted Officer employed in Engineering or Administrative duties in any Engineering Department of the State Government/Corporation is allowed to work as a Contractor for a period of two years after his retirement from Government Service/Corporation service, without Government/Corporation permission.

7. The scanned copy(s) of **(i) Affidavit duly registered before NOTARY regarding authenticity of documents (Annexure-A), (ii) No Relation Certificate (Annexure-B), (iii) Undertaking to pay minimum wages (Annexure-C), (iv) Undertaking to pay royalty as per prevailing rate during the time of execution (Annexure-E), (v) GST Registration Certificate, (vi) PAN Card, (vii) EPF registration certificate, (viii) Valid OCC Ltd enlistment certificate and all other required documents as per the relevant clauses of DTCN and ITB should be uploaded in web-site** www.tendersodisha.gov.in **at the time of submission of Bid.** The above mentioned affidavit, No relationship Certificate, undertakings as specified in Annexure A to C & Annexure-E must be as per the formats prescribed in the bid documents only. ***If the affidavit, No relationship Certificate & the undertakings are submitted in any other format, then the tender inviting officer may reject the bid.***

   The bidders not registered under GST in Odisha are required to **submit an undertaking** in the form of an affidavit that, they are not registered under GST act in the state of Odisha as they have not started any business in the state and they have no liabilities under the said act. The successful bidders have to produce their documents regarding GST registration documents in the State of Odisha before drawal of the agreement.

   The successful L-1 bidder has to submit the original documents as cited above from Sl.No (i) to Sl.No. (iv) under clause no. 7 of NIT along with other necessary documents before acceptance of the tender.

8. Additional Performance Security shall be submitted by the bidder when the bid amount is less than the estimated cost put to tender. In such an event, only the successful bidder who has quoted less bid price/rates than the estimated cost put to tender shall have to furnish exact amount of differential cost i.e. estimated cost put to tender minus the quoted amount as Additional Performance Security (APS) in shape of Term Deposit Receipt (TDR) pledged in favour of Odisha

Construction Corporation Limited/ Bank Guarantee in prescribed format **(Annexure-D)** in favour of Odisha Construction Corporation Limited from any nationalized/scheduled bank in India counter guaranteed by its local branch at Bhubaneswar within seven days of issue of Letter of Acceptance (LoA) by Odisha Construction Corporation Limited (by email) to the successful bidder otherwise the bid of the successful bidder shall be cancelled and the Earnest Money Deposit/Bid Security shall be forfeited. Further proceedings for blacklisting shall be initiated against the bidder.

9. The technical bid documents will be opened by the undersigned/authorized officer(s) on **dated. 26.02.2021 at 12.00 Noon** in the Head Office of the Odisha Construction Corporation Limited, Unit-VIII, Bhubaneswar in presence of the bidders or their authorized representatives who wish to attend. If the Office happened to be closed on the date of opening of the bid the same will be opened on the next working day at the same time and venue. After evaluation of the documents contained in technical bid, the financial bids of the technically responsive bidders will be opened. The date, time and place of opening the financial bid will be intimated to the eligible qualified bidders through e-mails/letters.

10. The bidders have to quote the **percentage rate** excluding GST (Goods and Service Tax). GST as applicable will be paid extra.

11. The bidder may be asked in email/letters to clarify on the uploaded documents provided in the Technical Bid if necessary, with respect to any doubts or illegible documents. The authority inviting bid reserves the right to accept any additional required document for clarification on uploaded documents.

12. **Joint venture is not allowed.**

13. The bidders seeking clarification, if any regarding the tender can contact office of the undersigned during office hour on any working days from **11.02.2021 to 17.02.2021 upto 3.00 P.M**

14. Authority reserves the right to reject / Cancel the tender without assigning any reason thereof.

15. Other details can be seen in the bid documents, which is available in web-site www.tendersodisha.gov.in & www.odishaconstruction.com.

16. The agency must be enlisted as C-I class of contractor in OCC Ltd. If not, enlisted agency is to get enlisted in OCC Ltd as C-I class of contractor preferably before submission of tender but Mandatory before drawl of agreement. The enlistment form of OCCL is available in the website of OCC Ltd. i.e. www.odishaconstruction.com or may be collected from OCC Ltd. Head Office and should be submitted at the same office along with the necessary documents and fees before uploading the bid in portal positively failing which it will not be considered for the present work. In case intending bidder applied for such Certificate but not received up to the time of submission of bid, he has to upload certificate of Registration of concerned State Government/ Railway/ CPWD/ Government bodies along with copy of the application for C-I enlistment in OCCL.

17. **DELETED**

18. Any dispute arising out of the above tender call notice shall be subject to Jurisdiction of Hon'ble High Court of Odisha at Cuttack and their subordinate Courts at Bhubaneswar only.

Managing Director

CONTRACTOR SENIOR MANAGER (CIVIL)

ODISHA CONSTRUCTION CORPORATION LTD.

(A Govt. of Odisha Undertaking)

Gopabandhu Nagar, Unit-VIII, Bhubaneswar.

DETAILED TENDER CALL NOTICE

1. The Managing Director, Odisha Construction Corporation Limited invites on-line percentage rate tender through e-procurement in prescribed form. Enlisted C-I contractors of OCC Ltd can submit the bid. Any Contractor of special / super class registered with works Department, Government of Odisha or equivalent class registered with CPWD / Railway / MES or other State Governments or Central or State PSUs are also invited for participation in the bid. But they have to get themselves enlisted in OCC Ltd preferably before submission of tender but Mandatory before drawl of agreement. The enlistment form of OCCL is available in the website of OCC Ltd. i.e. www.odishaconstruction.com or may be collected from OCC Ltd. Head Office and should be submitted at the same office along with the necessary documents and fees before uploading the bid in portal positively failing which it will not be considered for the present work. In case intending bidder applied for such Certificate but not received up to the time of submission of bid, he has to upload certificate of Registration of concerned State Government/ Railway/ CPWD/ Government bodies along with copy of the application for C-I enlistment in OCCL. All the Contractors are to be registered in the State Govt. portal and must possess compatible digital signature certificate for online bidding. The website for online bidding is **www.tendersodisha.gov.in** for the work **"Renovation of Old Gobari Drainage Cut from RD 0.00 KM to 14.62 Km out falling to Gobari Drainage System".**
2. The tender documents can be downloaded from the Govt website www.tendersodisha.gov.in or www.odishaconstruction.com from date. **11.02.2021 at 10.00 AM to 25.02.2021 up to 5.30 P.M.** for the work **"Renovation of Old Gobari Drainage Cut from RD 0.00 KM to 14.62 Km out falling to Gobari Drainage System" on online transfer of Rs.11,800/-** (Rupees eleven thousand eight hundred only) **through a process as mentioned in DTCN**. The bid will be received through e-procurement portal**,** www.tendersodisha.gov.in from dt. **11.02.2021 at 10.00 AM to 25.02.2021 up to 5.30 P.M.** Each set of bid document contains Technical bid (cover-I) and Price bid (cover-II) i.e. Bill of Quantities in Intelligent MS Excel Format. The bid cover-I will be opened on **26.02.2021 at 12.00 Noon.** in the Head Office of OCC Ltd, Unit-VIII, Bhubaneswar in presence of the bidders or their authorized agents. The bidders who participated in the on-line bidding can also witness opening of the bid from any system logging in to the portal away from opening place. The bids can only be opened by the pre-designated officials after the opening time mentioned in the bid. In the event of the specified date of bid opening being declared a holiday the bid will be opened at the same time and same venue in the next working day. Date, time and place of opening of cover-II (price bid) shall be intimated separately to those bidders who will be found eligible after evaluation of cover-I (Technical bid). The intimation letter will be sent both through their e-mail address and postal address.
3. The approx. value of the work tendered for **Rs.812.94 Lakhs (excluding GST)**

4. The bidders shall prepare the documents and upload the scanned typed document in PDF format and BOQ in Excel format (or as specified in the portal) in appropriate place. **Tender must be submitted on-line in the website www.tendersodisha.gov.in only**.
5. No tenderer will be permitted to furnish their bid in their own manuscript.

6. **BID SECURITY:**

(i) The Bidder shall transfer online the EMD / Bid security for the amount mentioned in the NIT and DTCN through a process mentioned in Works Department O.M. No 6785/W Dt 09.05.2017(As stipulated in Cl. No. 85 of DTCN).

(ii) The Bid shall be declared non-responsive and shall be rejected, if submitted without an acceptable Bid Security.

(iii) The Bid Security of the successful bidder will be discharged when the bidder has signed the Agreement and furnished the required Performance Security and Additional Performance security if any.

The Bid Security may be forfeited

- If the bidder withdraws the bid after opening of the bid but within the period of validity.
- If the Bidder seeks any revision of rates or backs out of the bid claiming for not having referred to any or all documents provided in the Bid by the Officer Inviting the Bids.
- If the Bidder fails to submit the original documents within the stipulated date pursuant to clause No.7 of NIT.
- In the case of a successful bidder, if the bidder fails within the specified time limit to **(a)** Sign the Agreement; or **(b)** Furnish the required Performance Security including additional performance security if any.

7. A bidder should submit only one bid.

8. The tender is to be submitted on-line in the web-site **www.tendersodisha.gov.in** containing scanned copies of valid OCCL enlistment certificate, PAN card, GST No, affidavit duly notarised regarding authenticity of document, undertaking & No-relationship certificate as per the relevant clauses of this DTCN and special conditions. The bidder shall only submit single copy of the document. He is required to check the documents uploaded with the requirement asked for in the bid. Only after satisfying that all the documents have been uploaded, he should activate submit button. His bids shall not be considered responsive and action as per relevant clauses shall be taken if he does not provide the required documents or provided illegible documents. Clarity of the documents may be ensured by taking out a sample print out."

9. If any further necessary information is required, the bidder can seek clarification on the bids within **11.02.2021 to 17.02.2021 up to 3.00 P.M** from the Managing Director/ authorized officer of OCC Ltd at Head Office of the Odisha Construction Corporation Limited, Bhubaneswar.

10. The EMD shall only be paid through online transfer as per the procedure specified in the DTCN.

11. **The tender accepting authority will verify the originals of all the scanned documents of the successful lowest bidder before acceptance of the tender.**

12. In the event of failure on the part of the bidder to produce the original documents, he will be debarred in future from participating in any tender for 3 years and will be blacklisted by the competent authority.

13. All charges towards quality control test will be borne by the Contractor.

14. The work is required to be completed in all respect within **11 (Eleven) Calendar Months (including rainy seasons)** from the date of issue of Work Order. Failure to complete the work in due time without sufficient reason, the contract may be rescinded with penalty or as deemed proper by the competent authority.
15. Before acceptance of tender, the successful bidder will be required to submit a work programme and milestone basing on the financial achievement so as to complete the work within the stipulated time and in case of failure on the part of the agency to achieve the milestone, liquidated damage as applicable will be imposed
16. The date of commencement of the work shall be as notified in the work order.

17. The specification and scope for the work can be seen from the Govt. website www.tendersodisha.gov.in & OCCL website www.odishaconstruction.com during the period of availability of the tender.

18. The tenderers shall carefully study the tentative drawing and specification applicable to the contract and documents which will form as part of the agreement to be entered into by the accepted tenderer. The detailed standard specifications for Odisha and other said relevant specification and drawings are available in the office of the Senior Manager (Civil), OCCL, Cuttack Group of Projects, Cuttack.
19. Before quoting their rates, every tenderer is expected to inspect the proposed work site. He should also inspect the quarries and locality of the work and satisfy himself about the quality and availability of construction materials including the medical aids, labour and food stuff etc. In every case the construction materials must comply with the relevant specifications. **The tenderer has to ensure about the safe disposal of dredged materials at designated site with all leads and lifts as per the instruction of Engineer-in-Charge for which his quoted rate should cover cost, mobilization, demobilization of men & machineries including all incidental charges and no extra payment will be made by OCC Ltd.**

    The tenderer will be deemed to have satisfied himself that the percentage Rate quoted by them in the tender will be adequate to complete the work according to the specifications and conditions attached to and that they have taken into account all conditions, difficulties that may be encountered during its progress and to have quoted labour rates and materials including cost of dewatering & haul road with all taxes including royalty excluding GST as applicable, lead, lifts, de-lifts, loading and unloading and freight for materials and all other charges necessary for completion of the work to the entire satisfaction of the Engineer-in-charge of the work and his authorized subordinates. Complains at future date, that the availability of materials, labour or any other factor have been misjudged will not be entertained. It should be understood clearly that no claim whatsoever will be entertained afterwards on the plea of non availability of proper quantity

and quality of materials or difficulty in disposal of dredged materials including food stuff or for any other reasons.

20. Each tenderer must quote a definite percentage rate for the work in the BoQ, which will form a part of the contract. (Tenders containing indefinite terms such as estimated rates will not be considered.) Submission of Bids through the e-Procurement portal **www.tendersodisha.gov.in**. Bill of Quantities in Intelligent MS Excel Format shall be made available to the bidder. The bidder shall fill percentage rate in prescribed proforma and should not leave any cell blank.

21. If the rate quoted by the bidder is less than 15% of the tendered amount then such a bid shall be rejected & the tender shall be finalized basing on merits of rest bids. But if more than one bid is quoted at same rate up to 14.99% (Decimals up to two numbers will be taken for all practical purposes) less than the estimated cost, the tender accepting authority will finalize the bid through a transparent lottery system, where all such bidders/their authorized representatives, the General Manager (Civil), Head Office, F.A. & C.A.O, OCCL, and Senior Manager (Civil), Project Management will remain present.

22. Sample of coarse aggregates and fine aggregates to be used for the work are to be collected and deposited at office of the respective quality control division of Department of Water Resources, Odisha before procurement for testing and acceptance, quoting the name of the quarry with dated signature of the contractor and Senior Manager (Civil) in charge of the work. All the charges of quality control test of materials will be borne by the Contractor.

23. Bidders are to submit only the original BOQ (in Excel format) uploaded by procurement Officer (Officer inviting Tender) after entering the relevant fields without any alteration/ deletion/ modification. Multiple BOQ submission by bidder shall lead to cancellation of bid. **In the percentage rate tender, the bidder quoting Zero percentage is valid and will be taken at par with the estimated rate of the work put to tender.**

24. The bidders shall write their name in the space provided in the specified location in the protected Bill of Quantities (BOQ) published by the Officer inviting Tender. The bidder shall mention percentage excess or less up to two decimal places only.

25. Submission of Bids through the e-Procurement Portal i.e. **www.tendersodisha.gov.in**, the bidder can submit the scanned copy of the documents in the designated locations of Technical Bid and Financial Bid. Submission of document shall be effected by using DSC of appropriate class and thus shall be in encrypted form.

26. The online bidder shall digitally sign on all statements, documents, certificates uploaded by him, owning responsibility for their correctness/authenticity as per IT Act 2000, If any of the information furnished by the bidder is found to be false /fabricated/ bogus, his EMD/ Bid Security shall stand forfeited & their registration in the portal shall be blocked and the bidder is liable to be blacklisted.

27. The scanned copy(s) of **(i) Affidavit duly registered before NOTARY regarding authenticity of documents (Annexure-A), (ii) No Relation Certificate (Annexure-B), (iii) Undertaking to pay minimum wages (Annexure-C), (iv) Undertaking to pay royalty as per prevailing rate during the time of execution (Annexure-E), (v) GST Registration Certificate, (vi) PAN Card, (vii) EPF registration certificate, (viii) Valid OCC Ltd**

enlistment certificate and all other required documents as per the relevant clauses of DTCN and ITB should be uploaded in web-site www.tendersodisha.gov.in at the time of submission of Bid.

28. **The successful L-1 bidder has to submit the original documents as cited above from Sl.No (i) to Sl.No. (iv) under clause no. 7 of NIT & clause No.27 of DTCN along with other necessary documents before acceptance of the tender.**

29. The tender containing extraneous condition not covered by the tender call notice are liable for rejection and tender should be strictly in accordance with the tender call notice, any change in the wording will not be accepted.

30. It is allowed to modify the bid through the e-procurement portal. The bidder shall have to log on to the system and resubmit the documents as asked for by the system including the price bid. In doing so, the bids already submitted by the bidder will be removed automatically from the system and the latest bid only will be admitted. But the bidder should avoid modification of bid at the last moment to avoid system failure or malfunction of internet or internet congestion. If the bidder fails to submit his modified bids within the designated time of receipt, the bids already in the system shall be considered for evaluation. Withdrawal of bid is also allowed in the e-procurement portal. The bidder has to click on the "withdraw" button and record the necessary justification for the same in the space provided. In addition to this, he has to write a letter addressed to the Officer inviting the bid and up load the scanned document to portal in respective bid. The system shall not allow any withdrawal after expiry of the closure time of the bid.

31. Items of work not covered in the BOQ shall be paid at the mutually agreed rate within the current schedule of rates of the state and those not covered by the said schedule rates will be paid, on actual analysis approved by the competent authorities.

32. On no account the contract work should be sublet to any contractor. In such an event the contract may be rescinded with penalty as will be deemed proper as per decision of the competent authority.

33. Letter etc, raising and lowering the rates or dealing with any point in connection with the tender will not be considered.

34. Schedule of Quantity accompanies tender notice:- It shall be definitely understood that the Corporation does not accept any responsibility for the correctness and completeness of this schedule and this schedule is liable for alternations or omissions, deductions or additions as set

forth in the condition of contract and such omission, deductions additions or alternations shall in no way invalidate the contract and no extra monetary compensation will be entertained.

35. The authority reserves the right to make such increase or decrease in the quantity of items of works mentioned in the schedule attached to the tender notice as may be considered necessary for the satisfactory completion of the work. All such increase or decrease shall in no way invalidate the rates. The Contractor shall not be entitled for any compensation on this account, except extension of time where considered necessary.

36. All taxes, such as income tax, labour cess, fees, royalties payable under the local rule excluding GST as applicable will be borne by the Contractor. GST will be paid to the contractor as per the prevailing rates.

37. The Earnest Money Deposit submitted during participation of tender will be retained in the case of successful tender and will be dealt with as per the terms and conditions of the O.P.W.D. code and will not carry any interest. The earnest money of the unsuccessful tender will be automatically refunded through on-line process.

38. The work may be splitted up and distributed among several Contractors if considered necessary on the emergency of the circumstances of the work and the Contractor is not entitled to any compensation on this account.

39. The Corporation reserves the right of authority to reject any or all tenders received without assigning any reason, thereof.

40. The tender inviting officer is not responsible for any failure, malfunction of breakdown of the electronic system used during the e-procurement process.

41. That for the purpose of jurisdiction in the event of any dispute if any the contract would be deemed to have been entered in to within the State of Odisha and it is agreed that neither party to the contract will be competent to bring a suit in regard to the matter by this contract at any place outside the State of Odisha.

42. The tenderer whose tender is selected for acceptance shall within a period of fifteen days of issue of Letter of Acceptance shall make an **Initial Security Deposit** in the form of Demand Draft/Term Deposit Receipt of any nationalized or schedule Bank. The TDR shall be duly pledged in favour of the Odisha Construction Corporation Limited and it shall be **2%** of the tendered amount including the EMD amount already deposited and sign the agreement in the required

P.W.D. form for the fulfillment of the contract in the concerned project office of OCC Ltd or as directed. Submission of Bids through the e-Procurement Portal **www.tendersodisha.gov.in**, the system shall generate the award of Contract letter and intimate the bidders in their e-mail. Failure to enter in to the required agreement and to deposit the ISD as above shall entail forfeiture of the EMD. No tender shall be finally accepted until the required amount of ISD is deposited. The agreement to be entered in between the Contractor and the OCC Ltd shall be the foundation of the rights of both the Contractor and the OCC Ltd and the contract shall be deemed to be incomplete until the agreement has first been signed by the Contractor and then by the authorized Officer of the Odisha Construction Corporation Limited. The security deposits deducted from the bills will be refunded one year after satisfactory completion of the work and payment of the final bill whichever is later subject to the condition that no defect is noticed in the work and will not carry any interest.

43. Under section 12 of contract labour (Regulation and Abolition Act 1970) the Contractor who undertakes execution of work, should produce valid Labour License from Labour Department before commencement of the work.

44. The Contractor shall be liable to fully indemnify the OCC Ltd under workmen compensation Act VIII of 1993 on account of the workmen employed by the Contractor and full amount of compensation paid will be recovered from the Contractor.

45. Tenderers are required to abide by the minimum wages Act as introduced by Govt. of Odisha and will not pay less than the minimum wages fixed by Govt., to the labours engaged by him for the work.

46. In case of any complaint by the labourers working about the nonpayment of wages as per prevailing minimum wages Act, the Senior Manager (Civil) will have the right to investigate and if the Contractor is found to be at fault, the Senior Manager (Civil) may recover such amount from the Contractor's dues and pay such amount to the labourers directly under intimation to the local Labour Office of the Govt. The decision of the Senior Manager (Civil) is final and binding on the Contractor.

47. The Contractor will have to submit the monthly return of labourers of all categories employed by him on the work to the District Labour Officer & the Senior Manager (Civil) in charge of the work.

48. The Contractor should keep himself in touch with the Engineer-in-charge for smooth execution of the work and arrange adequate labourers depending on the workload and working space available. No claim for idle labour on any account will be entertained.

49. No compensation will be paid by the OCC Ltd for any damage done by rain, flood, cyclone, tide or by any other natural calamities during the execution of the work.

50. No claim what-so-ever will be entertained in regard to extra items of work or extra quantity of any item besides agreement quantity and amount, unless written order is obtained from the Engineer-in-charge and rates settled before the extra items of work or extra quantity of any item of work is taken up.

51. The tenderers shall have to abide by the C.P.W.D. safety code rules introduced by the Govt. of India, Ministry of Works Housing and Supply in their standing order No.44150 dt.25.01.1957, which can be seen in the Office of the Senior Manager (Civil) in charge of the office on working day, during office hours.

52. The tenderers shall bear various incidentals sundries and contingencies necessary for the work in full within the following /similar category.

53. (a) Rent, Royalties and other charges of materials etc, all other taxes excluding GST as applicable, conveyance charges and other cost on account of land and building & temporary electric connection to worksite. Maintenance of coffer dam, service road, diversion road till completion of work required by the tenderer for collection of materials, storage, housing of staff or other purpose of the work. No tenderer will however be liable to pay for temporary occupation of land owned by Govt. at the site of the work.

(b) Labour camps or hutments necessary to a suitable scale including sanitary arrangements up to the satisfaction of the local health authorities.

(c) Suitable water supply for the staff and labour engaged inthe work.

(d) Fees and duties levied by the canal or water supply authorities.

(e) Suitable equipment and wearing apparatus for the labour engaged in risky operations and medical aid to the labourer engaged for the work.

(f) Suitable fencing, barriers, signals including paraffin and electric signals where necessary at work and approaches in order to protect public and employees from accident.

(g) Compensation including cost of any suit for injury to persons or property due to negligence of any precautions also becomes payable under workmen compensation Act.

(h) The Contractor has to arrange adequate lighting arrangement for the work wherever necessary at his own cost.

54. All preliminary works such as survey, site clearance, vats, mixing platforms etc. are to be done by the Contractor at his own cost. No payment will be made for bench marks. Level pillars, profiles,

benching and leveling the ground wherever required. The percentage rates to be quoted should be for finished items of work inclusive of carriage of all materials and incidental items of works.

55. After the work is completed, all surplus materials & debris should be removed clear away from the site of the work as directed by the Engineer-in-charge. Preliminary work such as vats, mixing platforms etc. should be dismantled and all materials removed from the site and premises left neat and clean and this should be inclusive of the rates.

56. If any further information is required, Senior Manager (Civil) in charge of the work will furnish the same.

57. In case of delay in acquisition of land no compensation will be admissible but extension of time will be allowed.

58. The OCC Ltd will have the right to supply at any time in the interest of the work any departmental materials to be used in the work and the Contractor shall use such materials at the stock issue rate by the OCC Ltd or market rate whichever is higher.

59. Over and above these conditions including the Technical specifications of the items, conditions, rules and regulations, specification laid down in relevant IS codes are also binding on the part of the Contractor.

60. For submission of bids through e-Procurement Portal **www.tendersodisha.gov.in**, the bidder shall upload the scanned copy/copies of valid OCC Ltd enlistment certificate, PAN card, GST No, Affidavit regarding authenticity, genuineness of documents & 'No relationship' certificate in prescribed proforma. If the bidder has not registered their GST in the State of odisha, they have to get themselves registered under GST in the Govt. of Odisha before drawal of agreement.

61. No Relation Certificate.

The Contractor shall have to furnish certificate along with the tender to the effect that they are not related to any officer of Govt. of Odisha/OCCL in the rank to an Asst. Executive Engineer and above and any officer of the rank of Under Secy. and above in the W.R. Department. If the fact subsequently proved to be false, the contract will be rescinded. The earnest money and the total security will be forfeited and shall be liable to make good the loss or damage, resulting from such cancellation. **(The proforma for no relation certificate is contained in a separate sheet of I.T.B. in Annexure-B)**.

62. The Contractor shall submit signed documents of final acceptance of the plans, sections and agreements for the work prior to take up the work for execution.

63. The Contractor is to supply necessary labour and materials for the purpose of layout during alignment fixing whenever required at his own cost.

64. The Contractor should arrange necessary tools and plants as may be required for the efficient execution of work at their own cost. The running charges of such plant and cost of consumables and conveyance are to be borne by the Contractor.

65. In the event of delay in supply of approved drawings reasonable extension of time will be granted on the application of the Contractor. But no claim for monetary compensation will be entertained under any circumstance.

66. Under no circumstance, Interest chargeable for the dues or any additional dues if any payable for the work.

67. Conditional tenders will not be taken into consideration.

68. The EMD will be forfeited, if the tenderer backs out from offer before acceptance of the tender by the competent authority as concurred in by Law Dept & Finance Dept. in their UOR No. 848/L dt. 31.5.97 & UOR No. 202/WFD dt. 6.3.98 respectively (Works Dept. Memo No. 9101/Clt, dtd. 30.3.98) also the EMD will be forfeited if the tenderer fails to sign the agreement after acceptance and not willing to deposit the required ISD and Additional Performance Security, if any for the unbalance tender amount.

69. If L1 bidder does not turn up for agreement after finalization of the tender, then they shall be debarred from participation in bidding for any other tender for three years and action will be taken to blacklist the Contractor. In that case, the L2 bidder, if fulfils other required criteria would be called for drawing agreement for execution of work subject to the condition that L2 bidder negotiates at par with the rate quoted by the L1 bidder otherwise the tender will be cancelled. In case a Contractor is black listed, it will be widely published and intimated to all departments of Govt. and also to Govt. of India agencies working in the State.

70. When in response to a notice calling for tenders, only a single tender is received in the first time, the tender shall be cancelled without opening of the bid and fresh tender be invited publicly. If single tender is received even after retendering, then the approval of the next higher authority should be obtained, if the tender is otherwise in order and acceptable.

71. Protection against flood: The Contractor shall make his own arrangement at his cost to shift the machineries, equipment's, materials, labourer and departmental machineries if hired by the Contractor to a safe place prior to flood. The work shall have to be resumed after the work site is normal after flood. No extension of time for the completion of the work may be considered by the

Department/Corporation if the discontinuance of the work is beyond the reasonable attempts of the Contractor to such eventualities.

72. The debris, sand and other materials, accumulated in the work area during flood shall be removed by the Contractor as required for continuing the work at their own cost. By any chance, if any excavated portion that could not be filled up with concrete by the Contractor, gets filled up during the monsoon period with earth, such removal will not be paid again. The Contractor will have to re-excavate the same at their own cost.

It shall be distinctly understood that, it is entirely the responsibility of the Contractor to make such arrangements may be required from time to time to protect the men, machinery, materials and the work under progress and work for which the measurements were recorded and payment made, against any damages either during working season or during the flood. The department accepts no liability, what so ever for any damage or loss of men, materials, machinery and type of hindrance caused to the progress of work.

The Contractor should provide at his own cost adequate protection measures to the completed works at the end of working season or work in progress against such eventuality till completion and handing over the entire work to the Department/OCCL.

73. Dewatering from the foundation for dams, spillways, bridges, culverts, retaining walls, canal/drain bed lining, building work sites etc. and watering for consolidation in roads embankments wherever necessary during execution will have to be done by the Contractor and no extra payment will be made on that account. The terms dewatering shall mean the execution or operation of the items due to standing water as well as due to percolation water.

74. Income Tax as applicable over the gross amount of the bill is to be deducted from the Contractors bill towards income tax & as amended from time to time.

75. (a) The bidders have to quote the **percentage rate** excluding GST (Goods and Service Tax).

(b) The **percentage rate** quoted by the Contractor in the tender for works shall exclude GST that may be levied on turnover on works contract according to the Laws and Regulations as applicable & as amended from time to time.

(c) GST as applicable on works contract will be deposited by the Contractor after passing of each bill and the Contractor is to intimate to the Corporation subsequently.

(d) TDS on works contract as applicable towards GST will be deducted from the bill and credited to Govt. account by the Corporation.

(e) **1% (One Percent)** of the gross amount of the bill will be deducted from the Contractor bill towards labour Cess as per Odisha building and other construction workers (RE & CS) rules 2002 and Amendment during 2008 and as amended by Govt. from time to time.

76. The amount of royalty of different materials as utilized by the Contractor in the work will be recovered from their bill, basing on the rate fixed by the Govt. or as amended from time to time during the period of execution.

77. **Additional Performance Security** shall be obtained from the bidder when the bid amount is less than the estimated cost put to tender. In such an event, only the successful bidder who has quoted less bid price/rates than the estimated cost put to tender shall have to furnish exact amount of differential cost i.e. estimated cost put to tender minus the quoted amount as Additional Performance Security (APS) in shape of **Term Deposit Receipt** pledged in favour of Odisha Construction Corporation Limited/ **Bank Guarantee (Annexure-D)** in favour of Odisha Construction Corporation Limited from any nationalized/scheduled bank in India counter guaranteed by its local branch at Bhubaneswar within seven days of issue of Letter of Acceptance (LoA) by Odisha Construction Corporation Limited (by email) to the successful bidder otherwise the bid of the successful bidder shall be rejected and the Earnest Money Deposit/Bid Security shall be forfeited. Further proceeding for blacklisting shall be initiated against the bidder.

78. The bidder may be asked in email/letters to clarify on the uploaded documents provided in the Technical Bid if necessary, with respect to any doubts or illegible documents. The authority inviting bid reserves the right to accept any additional required document for clarification on uploaded documents.

79. The Contractors would be responsible for procurement of materials confirming to the required specification from authorized sources and voluntarily disclose the source of procurement. Besides the bidder would be required to submit the details of quarry for procurement while submitting the bills.

80. Miscellaneous:

(a) The Corporation will have the right to inspect the scaffolding and centering made for the work and reject partly or fully such structures if found defective in the opinion of the Engineer-in-charge.

(b) Shuttering and centering shall be made with steel material the inside of which shall be lined with suitable sheeting and make leak proof and water tight and to obtain a good finished surface as per the item specified in the BoQ as well as to get a good aesthetic view of the exposed concrete surface.

81. Tenderers are also required to go through each clause of P.W.D. form P1 carefully in addition to the clause mentioned herein before tendering.

82. All the forms and Annexure 'A' to 'C' & 'E' attached to section 2 of this ITB must be filled in properly along with the authenticated documentary evidence required therein.

83. If a Contractor removes any Govt. material or stores supplied to him from the site of the work in contraception of the provision of this clause with a view to dispose of the same dishonestly, they shall be in addition to any other liability civil or criminal arising out of this contract be liable to pay penalty equivalent to 5 (five) times of the price of the materials cost. The penalty so imposed shall be recoverable at any time from the sum that may be due then or at any time thereafter become due to the Contractor or from their security deposit or from their other available dues with the Department / OCCL.

84. **GENERAL INSTRUCTION TO CONTRACTORS as per DoWR letter No.20415 dt.14.09.2015.**

(i) Any agency or Contractor executing a work should be aware about the local festivals like Makar Sankranti, Raja Sankranti, Chaiti Parab, Danda Nata or any such festivals which may effect the work schedule. Therefore, the Contractor should engage more work forces during working period available at their disposal to complete the work as per schedule.

(ii) In the peak summer season, working hour is curtailed by the Labour Department to avoid exposure to personnel to the scorching sun and heat. It is the duty of the agency to increase the number of work force and to employ the existing work force during morning and afternoon hours as per Government orders.

(iii) Rainfall is a normal occurrence during monsoon in Odisha. So, unless there is unusually heavy rainfall resulting in a declared calamity, the Contractor is not eligible for any extension of time. The Contractor should plan the deployment of workforce and machinery, so as to complete the work as per schedule considering ordinary vagaries of nature. The same applies for borrow area ponding also. The Contractor should foresee possible ponding of borrow area in monsoon and likewise lift more quantity of soil/ other materials during dry period, so as to complete the work as per schedule.

(iv) The Contractor should take up the work with due diligence in the acquired land without waiting for acquisition of entire land. This should be completed in proportionally less period depending on the quantum of available work front.

(v) The Agency should plan his work programme and mobilize men and machineries considering the canal closure programme of a particular system or area. Khariff / Rabi closure can't be imposed arbitrarily on the farmers as per the convenience of the agency. Closure of canal for the interest of work will be solely at the discretion of the Engineer-in- charge and can't be claimed as a matter of right.

(vi) There will be always be standing crop before harvesting season as per crop schedule and this fact has to be clearly understood by the agency. Extension of time on this ground may not be considered by the Division officer.

(vii) Only the day(s) of elections to the Local Bodies / Assembly / Parliament will be treated as non working day(s)

85. **Definitions**

In the contract (as hereinafter defined) the following words and expressing will have the meanings here by assigned to them.

a) Approved / Approval – Means approved / approval in writing.

b) Construction Plant – Means all equipments, appliances or a thing of whatsoever nature required for the execution, or completion, maintenance of the works or temporary works but does not include materials or other things intended to form or forming part of the permanent work.

c) Contract – Means the instruction and information for tenderers General and Special conditions of the contract, Technical specification, drawings, tender (including the schedule of quantities and tender prices) the formal agreement and all agenda and attachment related to the above.

d) Contractor – Means the particular person, firm or corporation with whom the contract has been made for executing the work.

e) Drawing – Means the drawing referred to in the specifications any modifications of such drawings approved in writing by the Senior Manager (Civil) in charge of the work and such other drawings are may from time to time be furnished or approved in writing by the Engineer-in-charge.

f) Engineer-in-charge – Means the Senior Manager (Civil) -in-charge of the work specified or parts of the works under the contract or such other OCC Ltd. assistants of sub-ordinates to whom the Senior Manager (Civil), may have delegated certain duties acting separately within the scope of particular duties entrusted to them.

g) Government – Means Government of Odisha, Department of Water Resources.

h) I.S.S./ B.I.S – Means Indian Standard Specification/ Bureau of Indian Standard.

i) Temporary Works – Means all temporary works of every kind required for the performance of the contract.

j) Specification – Whenever the term Specification is used, apart from a specified standard specification, it shall mean the specification or plan prepared for a particular site as instructed to the Contractor in executing that item of work.

86. **Procedure for Electronic receipt, accounting and reporting of Cost of Tender Paper and Earnest Money Deposit on submission of bids. (Vide Works Department O.M.No. 6785 /W. Dtd. 09.05.2017)**

i. The State Government have formulated rules and procedures for Electronic receipt, accounting and reporting of the receipt- of Cost of Tender Paper and Earnest Money Deposit on submission of bids through the e-procurement portal of Government of Odisha i.e. "https://tendersodisha.gov.in".

ii. Electronic receipt of cost of tender paper has been successfully tested through SBI payment gateway. Now it has been decided to introduce electronic receipt of Cost of Tender Paper and Earnest Money Deposit on submission of bids through payment gateway of designated banks such as SBI/ICICI Bank/HDFC Bank for all Government Departments, State PSUs. Statutory Corporations, Autonomous Bodies and Local Bodies etc. in phases (Annexure-1). The process outline as well as accounting and reporting structure are indicated below :

a) It will be carried out through a single banking transaction by the bidder for multiple payments like Cost of Tender Paper and Earnest Money Deposit on submission of bids.

b) Various payment modes like Internet banking/ NEFT/RTGS of Designated Banks and their Aggregator Banks as well can be accessed by the intending bidders.

c) Reporting and accounting of the e-receipts will be made from a single source.

d) Credit of receipts into the Government accounts and to the designated Bank account of the participating entities indicated in Para ii above would be faster.

iii. Only those bidders who successfully remit their Cost of Tender Paper and Earnest Money Deposit on submission of bids would be eligible to participate in the tender/bid process. The bidders with pending or failure payment status shall not be able to submit their bid. Tender inviting authority,

State Procurement Cell, NIC, the designated Banks shall not be held responsible for such pendency or failure.

iv. Banking arrangement:

a) Designated Banks (SBI/ICICI Bank/HDFC Bank) payment gateway are being integrated with e-Procurement portal of Government of Odisha (https://tendersodisha.gov.in)

b) The Designated Banks participating in Electronic receipt, accounting and reporting of Cost of Tender Paper and Earnest Money Deposit on submission of bids will nominate a Focal Point Branch called e-FPB, who is authorized to collect and collate all e-Receipts. Each such branch will act as the Receiving branch and Focal Point Branch notwithstanding the fact that the bidder might have debited his account in any of the bank's branches while making payment.

v. Procedures of bid submission using electronic payment of tender paper cost and EMD by bidder:
a) Log on to e-Procurement Portal: The bidders have to log onto the Odisha e-Procurement portal (https://tendersodisha.gov.in) using his/her digital signature certificate and then search and then select the required active tender from the "Search Active Tender" option. Now. submit button can be clicked against the selected tender so that it comes to the "My Tenders" section.

b) Uploading of Prequalification/Technical/Financial bid: The bidders have to upload the required Prequalification /Technical/Financial bid, as mentioned in the bidding document and in line with Works Department office memorandum no.7885, dt.23.07.2013

Electronic payment of tender paper cost and EMD:

Then the bidders have to select and submit the bank name as available in the payment options

i. A bidder shall make electronic payment using his/her internet banking enabled account with designated Banks or their aggregator banks.
ii. A bidder having account in other Banks can make payment using NEFT/RTGS facility of designated Banks. · Online NEFT/RTGS payment using internet banking of the bank in which the bidder holds his account, by adding the account number as mentioned in the challan as an interbank beneficiary.

Bid submission:

Only after receipt of intimation at the e-Procurement portal regarding successful transaction by bidder the system will activate the 'Freeze Bid Submission' button to conclude the bid submission process.

System generated acknowledgement receipt for successful bid submission:

System will generate an acknowledgement receipt for successful bid submission. The bidder should make a note of 'Bid ID' generated in the acknowledgement receipt for tracking their bid status.

Settlement of Cost of Tender Paper;

a) Cost of Tender Paper: In respect of Government receipts on account of Cost of Tender Paper, the e-Procurement portal shall generate a MIS for the State Procurement Cell (SPC). The MIS will contain an abstract of the cost of tender paper collected with reference to Bid Identification Number. The State Procurement Cell shall generate Bank-wise-head-wise challans separately for Cost of Tender Paper and instruct the designated Banks to remit the money to the State

Government account under different heads. In respect of the cost of tender paper received through the e-procurement portal, the remittance to the Cyber Treasury account will be made to the Head of Account 0075-Misc, General Services-800-Other Receipts 0097-Misc. Receipts-02237-Cost of Tender Paper.

b) For the time being, the State Procurement Cell (SPC) will use over the counter payment facility of the Odisha Treasury portal. Thereafter, remittance through NEFT & RTGS will be facilitated through the Odisha Treasury portal.

c) Similarly, in case of State PSUs, Statutory Corporations, Autonomous Bodies and Local Bodies etc., Cost of Tender Paper, the e-Procurement portal shall generate a MIS for the State Procurement Cell (SPC). The MIS will contain an abstract of the cost of tender paper collected with reference to Bid Identification Number. The State Procurement Cell shall generate Bank-wise list of challans and instruct the designated Banks to remit the money through the Odisha Treasury portal. The cost of tender papers will be credited to the registered Bank account of the concerned State PSUs, Statutory Corporations, Autonomous Bodies and Local Bodies etc.

d) Bank will refund (in case the Tender Inviting Authority (TIA) issues such instructions) the tender fee, EMD to the bidder, in case the tender is cancelled before opening of Bid as per direction received from TIA through e-procurement system.

e) Back-end Transaction Matrix of Electronic receipt of Cost of Tender Paper and Earnest Money Deposit on submission of bids is enclosed in the Annexure. 1. Settlement of Earnest Money Deposit on submission of bids: a) The Bank will remit the Earnest Money Deposit on submission/cancellation of bids to respective bidders accounts as per direction received from TIA through e-procurement system.

Forfeiture of EMD :

Forfeiture of Earnest Money Deposit on submission of bid of defaulting bidder is occasioned for various reasons as follows.

a) In case the Earnest Money Deposit on submission of bid is forfeited, the e-Procurement portal will direct the Bank to transfer the EMD value from the Pooling Account of SPC to the registered account of the tender inviting authority.

b) The Tender inviting authorities of the Government Departments will deposit the forfeited Earnest Money Deposit on submission of bid, in the State Government Treasury under the appropriate head (8782-Cash Remittances and Adjustments between the officers rendering accounts to the same Accounts Officer-102P.W.Remittances-1683-Remittances-91028-Remittances into Treasury) after taking the amount as a revenue receipt in their Cash Book under the head 0075-Misc. General Services-00-101 -Unclaimed Deposits-0097Misc, Receipts-02080-Misc. Deposits and submit the detail account to DAG (Puri) as a deposit of the Division.

c) By clicking submit button, system will initiate the forfeiture of EMD. System will not allow the evaluator to edit the initiation after clicking the submit button. Forfeiture option can be carried out in phased manner like one bidder at a time.

Role of the Banks:

a) Make necessary provision / customizations at their end to enable the provision for online payments / refunds as per this document.

b) Provide necessary real-time message to bidders regarding successful or unsuccessful transactions during online payment processes and redirect them to e-Procurement website with necessary transaction reference details enabling them to submit their bids.

c) The bank shall ensure transfer of funds from the pooling account to the Government Head/current account of PSUs/ULBs within the next bank working day as per the directions generated from e-Procurement portal.

d) Bank should provide timely reports and reference details to NIC enabling them to carry out their role as stated below.

e) Refund of amount to bidders as per the XML file provided by e-Procurement system on the next bank working day from the date of generation of the XML file and also provide a confirmation to NIC on the same.

Role of State Procurement Cell:

a) Communicate requirements of Government departments/ State PSUs/ Autonomous Bodies/ ULBs online payment requirements to National Informatics Centre / the authorised Banks for mapping/ customization.

b) In every working day, the State Procurement Cell shall generate MIS from the e-Procurement portal to ascertain the tender paper cost received in the e-Tendering process separately bank-wise for the Government Department and the PSUs/ULBs. The SPC shall generate bank-wise separate online challans from the Odisha Treasury portal and make the remittance through over the counter facility or NEFT/RTGS (as and when this functionality is available in Treasury portal) and issue instruction to the bank for remittance of the receipt to the State Government account.

c) The State Procurement Cell shall be responsible for providing challan details and MIS in respect of the remittance towards tender paper cost to the Tender inviting authorities for their record.

d) State Procurement Cell shall monitor the progress of e-Tendering by different Government departments / State PSUs/ Autonomous Bodies / ULBs through an MIS. State Procurement Cell shall monitor and send monthly progress reports to the Government.

e) The e-Procurement system will generate a consolidated refund & settlement XML file as an end of the day activity.

f) e-procurement system will provide a web service for payment gateway (PG) provider to pull the encrypted refund and settlement details in XML file against a day.

g) Similarly, payment gateway (PG) provider will provide a web service to pull the refund and settlement status against a day

h) e-procurement system will update the status accordingly for reconciliation report.

Role of National Informatics Centre:

a) Customize e-Procurement software and web-pages of Government of Odisha (https://tendersodisha.qov.in) to enable the provision for electronic payment.

b) The NIC, Odisha will modify / rectify the errors in electronic data relating to the Chart of Account.

c) NIC will provide an interface to organisations to download the electronic receipt data.

d) Enable automatic generation of daily XML files from e-Procurement system and ensure delivery of the same to the authorised Banks for enabling automatic refund/settlement of funds.

e) NIC shall enable the e-Procurement portal to generate MIS as required for the State Procurement Cell in order to make remittance of the tender paper cost to the State Government account using the Odisha Treasury portal.

Role of Cyber Treasury :

a) The cost of the tender paper deposited by the SPC using the Odisha Treasury Portal which will be accounted for by the Cyber Treasury and it shall submit the accounts to A.G (O) as per the established process.

b) The Cyber Treasury will provide MIS as required to the SPC for the purpose of accounting and reconciliation of the electronic remittances made to the State Government account.

Redressal of Public grievances :

The State Procurement Cell, Odisha, National Informatics Centre, Odisha and the e-FPB will have an effective procedure for dealing with, public complaint for e-Receipt related matters. In case, any mistake is detected by any of the stakeholders in reporting of receipt of tender paper cost and EMD, either suomoto or on being brought to its notice, the State Procurement Cell, Odisha, National Informatics Centre, Odisha unit, Cyber Treasury and the bank will promptly take steps for rectification. The e-Focal Point Branch of the participating Banks, National Informatics Centre, Odisha and the State Procurement Cell, Odisha will notify the contact number and address of the Help Desk for resolution of any dispute regarding e-Receipt.

Applicability and modification of existing rules / orders:

The modalities prescribed in this Office Memorandum for downloading of tender paper, submission and rejection of bid, acceptance of Bids as well as refund and forfeiture of earnest deposit will be applicable for electronic submission of bids through e-procurement portal. Existing provisions regulating cost of tender paper, earnest money deposit in OPWD Code and OGFR would stand modified to the extent prescribed. 15. These arrangements would be made effective after signing of MoU between the designated Banks and the State Procurement Cell, firming up of Banking arrangements and technical integration between designated Bank and e-Procurement Portal.

ANNEXURE-1

Back-end Transaction Matrix of Electronic receipt and remittance of Cost of Tender Paper and Earnest Money Deposit on submission of bids.

	Cost of Tender Paper on submission of bids	Earnest Money Deposit on submission of bids
Government Departments	I. The payment towards the cost of Tender Paper, in case Government Departments, shall be collected in separate Pooling accounts opened in Focal Point Branch called e-FPB of respective designated banks [as stated in Para 2] at Bhubaneswar on T+1_day. II. With reference to the Notice Inviting Tender/ Bid Identification Number, the amount so realized is to be remitted to Government Account under the Head Of Account 0075-Misc. General Services-800-Other Receipts-0097Misc. Receipts-02237-Cost of Tender Paper through Odisha Treasury Portal after opening of the bid.	I. In case of tenders of Government Departments, amount towards Earnest Money Deposit on submission of bids shall be collected in a pooling account opened for this purpose at Focal Point Branch called e-FPB of respective designated banks at Bhubaneswar and the banks will remit the amount to respective bidder's account within two working days on receipt of instruction from TIA through refund and settlement of e-procurement system. II. In case of forfeiture of Earnest Money Deposit on submission of bids, the e-Procurement portal will direct the Bank to transfer the EMD value from the Pooling Account of SPC to the registered account of the tender inviting authority within two working days of receipt of instruction from TIA.
State PSUs Statutory Corporations, Autonomous Bodies and Local Bodies.	I. In case of State PSUs, Statutory corporations, Autonomous Bodies and Local Bodies etc. the amount towards Cost of Tender Paper, on submission of bids shall be collected in separated pooling accounts opened in Focal Point Branch called e-FPB of respective designated Banks at Bhubaneswar on T+1 days. II. The Paper cost will be transferred to the respective current accounts of concerned State PSUs, Statutory Corporation, Autonomous Bodies and Local Bodies etc. after opening of bid.	Statutory Corporations, Autonomous Bodies and Local Bodies. I. Amount towards EMD on submission of bids shall be collected in a separate pooling account of Focal Point Branch called e-FPB of respective designated banks at Bhubaneswar and the banks will remit the amount to respective bidder's account on receipt of instruction from TIA through refund and settlement of e-procurement system within two working days from receipt of such instruction. II. In case of forfeiture of Earnest Money deposit on submission of bids, the e-Procurement portal will direct the Bank to transfer the EMD value from the Pooling Account of SPC to the registered account of the tender inviting authority within two working days of receipt of instruction from TIA.

SECTION-II

INSTRUCTION TO BIDDERS

INSTRUCTIONS TO BIDDERS

1 **Preparation of Tender Documents.**

The intending tenderer shall login to the e-procurement portal identified as https://www.tendersodisha.gov.in and download the Technical Bid (Cover-I) and Financial bid (Cover-II) in shape of bill of quantity in an intelligent MS Excel Format. As per the requirement of the bid document, the bidder will fill up required information and **the Percentage excess / less** at required cell on the intelligent MS Excel sheet. The bidder is to scan his PAN card, Affidavit in prescribed proforma duly registered before NOTARY, No relation certificate in prescribed proforma, GST Registration Certificate, EPF Registration Certificate and certificate issued by competent authorities required for fulfilling the minimum qualifying criteria specified in the bid document for the work. The bidder should also upload C-I enlistment Certificate of OCCL as specified in NIT & DTCN.

2. **Method of submission of Tender Documents**.

2.1 **The bidder shall upload the scanned copy/ copies of the documents & information as per requirement of the bid document through the e-procurement portal. All documents & scanned copies are to be uploaded in the designated location of the Technical Bid (Cover-I) except the filled up intelligent MS Excel Sheet. The filled up Bill of Quantities in Intelligent Excel Format will be uploaded in the designated location of Price Bid (Cover-II). The Bidder is required to upload the required documents in appropriate location of the Technical & Financial Bid failing which the Bid will be rejected**.

All the uploaded documents should be clear & legible. Before activating the submit button the clarity of the document may be ensured by taking out a sample copy. In the e-procurement tendering system, the bidder is required only to submit the required information as per Bid document instead of submitting the entire Technical Bid document. The online bidders shall digitally sign on the all statements, documents, clarification uploaded by them owning responsibility for their correctness /authenticity. If any of the information furnished by the bidder is found to be false/ fabricated/ bogus the bidder will be black listed & EMD / Bid Security will be forfeited.

(A) Technical Bid (Cover-I) shall contain :

(i) Copy of electronic transaction for cost of Bid documents and EMD
(ii) Affidavit duly registered before NOTARY regarding authenticity of documents (Annexure-A)
(iii) No Relation Certificate (Annexure-B),
(iv) Undertaking to pay minimum wages (Annexure-C),
(v) Undertaking to pay royalty as per prevailing rate during the time of execution (Annexure-E),
(vi) GST Registration Certificate,
(vii) PAN Card,
(viii) EPF registration certificate,
(ix) Valid OCC Ltd enlistment Certificate or certificate of Registration of concerned State Government/ Railway/ CPWD/ Government bodies along with copy of the application for C-I enlistment in OCCL.
(x) Documents in support of minimum qualifying criteria as stipulated in ITB, Section-II.

Any other documents except Bill of Quantities in Intelligent MS Excel Format as per NIT/ DTCN & ITB.

(B) Financial Bid (Cover-II) shall contain :

Bill of Quantities in Intelligent MS Excel Format.

2.2 The information required as per bid documents may be provided in the specified format annexed to the bid document.

2.3 If the intending tenderer is an individual, the documents shall be signed by the individual above his full type written name and current address.

2.4 If the intending tenderer is a proprietary firm, it shall be signed by the proprietor above his full name and with his current address.

2.5 If the intending tenderer is a firm in partnership, it shall be signed by a partner holding the power of attorney for the firm in partnership in which case a certified copy of power of attorney shall accompany in the pre-qualification documents.

2.6 If the intending tenderer is a limited company or Corporation, it shall be signed by a duly authorized person holding the power of attorney in which case certified copy of power of attorney shall accompany.

2.7 All witness and sureties shall be of person of status and probity and their full names, occupation and address shall be stated below their signatures.

2.8 **DELETED**

3. <u>Opening of Technical Bid Document</u>.

The tender documents will be opened on dated **26.02.2021 at 12.00 Noon** in the Corporate office of Odisha Construction Corporation Limited, at Gopabandhu Nagar, Unit-VIII, Bhubaneswar in the presence of tenderers or their authorized representative, who wish to be present.

4. Minimum Qualifying Criteria

(A) **<u>SATISFACTORY COMPLETION OF SIMILAR MAJOR ITEMS OF WORK</u>**

To qualify for award of the contract, the bidder should have executed the following minimum quantities in any one financial year during the last 5 years i.e. **from FY 2015-16 to FY 2019-20** and including current financial year i.e. FY **2020-21**

<u>Qualifying Quantity</u>

1.	Earth Work	=	**96763 Cum**
2.	Earthwork by dredging	=	**132449 Cum**

i. The quantity means the sum total of similar items in all the works executed in one FY.

ii. These items might have been executed in different years separately, in last 5 years including the FY of invitation of tender.

The bidder should submit self-attested copy of certificate of authenticity in the enclosed bidding documents from the concerned Executive Engineer/competent Officer-in-charge of execution regarding execution of major items of works during last 5 years. Last 5 years means: 5 years prior to the financial year of invitation of Tender and current financial year.

B. **<u>BID CAPACITY</u>**

Bidders will be qualified only if their available bid capacity at the time of bidding is more than the total estimated cost of the work **(i.e. Rs. 812.94 lakhs)**. The available bid capacity will be calculated as under: -

Assessed Available Bid Capacity = (A*N*2 - B), where,

A = Maximum value of works executed in any one financial year during the last five years (updated to the current price level). The rate of inflation may be taken as 10 percent per year (escalation factor) which will be taken in to account for the completed works 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 11 months.

N = Number of years prescribed for completion of the works for which the bids are invited (**11/12 years**)

Note: *The statement showing the value of existing commitments and ongoing works as well as stipulated period of completion remaining for each of the works listed should be countersigned by the Engineer-in-Charge not below the rank of Executive Engineer or An Affidavit towards existing commitment clearly stating the value at Current Price Level of the existing commitments and ongoing works must be furnished.*

C. <u>Contractor / Sub-Contractor's experience</u>

Experience Certificate issued by the Executive Engineer to State / central PSUs and Experience Certificates issued by the State / central PSUs to their Sub-Contractor, shall be taken into consideration, while examining the qualifying criteria. The Experience Certificate issued by the State / central PSUs must carry **counter signature of the concerned Engineer-in-Charge not below the rank of Executive Engineer**. In that case, the original State / central PSU and the authorized Sub-Contractor will be treated at par as prime Contractor.

D. **<u>DELETED</u>**

5. Joint Venture is not allowed.

6. Final Decision making authority

The **Managing Director** of the Corporation is the competent authority who reserves the right to accept or reject or disqualify any of the tender without assigning any reasons thereof and his decision shall be final and binding on all the bidders.

7. Further Clarification

The **Managing Director, OCC Ltd,Unit-VIII, Bhubaneswar** may be contacted during office hours on any working days **from 11.02.2021 to 17.02.2021 up to 3.00 P.M** for any further clarification (in writing through Speed Post/e-mail).

8. **Trial Boring:** The level as indicated in the body of the general arrangement drawing is purely tentative and for the DELETED Corporation / Department has no responsibility for the suitabi ndation level. The Contractor has to conduct boring before st cost to ascertain the credibility of the strata at founding level. While quoting his rates for tender the Contractor shall take in to account of the above aspects.

9. ISSUE OF ADDENDA / CORRIGENDA/ CANCELLATION NOTICE:

The Officer inviting the tender may publish any addendum / corrigendum/ cancellation of tender in the notice board and in the web-sites <u>www.tendersodisha.gov.in</u> & <u>www.odishaconstruction.com</u> and such notice shall form part of the bidding documents.

MANAGING DIRECTOR

FORM – A
STRUCTURE AND ORGANISATION

1. Name of Tenderer ……
2. Nationality of Tenderer ……
3. Office Address ……

   ……..
4. Telephone No.

   Land phone ……

   Mobile ……

   Fax No ……

   e-mail id ……
5. Location of establishment ……
6. The tenderer is

a. An individual

b. A proprietary firm

c. A limited company or limited corporation

d . A member of a group of companies (If yes, give names, address and present description of other companies.

e. A subsidiary of large organization

(If yes, give names, address of the present organization)

f. If the company is subsidiary state what involvement if any, will the parent company have in the project.

Attach the organization chart showing the structure of the organization including the names of the Directors position of officer.

7. Number of year of experience

a. As a prime Contractor

   I In own country

   II Other country (specify country)

ANNEXURE-A

(AFFIDAVIT)

(To be submitted in original in legal stamp paper duly registered)

1. The undersigned hereby certifies that, all the statements made in the required attachments are true and correct.

2. The undersigned also hereby certify that, neither our firm _____ nor

   any of its construction partners have abandoned any road/bridge/irrigation/Buildings or other project work in India nor any contract awarded to us for such works have been rescinded during the last five years prior to the date of this bid.

3. The undersigned hereby authorized and request (s) bank, firm or Corporation to furnish pertinent information as deemed necessary and as requested by the Corporation to verify this statement or regarding my (our) competency and general reputation.

4. The undersigned understands and agrees that further qualifying information may be requested and agree to furnish any such information at the request of the Corporation.

(Signed by an Authorized of the firm)

Title of Officer

Name of Firm

Date.

ANNEXURE-B

CERTIFICATE OF NO-RELATIONSHIP

I/We hereby certify that I/We am/are not related to any officer of Govt. of Odisha /OCC Ltd of the rank of Asst. Executive Engineer and above and any officer of the rank of Under Secretary and above in the W.R. Department. I/We am/are aware that if the facts subsequently proved to be false my/our contract will be rescinded with forfeiture of EMD & security deposit and I/We shall be liable to make good the loss or damage resulting from such cancellation.

I/We also note that, non- submission of this certificate will render my/our tender liable for rejection.

Signature of the Contractor

Name _____

Address _____

_____

Date :_____

CONTRACTOR SENIOR MANAGER (CIVIL)

ANNEXURE-C

UNDERTAKING TO PAY MINIMUM WAGES

We do hereby undertake that, we shall pay wages of each labour at the rate not less than the wages as per Minimum Wages Act in force during the time of execution and as may be amended from time to time. The "Engineer-in-Charge" has the right to enquire into and decide on any complaint of the Labourers relating to non-payment or less payment of wages to them and his decision will be final and binding on us.

Signature of the Bidder

Name _____

Address _____

_____

Date :_____

ANNEXURE-D

BANK GUARANTEE FOR ADDITIONAL PERFORMANCE SECURITY (APS)

To

---------- (name of Employer)

WHEREAS the bid of ---------- (name and address of Contractor) (hereinafter called "the Contractor") has been accepted vide letter of acceptance (LoA) No. _____ dated _____ of Odisha Construction Corporation Ltd., ---------- ---------- to execute the work _____ [name of work] (hereinafter called "the contract")

AND WHEREAS it has been stipulated by you for the said Contract that the Contractor shall furnish you with a Bank Guarantee by a Nationalized/Scheduled Bank in India, counter guaranteed by its local branch at Bhubaneswar towards Additional Performance Security (APS), for compliance with his obligations in accordance with the conditions of Contract.

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee.

NOW THEREFORE we hereby affirm that we are the Guarantors and responsible to you, on behalf of the Contractor, up to a total of Rs _____ [amount of guarantee] _____ [in words], such sum being payable in the types and proportions of currencies in which the contract price is payable, and we undertake to pay you upon your first written demand declaring the Contractor to be in default under the contract 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 us with the demand.

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

This guarantee shall be valid up to _____ day of _____ 20 _____ i.e. up to 3 (three) months beyond the date stipulated for completion of work. We also agree for extension of this guarantee for a further period in response to the Employer's written request for such extension, which should be presented to us before the expiry of the guarantee.

We _____ (Name of Bank) hereby also undertake to have it counter guaranteed by our local branch at Bhubaneswar, _____ (name and address of Local Branch at Bhubaneswar, Odisha).

(Signature of the authorized officer of the Bank)

……..

……..

Name and designation of the officer

……..

Seal, name & address of the Bank and address of the Branch

We_____ (name and address of Local Branch at Bhubaneswar, Odisha) are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee depending on the filing of claim and only if it is served upon to us by the employer at our Bhubaneswar Branch by a written claim or demand and received by us at our Bhubaneswar branch on or before Dt. _____(subject to further extension on the Employer's written request for such extension before expiry of this guarantee), otherwise bank shall be discharged of all liabilities under this guarantee thereafter.

(Signature of the authorized officer of the Bank)

……..

……..

Name and designation of the officer

……..

Seal, name & address of the Bank and address of the Branch

ANNEXURE-E

UNDERTAKING TO PAY ROYALTY

We do hereby undertake that, Royalty for stone products, sand, moorum and Borrow earth etc. are to be recovered from work bills as per prevailing Govt. Notification during the time of execution.

Signature of the Bidder

Name _____

Address _____

_____

Date :_____

SECTION-III

SPECIAL CONDITION OF CONTRACT

SPECIAL CONDITIONS OF CONTRACT

1. The contractor is to supply labour for giving section and profiles. All materials necessary for such work will be supplied by the Contractor at his own cost and responsibility and profiles are to be maintained till the work is completed.
2. The offer submitted by the Contractor will remain valid till finalization of the award of the work. He is not entitled to withdraw his offer during the period of consideration of his offer. Withdrawal of offer prior to finalization of the tender will entail forfeiture of EMD.
3. The Contractor shall furnish the postal address of his site office as well as his permanent registered office along with Phone numbers (both Landline & Mobile) and valid e-mail id. Any notice shall be deemed to have been served if it is delivered to his authorized agent/representative at site or sent by Registered Post or sent by e-mail to the said site office.
4. The Contractor shall arrange to obtain drawings and specification of the work from the Senior Manager's Office. He has to carry out the work at the agreement rates including any additions/alternations in drawings/specifications as may be instructed by the Engineer-in-Charge during course of execution of the work.
5. The Contractor will install display board at his cost mentioning information about the work at worksite after drawl of the agreement.
6. The work has to be executed strictly as per drawings and specifications. The Contractor has to engage technical persons to assist the corporation for taking initial levels, final levels, giving layout and to supervise day-to-day work.
7. Required Engineering personnel for day-to-day supervision of works will be provided by the Contractor. Engineering personnel of OCCL will monitor the quality and progress of work and will do check measurement for payment.
8. The quantities mentioned against each item of work are subject to variations. Such variations shall not vitiate the contract. The rates quoted shall apply for increased or decreased quantities of different items.
9. **The bidder has to visit the site and quote his rate which should include cost of haul road, dewatering if required by suitable method and other ancillary works for completion of work and no extra payment shall be made.**
10. **PERIOD OF COMPLETION:**

    This work is to be completed in all respect within **11 (Eleven)** calendar months (including rainy season) from the date of issue of work order. The Contractor, whose tender is accepted must submit a programme of work within 7(Seven) days after issue of work order for approval of the Engineer-in-Charge. The Contractor will execute the work strictly as per the programme submitted by him, failing

which action will be taken by the Senior Manager as per clauses indicated in the general terms and conditions of OCCL

11. OCCL shall provide temporary Bench Mark (T.B.M.) at convenient location. The Contractor has to establish at his cost sufficient Nos. of temporary B.Ms. for smooth execution and measurement of work.

12. Due to non-issue of design and drawings by the client in time and any hindrances caused due to non-settlement of rehabilitation and resettlement problems if any by the client which may likely to affect the progress of work or stoppage of work, the Contractor shall have no right to claim any compensation in whatsoever manner from OCCL. The Senior Manager (Civil) in-charge of the work may direct the Contractor to suspend the work or any part of the work temporarily for any period as may be necessary. This temporary suspension shall not vitiate the contract and the Contractor shall not be entitled to any claim on account of such temporary closure. However this temporary suspension period will be considered towards extension of time for completion of the work.

13. All materials required for the work shall be approved by the Engineer-in-Charge before use in the work. The contractor must extend necessary co-operation for sampling and testing of materials by OCCL/client. However, testing charges shall be borne by the Contractor.

14. The Contractor has to obey all rules and regulations for movement of transport vehicles in main roads, village roads, in factory and colony areas. He has to obtain necessary permission from the concerned authorities at his cost and risk. Necessary permission/license for borrowing earth from borrow areas whether Government or private will be borne at his own risk and cost. The rate quoted is inclusive of such expenditure.

15. The Contractor shall allow the quality control organization to take as many samples as may be required by them during course of execution of different items of works. He shall also extend necessary co-operation to carry out any number of field tests as may be necessary. Any portion of work or material rejected by Quality Control Organization/ Department shall be treated to have been finally rejected by the Engineer-in-Charge.

16. Maintenance of the work during construction and during the **Defect Liability Period of 1 (one) year after completion of the work** is the responsibility of the Contractor.Defect liability period of 1 (one) year is applicable for the structure part of the work only.

17. The Contractor shall display notice both in English and Oriya indicating prevailing wages of different categories of labour in a conspicuous place. He shall also maintain wage book of each worker and shall issue wage cards in the prescribed forms to different workers.

18. Payment for the work done by the Contractor shall be based on actual field measurement. The Contractor or his authorized representative shall be present at the time of recording the measurement at each stage and sign the field level book and measurement book as token of acceptance.

The payment for the quantity of different items executed by the Contractor shall in no case exceed the quantity admitted by the Department for the respective items and certified / paid to OCCL.

19. Statutory deductions, such as security deposit, income tax including surcharge, hire charges of machineries, cost of materials, EPF contribution, labour clearance etc. shall be deducted from the R/A bills. If the Contractor fails to submit the receipt in support of payments towards royalty, cess, tolls and other taxes, the same shall also be deducted from the R/A bills.

20. **SAFETY PROVISIONS:**

The Contractor shall at his own expenses arrange for the safety during construction as required including the provisions in the safety manual published by the Central Water and Power Commission, New Delhi (January'1962) edition). In case the Contractor fails to make such arrangement, the corporation shall be entitled to cause them to be provided and to recover the cost thereof from the Contractor. For failure to comply with the provision of the safety manual, the Contractor shall without prejudice to any other liability pay to the Corporation a sum not exceeding **rupees five hundred per day** for each day of default.

21. **ACCIDENTS :**

It shall be the Contractor's responsibility to protect against accidents on the works. He shall indemnify the corporation against any claims for damage or for injury to person/ machineries/ transport/ vehicle property resulting from any in the course of work and also under the provision of the workmen's compensation Act.

On the occurrences of an accident arising out of the works which results in death or which is so serious as to be likely to result in death, the Contractor shall within twenty four hours of such accident report in writing to the Senior Manager (Civil) in charge of the work stating the fact clearly and in sufficient details the circumstances of such accidents and the subsequent action. All other accidents on the works involving injuries to persons of damage to property other than that of the Contractor shall be promptly reported to the Senior Manager stating clearly and in sufficient details the facts and circumstances against all loss or damage resulting directly or indirectly from the Contractor failure to confirm to the provisions of the said act in regard to such accidents. In the event of an accident in respect of which compensation may become payable under the workmen's compensation Act including all modifications thereof. The Senior Manager (Civil) in charge of the work may retain. Out of any money due and payable to the Contractor such sum or sums of money as may be in opinion of the Senior Manager be sufficient to meet such liability. On receipt of award from the Labour Commissioner in regard to quantum of compensation, the difference in amount will be reimbursed or recovered from the Contractor

22. WAGES :

Wages shall have the same meaning as defined in the payment of wages Act and include time and piece rate wages, if any.

(i) Display of notices regarding wages etc.

The Contractor shall :

(a) Before he commences his work, continue to display and correctly maintain in a clean and legible condition in conspicuous places on the work, notices in English and in the local India language spoken by the majority of the workers, giving the rates of wages prescribed by the State Public Department/Electricity Department for the district which the work is done.

(b) Send a copy of such notice to be Engineer-in-Charge of the work.

(ii) Payment of wages :

(a) Wages due to every workers shall be paid to him / her directly.

(b) All wages shall have to be paid in current coin or currency or in both.

(iii) **Fixing of wages period :**

(a) The Contractor shall fix the wage period in respect of which the wages are payable.

(b) No wage period shall exceed one month.

(c) Wages of every workman employed on the contract shall be paid before the expiry of ten days, after the last day of the wage period in respect of which the wages are payable.

(d) When the employment of any worker is terminated by or on behalf of the Contractor, the wages earned by him shall be paid before the expiry of the day succeeding the one on which his employment is terminated.

(e) All payments of wages shall be made on a working day.

(iv) **Wage book and wage cards etc. :**

(a) The Contractor shall maintain a wage book of each worker in such as may be convenient, but the same shall include the following particulars.

(b) Rate of daily/monthly wages.

(c) Nature of work on which employed.

(d) Total No. of days working during each wage period.

(e) Total amount payable for the work during each wage period.

(f) All deductions made from the wages with an indication in each case of ground for which the deduction(s) is/are made.

(g) Wage actually paid for each period.

23. During excavation of cut-off-trench and other components, shoring, shuttering including cost, carriage of materials including all taxes and cost of dewatering is to be borne by the contractor. Only the designed sectional quantity will be paid. Dewatering from the foundation trenches including and running charges of pump and coffer dam if required will be borne by the contractor.

24. It must be definitely understood that the Corporation / Government do not accept any responsibility for the correctness and completeness of the trial borings shown in the cross sections.

25. Excavated materials and debris unused in the area are to be removed from the site by the contractor at his own cost and responsibility as per the direction of Engineer-in-charge.

26. All measurement for earthwork excavation will be taken by section measurement. The bidder is to sign the longitudinal section and cross section of existing ground level before starting execution of the work. Final levels will be taken after completion of the work in all respects.
27. The work will be executed as per approved drawing, design and B.I.S. specification and as per the instruction of Engineer-in-charge.

28. No claim whatsoever on account of interest will be entertained under any circumstances.

29. The Contractor will remain responsible to arrange all mechanical means whenever required to complete the work in time at his own cost.

30. Unutilized Moorum, Metal, Chips, Sand and stones outside the specific alignment or away from the working area will not be taken into consideration for measurement.

31. Any damage caused to the work due to any cause except major natural calamity whatsoever during the execution will be made good by the contractor until it is handed over to the Department in complete shape.

32. The quantities provided in the tender schedule are tentative which is likely to vary during execution as directed by the Engineer-in- charge. Before starting the work, the initial levels will be taken for his acceptance. The final bill be paid on level sections only.

33. Borrowing earth for the Embankment is the responsibility of the Contractor. The type of soil to be used in the embankment is to be got approved by the Engineer-in- Charge before use.

34. DELETED

35. No extra cost is to be paid to the contractor towards construction of coffer dam, diversion channel, approach road & haul road required for execution of work. The approach road / haul road to work site will be maintained by the contractor.

36. The detail specification enclosed with the tender papers for different item of work should be strictly adhered to during course of execution of work.

37. If departmental land is available, the contractor will be allowed to use the same for accommodation of his labourers, stores and machineries free of rent. If department land is not available the contractor will make his own arrangement for land for such requirement at his own cost.

38. The bidder should obtain equipment for the work. However, some equipment if available in the corporation will be given on hire and condition to be fixed by the Engineer-in-charge. Time for charging of cost of hire will be reckoned from the date on which equipment will be handed over to the contractor to the date of its return to the corporation, after the work is completed or the contract is rescinded, or when the contractor does not require the same. The daily hire charges of the machineries will be realized from the contractor's bill on the basis of each day the machines will be under his custody. The contractor will return the equipment in perfect running condition as it was at the time of issue. While the departmental machineries given on hire are with the contractor, compensation towards any loss or damage of the same shall be paid by the contractor to make good the loss or damage. The amount of compensation will be decided by the Engineer-in – charge. The contractor shall not remove the equipment from the site while the same is in his custody. If any equipment or any part thereof is required to be sent out from the site for repair or otherwise, written permission from the Engineer-in-charge shall be taken. The contractor should maintain repair, overhaul and the equipment with due diligence and care. Proper grades of fuel, oil and lubricants should be used. Only good and genuine parts should be used. The equipment shall be made available for inspection by the Engineer-in-charge or other competent authority. If the equipments are not maintained, repaired or used properly, the contractor is

liable to pay compensation to the department towards the damage caused to the equipment for improper use. The amount of compensation shall be assessed by the Engineer-in-charge which will be final.

39. The quantity mentioned can be increased or reduced to the extent of 10% for individual items subject to a maximum of 5% over the estimated cost. If it exceeds the limit stated above, prior approval of competent authority is mandatory before making any payment.

40. The period of completion is fixed as **11 calender months (including rainy season)** and cannot be altered except in case of exceptional circumstances with due approval of next higher authority / Client Department.

41. Royalty for stone products, sand and Borrow earth are to be recovered from the contractor's bill as per prevailing Govt. Notification.

41. The Contractor is required to establish a field laboratory with required equipments for quality control testing at site at his own cost.

42. **Testing of reinforcement bar and concrete works.**

(i) If, in the opinion of the Engineer-in-Charge of the work, the reinforcement bars to be used in the work requires testing in order to confirm its technical specification, the same shall be tested either in the Department laboratory or in any other authorized laboratory as referred by the Engineer-in-Charge at the cost of the contractor. The contractor shall bear all the cost towards supply of required samples, transportation and testing charges. The decision of the Engineer-in-Charge on this aspect is final and binding on the contactor.

(ii) All the testing of concrete works shall be carried out as per the direction of the engineer-in-charge or his authorized field functionaries and in case of any dispute arises on this aspect, the decision of the **Engineer-in-Charge** is final and binding on the contractor. Testing of all the concrete works of all grade required for structures, Cement Concrete lining and in any other construction activities of the work shall be tested in the Department Laboratory at the cost of the contractor. The contractor shall supply all the required samples at his own cost including transportation and bear all the testing charges of the concrete. The cost for the testing as charged by the Govt Quality control testing unit shall be final and binding on the contractor. If, in the opinion of the engineer-in-charge a Field Laboratory for acceleration of testing of concrete is required, the contractor shall install it at the work site at his own cost with all the required machineries and equipments as per the direction of the engineer-in-charge and cement testing work shall be carried out in the Field Laboratory under the direct supervision of the Field functionaries of the Govt Quality control testing unit.

SECTION-IV

GENERAL TERMS & CONDITIONS

General terms and conditions

1. DEFINATIONS

(i) **"CORPORATION"** means **"ODISHA CONSTRUCTION CORPORATION LTD. ("OCCL" in short)"** with registered office at Unit-8, Gopabandhu nagar, Bhubaneswar – 751 012 (Odisha) represented through its Managing Director or any other officer as designated by the "Corporation" from time to time.

(ii) **"ENGINEER-IN-CHARGE"** means the qualified engineer deployed by the "Corporation" at work site for the work including the Senior Manager (Civil), Cuttack Group of Projects, Cuttack.

(iii) **"CONTRACTOR"** means the enlisted person/firm/organization having men, machinery, materials etc. to execute the work satisfactorily as per scope indicated herein within stipulated period.

(iv) **"CLIENT"** means the State Govt. or Central Govt. organization or any individual from whom "OCCL" has received the work for execution.

2. AGREEMENT

The "Contractor" shall enter into an agreement with the "Engineer-in-Charge" in the format on requisite value of stamp paper prescribed for the purpose by the "Corporation" within a stipulated period to be specified by the "Engineer-in-Charge" failing which, the EMD and ISD shall be forfeited. The work may be awarded in favour of some other agency at the discretion of the "Corporation".

3. RATE

The rate quoted by the quotationer is to be indicated in Rupees which shall be valid for the full period of execution or till completion of work, whichever is later. No escalation or price variation in whatsoever form shall be entertained. The rates quoted by the "Contractors" should be firm for the entire period of execution or till completion of work, whichever is later.

The "Contractor" shall quote the rates to complete the works as per specifications inclusive of all transportation, handling, loading, unloading, lift, de-lift, royalty, taxes, duties, levies, incidental expenses etc. that will be applicable on the work to be executed by him. No claim in this regard in whatsoever form shall be entertained. However, the applicable rates of taxes, duties, royalty etc. shall be indicated separately by the quotationers in the bill of quantities.

4. PAYMENT TERMS

(j) The rates shall remain firm throughout the full period of execution or till completion of work, whichever is later.

i) The payment to the "Contractor" shall be limited to the measurements taken and accepted by the client. The "Contractor" cannot raise any dispute over the measurements allowed by the "Engineer-in-Charge" for the purpose of payment.

ii) The "Contractor" will bear the full cost of rectification or replacement of works required as per direction of "Client" or "Engineer-in-Charge".

iii) Any penalty levied by "Client" on "OCCL" due to delay in work will be borne by the "Contractor" in full, if the "Contractor" is responsible for delay.

5. INITIAL SECURITY DEPOSIT (ISD)

The "Contractor" shall deposit Initial Security Deposit (ISD) at the rate of 2(Two) % of the work/agreement value on receipt of letter of intent of work within a period of 7 days from the date of

issue but before execution of agreement. After receipt of the full ISD, the EMD received along with the Quotation shall be returned.

If the tenderer desires, the EMD can be converted to ISD and the balance amount of ISD has to be deposited. If the "Contractor" fails to deposit such initial security within the stipulated date, the EMD of the "Contractor" shall be forfeited and the work may be awarded in favour of some other agency at the discretion of the "Corporation". The ISD will be released after completion of the work and settlement of the final bill of the Contractor.

6. SECURITY DEPOSIT (SD)

The Security Deposit (SD) at the rate of 5(Five) % shall be deducted on the gross amount (excluding GST) of each bill of the "Contractor". The security will be released after expire of the defect liability period or settlement of final bill of the "contractor.", whichever is later, if no defect in the work is noticed and material account as well as all disputes including compliance of labour rules, ESI rules etc. are settled.

7. WITH HELD AMOUNT FOR EPF, FPF AND ESI DUES

2 (Two)% shall be deducted and kept withheld from R.A. bills of the "Contractor" towards EPF, FPF and ESI dues. If the "Contractor" produces clearance in support of deposit of EPF, FPF and ESI dues with the concerned authority within 3(Three) months from the end of each financial year, the above-withheld amount shall be released. Otherwise, the "Corporation" shall deposit the same with Provident Fund Authority and ESI Authority. Defects, if any, shall be recovered from the "Contractor".

8. INCOME TAX, GST, OTHER TAXES, DUTIES, LEVIES ETC.

Income tax at the prevailing rate from time to time will be deducted from each bill of the "Contractor" and shall be deposited with Income Tax Authorities. The Contractor have to quote the percentage rate excluding GST (Goods and Service Tax).

In case of increase in rates of royalty and taxes or imposition of duties after opening of quotations, the same will also be deducted from the bills of the agency and the differential amount of royalty and taxes due to increase in rates/imposition shall be reimbursed to agency on production of supporting documents in original.

In case of decrease in rates of royalty and taxes after opening of quotations, the same in decreased rates will be deducted from the bills of the agency and the differential amount of royalty and taxes due to decrease in rates shall also be deducted by the "Corporation" from the bills of , which will be retained by the "Corporation".

9. ELECTRICITY

Electricity required for execution of the work by the "Contractor" for "OCCL" shall be provided by the "Corporation" at one point only from where, the "Contractor" shall arrange further distribution with his own materials and labour. The energy charges as per actual shall be deducted from the bills of the. "Contractor". In case of power failure, alternative arrangements shall be made by the "Contractor" for continuity of production of coarse aggregates.

10. MEASUREMENT OF WORK

The quantity of work executed shall be measured and payment made once in a month or on completion of work or on termination of the agreement, when final measurement will be made and account will be adjusted accordingly. The decision of the "Engineer-in-Charge" regarding the rates, progress, measurement and quality of the work shall be final and binding on the "Contractor".

11. PAYMENT TO WORKMEN

The "Contractor" should maintain job register and payment rolls of their workmen and get those checked by the "Engineer-in-Charge" or his authorized representative from time to time. The payment to the workers/ supervisory staff shall be made by the "Contractor" in the presence of the owner and/or "Engineer-in-Charge" or his authorized representative. The paid pay roll register shall be signed by the "Engineer-in-Charge" or his authorized representative as a token of disbursement. The copies of paid pay roll shall be submitted to the "Engineer-in-Charge" within a period of 7(Seven) days from the date of payment failing which no further payment to the "Contractor" shall be released.

12. WORKMEN COMPENSATION

In case of any loss due to accident arising during/in connection with execution of the contract, the "Contractor" will pay compensation to his workmen. The "Contractor" will be fully responsible for his workmen as per workmen's compensation act and labour laws in force during entire period of execution of contract. In case, the "Contractor" fails to do so, the "Corporation" may pay the same and recover the same from the bills/ dues of the "Contractor".

13. INFORMATION OF WORKMEN

The "Contractor" will make his own arrangements for procurement of labour and shall furnish all information of workmen employed by him like name, father's name, full permanent address, sex and age to the "Engineer-in-Charge" along with the pay.

14. STATUTORY REQUIREMENTS

The "Contractor" shall comply all statutory requirements applicable at site of work such as minimum wage act, labour act, factory act, workmen's compensation act, provident fund rules, employee's state insurance rules etc. A certificate to this effect shall be enclosed by the "Contractor" with each Running Account Bill for payment.

15. MINIMUM AGE OF WORKMEN

The "Contractor" shall not employ any person, who is below the age of 18 years or unfit for the tendered items. The "Engineer-in-Charge" shall have right to decide, whether any labour employed by the "Contractor" is below the age of 18 years or unfit and refuse to allow any labour, whom he decides to be below the age of 18 years or unfit for any other reason.

16. LABOUR LICENCE

The "Contractor" has to obtain valid labour license and maintain all records at his own cost as per the conditions laid down in the labour rules in vogue and amended from time to time.

17. MINIMUM WAGE ACT

The "Contractor" shall pay wages of each labour at the rate not less than the wages as per Minimum Wages Act in force and as may be amended from time to time. The "Engineer-in-Charge" has the right to enquire into and decide on any complaint of the Labourers relating to non-payment or less payment of wages to them and his decision will be final and binding on the "Contractor".

18. NON-PAYMENT OF DUES OF LABOURERS

If the "Contractor" fails to pay the dues of Labourers engaged by him for this work in time, the same shall be paid by the "Engineer-in-Charge" directly to the deserving workers. The expenditure so incurred on account of non-payment or less payment shall be recovered from the bills or any other dues of the "Contractor".

19. PROVIDEND FUND (PF)

Employees Provident Fund., wherever applicable, shall be payable by the "Contractor" as per the Provident Fund Rules in force and shall keep the "Corporation" indemnified for it. He should get the

registration number for this from the Regional Provident Fund Commissioner, Orissa. He shall produce the records in support of payment of EPF dues to the "Engineer-in-Charge" for check and record by the "Engineer-in-Charge".

20. WORKMEN INSURANCE

The workmen insurance shall be the responsibility of the "Contractor". He shall produce the records in support of workmen insurance to the "Engineer-in-Charge" for check and record.

21. HUTMENTS/TEMPORARY ACCOMMODATION

The "Contractor" has to arrange hutments/temporary accommodation for his own Labourers/ workmen at the work site at his own cost.

22. IDLE LABOUR

"OCCL" will not be held responsible for idle Labourers of the "Contractor" for any reason, whatsoever and no claim on this account will be entertained.

23. WORKING IN SHIFTS

If necessary, the "Contractor" may be asked to work in two (2) or 3(three) shifts. Normally, the work shall be executed in shifts. The "Contractor" may, if required, have to engage the workmen on overtime to complete the work in scheduled time. The overtime cost shall be borne by the "Contractor".

24. CLAIMS AND LIABITIES

All claims/liabilities etc. arising out of Explosives act and labour laws shall be borne by the "Contractor" and he shall keep the "Corporation" indemnified against them and also in case of injuries or death of Labourer(s) resulting from accidents during the execution of the work. In case the "Corporation" will have to pay for any such claims under Workmen's Compensation Act, the same shall be adjusted from the pending bills/dues of the "Contractor" or shall be recovered otherwise as per law from him.

25. SAFETY

The "Contractor" should abide by the safety laws and rules of statutory bodies, "Corporation" and owner as per directions of "Engineer-in-Charge" and Safety Officers inspecting from time to time.

26. WATCH AND WARD

The "Contractor" shall arrange watch and ward and safety of the site of work, constructed structures, machinery, vehicles, equipments, tools, tackles, consumables, cement, steel materials etc. of the "Corporation" and owner at his own cost.

27. AUTHORISED PERSON

The "Contractor" may in writing authorize his power of attorney holder or any other person to draw materials, avail facilities, attend measurements etc. during the course of execution of work. All liabilities created by the authorized person of the "Contractor" by way of loss of materials drawn, amenities availed, unpaid wages created etc. shall be considered as the liabilities of the "Contractor" and such liabilities shall be made good by the "Contractor" or it shall be recovered from the bill/payment due to him.

28. DELETED

29. BREACH OF CONTRACT

The ISD including EMD, SD and additional SD are liable to be forfeited in the event of breach of contract and the agreement shall be terminated. The dues of the "Corporation" including due of Labourers/workmen and other statutory payable liabilities payable by the "Corporation" as principal employer shall be cleared by the "Contractor". The decision of the "Engineer-in-Charge" in this regard

shall be final and binding on the "Contractor". The amount remaining as outstanding against the "Contractor" after adjustment of his dues shall be payable by him to "OCCL". If necessary, legal action may be taken for recovery of the dues of the "Corporation" including labour and statutory dues to be cleared by the "Corporation" as principal employer and "OCCL" reserves the right to recover the payable amount from the "Contractor" from works done by his under any other organization or from his properties.

30. TERMINATION OF CONTRACT

The "Engineer-in-Charge" may put an end to the agreement at his option at any time due to (a) Bad workmanship (b) Disproportionate progress (c) Non-compliance of labour rules or (d) Any other reason. The decision of the "Engineer-in-Charge" is final in this respect and no claim on this account will be entertained. "OCCL" also reserves the right to take ex-party measurements, if the "Contractor" does not co-operate in taking final measurements after termination of contract.

At this situation, the Senior Manager (Civil) on behalf of the Odisha Construction Corporation Limited, shall have power to rescind the contract (of which rescission notice in writing to the Contractor under the hand of the Senior manager (Civil) shall be conclusive evidence) **20% of the value of left over work subjected to maximum 10% of agreement value will be realized from the Contractor as penalty.**

31. RESPONSIBILITY OF CONTRACTOR

The work shall be completed by the "Contractor" in all respect within the stipulated period of completion and the responsibility of the "Contractor" shall cease only, when the items are fully accepted by the owner after erection at project site.

32. PROGRESS OF WORK AND PENALTY

The "Contractor" will achieve the desired progress as per programme.. If the "Contractor" fails to achieve the contracted quantity every month as per programme, penalty at the following rates shall be imposed.

Sl. No.	Failure percentage (%)	Penalty percentage (%)
(i)	Less than 10(Ten)%	1(One)% of value of defaulted quantity
(ii)	Above10 (Ten)% and up to 20(Twenty)%	2(Two)% of value of defaulted quantity
(iii)	Above 20(Twenty)% and up to 30(Thirty)%	5(Five)% of value of defaulted quantity
(iv)	Above 30(Thirty)%	To be asked to demobilize with penalty equivalent to 10(Ten) % of value of defaulted quantity. The "Engineer-in-Charge" will off-load the work and get the work done through any other agency or of its own at the risk and cost of the "Contractor". No claim will be allowed to the "Contractor" in this regard.

33. REJECTION DUE TO BAD WORKMANSHIP

The rejection due to bad workmanship shall be charged to the "Contractor" at a cost of rejected items plus 20(Twenty) %.

34. QUALITY ASSURANCE AND QUALITY CONTROL

Quality Assurance/Quality Control Plan shall be prepared before commencement of site activities and shall be followed maintaining stage-wise up-to-date record of the work.

35. SITE VISIT

The "Contractor", interested to participate in the Quotation, should visit the site of work and get himself acquainted with site conditions and tendered work before submitting the Quotation.

36. DEVIATION OF PROVISIONS IN AGREEMENT

The "Contractor" will not vary or deviate from the provisions in the agreement without obtaining prior permission in writing from the "Corporation".

37. RIGHT OF THE "CORPORATION"

The "Corporation" reserves the right to cancel a particular quotation call or all quotation calls without assigning any reason thereof. The items can be splitted among two or more tenderers at any stage. The offer of any quotationer or all may be cancelled without assigning any reason thereof. The requirement shown in any quotation call notice are only indicative and may vary.

38. APPROACH ROAD, HAUL ROAD ETC.

The approach road, haul road etc. if required, at site of work are to be constructed and maintained by the "Contractor" at his cost.

39. SUB-LETTING

The work under any agreement shall not be assigned or sublet to anybody by the "Contractor". If the "Contractor" shall assign or sublet or attempt to do so, the "Engineer-in-Charge" shall terminate the agreement and shall get the work done through any other agency or of its own at the risk and cost of the "Contractor". No claim will be allowed to the "Contractor" in this regard. "OCCL" reserves the right to have access also to units of the "Contractor" to verify, if works are actually executed by him.

40. EXECUTION OF EXTRA ITEMS AND EXTRA QUANTITIES

Items of work not covered in the BOQ shall be paid at the mutually agreed rate within the current schedule of rates of the state and those not covered by the said schedule rates will be paid, on actual analysis approved by the competent authorities.

41. FORCE MAJEURE:

Neither party shall be liable to the other for any loss or damage occasioned by or arising out of acts of God such as unprecedented flood, volcanic eruption, earthquake or other convulsion of nature and other acts such as but not restricted to invasion, the act of foreign countries, hostilities, or war-like operations before or after declaration of war, rebellion, military or unurped power which prevent performance of the contract and which could not be foreseen or avoided by a prudent person.

42. JURISDICTION

For all liabilities created under the various contractual obligations/impositions under this agreement, the "Contractor" undertakes not to raise any dispute or litigations in connection there with and shall make all endeavors to resolve all disputes amicably through conciliation and in all such cases, the decision of the Managing Director, "OCCL" shall be final and binding on the "Corporation" as well as on the "Contractor" failing which all such disputes arising out of the agreement shall be subject to jurisdiction of Hon'ble High Court of Orissa at Cuttack and their sub-ordinate courts at Bhubaneswar only. Both the parties agree by mutual consent that any dispute relating to this agreement is barred from arbitration.

43. If any material is supplied by OCCL, the rate will be decided on mutual discussion.

PERCENTAGE RATE TENDER AND CONTRACT FOR WORKS

GENERAL RULES & DIRECTIONS FOR THE GUIDANCE OF CONTRACTORS

1. The work proposed for execution by contract will be notified in a form of invitation to tender posted through websites www.tendersodisha.gov.in & www.odishaconstruction.com

This notice will state the work to be carried out, the items and approximate quantities thereof as well as the date for submitting and opening tenders also the amount of earnest money to be deposited and the amount of the security deposit by the successful tenderer and the percentage if any to be deducted from bills. Copies of the specifications, designs and drawings and any other documents required in connection with the submission of tender signed for the purpose of identification by the Sub-divisional Officer/Executive Engineer shall also be open for inspection by the Contractor at the office of the Sub-Divisional Officer/Executive Engineer during office hours.

2. In the event of the tender being submitted by a firm it must be signed separately by each member thereof, or in the event of the absence of any partner, it must be signed on his behalf by a person holding a power of attorney authorizing him to do so.

3. Receipts for payment made on accounts of works, when executed by a firm must also be signed by the several partners, except where the Contractors are described in their tender as a firm in which case the receipts must be signed in the name of the firm by one of the partners, or by some other person having authority to give effectual receipts for the firm.

4. The memorandum of work tendered for and the memorandum of materials to be supplied by the OCCL and their issue rates shall be filled in and completed in the office of the Senior Manager (Civil) before the tender form is issued if a form is issued to an intending tender without having been so filled in and completed, he shall request the office to have this done before he completes and delivers his tender.

5. The amount of earnest money to be remitted will be 1% (online).

6. The Engineer-in-charge or his duly authorized assistant will open the tenders in the presence of any intending Contractors who may be present at the time and will enter the amounts of the several tenders in a comparative statement in a suitable form. In the event of tender being rejected the earnest money shall thereupon be returned to the tenderer.

7. The Engineer-in-charge shall have the right of rejecting all or any of the tenders.

8. In the event of a tender being selected for acceptance the Engineer who opened the tenders will, if he is competent to accept the tender, inform the tenderer of the selected.

tender who shall there upon sign copies of the specification and other documents with the agreement. The tenderer of the selected tender shall also deposit the required amount of the security money within the prescribed time. If the tenderer fails to deposit the required amount of the security money within the prescribed time the Engineer-in-charge may reject the tender.

If the Engineer is not competent to accept the tender himself, he will inform the tenderer of the tender which he decides to recommend for acceptance, such tenderer shall thereupon sign forthwith copies of the specification and other documents mentioned in rules 1 and 4 and shall deposit the required amount of the ISD/PSD within the prescribed time. The tender with the specification and other documents signed by the tenderer will then be forwarded for acceptance to the Engineer who is competent to accept the same. If the said Engineer rejects the tender the ISD/PSD deposited shall be refunded to the tenderer.

9. When a tender is selected for acceptance, the tenderer shall deposit the required amount of the ISD/PSD. No tender shall be finally accepted until the required amount of the ISD/PSD has been deposited.

10. The amount of Initial security Deposit to be deposited by the tenderer whose tender is selected for acceptance shall be 2 (two) percent of the agreement value of the work, failing which tender shall be liable to rejection.

Taxes as per provisions of Government shall be deducted from the bills of tenderer.

11. When tender has been selected for acceptance and the required amount of the security money has been deposited the Engineer shall scrutinize all pages of the form of item, Rate Tendered/quoted percentage in case of percentage tender and Contract for works to see that the form has been properly filled up and signed by the Contractor and the signature witnessed. He shall then, if he is competent to accept the tender, sign the acceptance of the tenders or if he is not so competent to, shall send the form for signature of the acceptance to the officer competent to accept it.

12. All tenderers are required to submit a list of works, which are in hand at the time of submitting their tenders. The list of works are required to be submitted in the proforma by the Executive Engineer under whom he has executed the work in order to judge their past performance (vide Works Department Circular No. 15443 dt. 01.08.2005.)

13. The earnest money deposited is liable to be forfeited to Corporation, if the tenderer backs out from the offer before acceptance of the tender by the competent authority.

14. IT towards GST will be deducted at the rate prescribed in the Odisha Goods & Service Tax Act-2017 or as amended from time to time.

SECTION-V

TECHNICAL SPECIFICATION

SECTION – 1

GENERAL INFORMATION

1.0 General Information & Scope of Work

1.1 Description of work to be executed:

Name of the work: **"Renovation of Old Gobari Drainage Cut from RD 0.00 KM to 14.62 Km outfalling to Gobari Drainage System."**

1.2 **Location of work site:**

The work site is located near village Gandakhia Dist.Kendrapada & RD 0.00 KM starts from Gandakhia bridge ends at RD. 14.62 Km near Patamundai women's college,

1.3 **Transport communication facilities.**

The contractor has to make arrangement at his own cost to transport all his construction equipments, construction materials and labour to work site, as stated via above route.

1.4 **Climate :**

The project area has moderate climate with temperature varrying from 12^0C to 42^0C.

1.5 **Availability of Labour:**

Unskilled labours required for the work are available in project area and it is preferable to engage local labour. However the Contractor must make his own arrangements for labour / machineries / equipments required to complete the work in all respect.

1.6 **Nearest Town:**

The nearest town to the work site is Kendrapara.

1.7. **Availability of Petrol, Diesel and other lubricants:**

Nearest petrol pump is at Pattamundai, Dist- Kendrapara.

1.8 **Electric Supply:**

The Contractor shall make his own arrangement for providing electric supply to worksite at his own cost if so required by him.

1.9 **Observation of Rules:**

The Contractor shall take precaution to ensure safety to the workers. The department will not take any responsibility for accident if any that may occur during the period of execution. The Contactor shall take immediate action to rectify the defects, immediately if any during the period of execution pointed out by the Department. Labour license must be produced before the starting of work.

1.10 **Housing Facilities:**

Private house may or may not available in the vicinity of the work site. The Contractor shall make his own arrangement for housing of the labours, workers and staff at the work site.

1.11 **Medical Aid:**

The nearest Health Centre available at Kendrapara. However, the Contractor shall make first aid arrangement at his own cost in accordance with rule and regulations of prevailing Labour Act.

1.12 **Post, Telephones & FAX**:

Post, Telephones, & Fax are available at Kendrapara.

1.13 **Local Roads:**

The existing available approach road to the work site can be used by the contractor. The contractor shall however construct and maintain the connecting roads in the working areas including drainage, sanitary etc. at his own cost. The contractor shall construct haul road and other approach road as may be necessary for proper execution of the work at his own cost.

1.14 General Information:

1.14.1 The information and the data related to work site conditions described above represents the site condition in general and for information of the bidders/contractors. The department does not guarantee the reliabilities or accuracy of any other data. The Contractor shall undertake at his expense such studies as are necessary to assess the reliabilities and accuracy of information presented.

1.14.2 It shall be presumed that the bidder / contractor visits site of proposed work at his expense and satisfy himself as to the nature and location of work and local condition in general and particularly about the availability of construction materials, electricity supply, water supply, storage and handling of materials, disposal of soil, disposal of dredged material, road communication, availability of labour, movement of machineries and other related matters, planning for execution etc. before quoting his rates for different items of work. The OCCL/department therefore will not bear any responsibility for any interpretation or conclusion made by the contractor in respect of site condition and consequence thereof.

1.15 Sources of Fund :

Department of Water Resources.

SECTION-2

CLEARING OF SITE

2.1 Cleaning and Grubbing.

The work under these specifications including borrow area, submergence area, area under excavation or dredging shall be cleared of all plants, bushes, rubbish and other objectionable matters. The timber and other useful materials should be stacked as directed by the Engineer-in-charge and handed over to the Department. Trees designated by the Employer shall not be cut and shall be protected from injury. After handing over useful material to department the waste material shall be disposed off and removed from the site of work before the date of completion of the contract as approved by the Employer. The clearing operation shall be in accordance with clause 3.1, 3.1.1, 3.2 and 3.3 of IS 4701-1982 Indian code of practice for earthwork. Surface boulders either loose or partly embedded in the ground will have to be removed and stacked as directed.

2.2 Site Drainage and diversion and care of the river flows.

The Contractor shall handle all flows from natural drainage channels intercepted by the work. He shall perform any additional excavation and grading for drainage as directed and provide and maintain any temporary construction required to by pass or otherwise cause the flows to be harmless to the work and property. The contractor should design and construct the required coffer dams to divert the flows during execution if necessary. He should submit the design of the cofferdams and the diversion plans of the river flows and work progress schedule. They shall be submitted to the Engineer-in-charge for approval. When the temporary construction is no longer needed and prior to acceptance of the work the contractor shall remove the temporary construction and restore the site to its original condition as approved by the Engineer. The cost of all works and materials required for the above work shall be included by the bidder in the quoted price and no separate payment will be made for the same.

SECTION-3

EARTHWORK IN EXCAVATION

3.1 General.

a) The work to be done under these specifications shall consist of furnishing all tools, constructional plant, labour, materials and other things required for excavation in all strata, conveyance and disposal of the excavated materials, leads and lifts, temporary work for performance of all the

operations connected with the work embraced under the contract as will secure a satisfactory quantity of work.

b) Construction and maintenance of diversions in case diversion of streams where they were disturbed due to excavation of dam / barrage and appurtenant works and for construction of structures.

The list of I.S codes and other publications applicable to this section is given below.

The abbreviations, OSS, IS, IRC, B.S, ASTM shall be considered to have the following meanings.

OSS - Odisha Standard Specification

I.S - Indian Standard of the Bureau of Indian Standards

IRC - Indian Roads Congress

B.S - British Standards

ASTM - American Standard of the American Society of Testing Materials.

Earthwork:

Sl. No.	I.S. Number	Short Title
01.	IS:4701-1982	Code of practice of earth work on canal.
02.	IS:3764-4966	Safety code for excavation work
03.	IS:1200(Part-I)-1974	Measurement of building and Civil Engineering works.
04.	IS:2720(Part-2)-1973	Method of test for soils part-2. Determination of water content.
05.	IS:3701-1968	Safety code for excavation works.
06.	IS"3698(Part-I)-1966	Safety code for scaffolding
07.	IS:3696(Part-B)-1966	Safety code for ladders
08.	IS:4082-1077	Recommendation of stacking and storage of construction materials at site.

In addition to the above IS codes, the specifications of OSS and manual for Quality control and inspection shall also be complied with

3.2 Planning

a) Priority to the commencement of work, all relevant data shall be collected by the Contractor and drawings prepared by him showing the location of the excavation, spoil deposition and filling.

b) The contractor shall present his planning of the work along with required details to the Engineer at least 15 days before starting the work.

3.3 Setting out works

a) The contractor shall be responsible for the correct setting out of all works and its execution at his cost. The contractor shall execute the work true to alignment, grade and levels as shown in the drawings and as directed by the Engineer-in-charge and shall check these at frequent intervals. The contractor shall provide all facilities like labour and instruments and shall cooperate with the Engineer to check all alignments, grade, levels and dimensions. Such checking shall not absolve the contractor of his own responsibility of maintaining the accuracy of the works.

b) The contractor shall establish sufficient number of reference bench marks facilitating setting out of works and taking levels for purpose of measurements.

c) Prior to commencement of work, the Contractor shall erect additional permanent bench marks, reference lines, reference points and check profiles at convenient locations approved by the Engineer. The bench mark stones shall be of 900mmx225mmx150mm size with 450mm embedded under firm ground in concrete and 150mm projecting above ground. The Word 'BM' showing value of RL shall be conspicuously carved and painted.

d) The contractor shall take all precautions to see that the lines, points and bench marks are not disturbed by his work and shall make good of any such damage.

3.4 Clearing the site

The provisions of Section 2 on Clearing of Site shall be followed.

3.5 Recording of working levels for soils & rocks.

a) The area required for dams/barrage and appurtenant works or any other structure shall be cleared in accordance with the provisions of section 2. Measurements for soils and rocks will be based on levels. Initially on handing over site, net levels shall be taken at 2.5m or less interval as directed by the Engineer. The levels will be entered in field books and plotted in cross section sheets by the contractor in the presence of Engineer-in-charge or his representative. The contractor shall write a certificate "accepted the pre levels recorded on pages from ____ to ___" and sign at the end of levels in the level field book in token of acceptance

b) After stripping and prior to commencement of excavation cross sectional levels of the stripped surface shall be taken at the same locations and intervals and certificates as mentioned in (a) above shall be recorded.

At the earliest, cross sectional profiles taken after stripping shall be prepared duly plotting the pre levels and the contractor's signature shall be obtained on these cross section sheets. These cross sections called initial cross sections duly signed by the contractor and Engineer shall be preserved. Measurement of quantity will be based on these levels only. All linear dimensions shall be measured in metres to the nearest 0.01m; areas shall be computed in square meters nearest to 0.01 square metre. However, in case of rock excavation occurring in bed or sides, the actual quantity of rock shall be arrived at by taking block levels at 2.5m intervals all along the entire area of bed and sides.

c) No separate payment will be made to the contractor for the materials and labour provided for taking the cross sectional levels.

3.6 Earthwork Excavation in foundation.

Classification of excavated materials:

All materials involved in excavation shall be classified and got approved by the Engineer into the following groups.

a) All Kinds of soils

This shall comprise ordinary soils such as vegetable or organic soil turf, sand, silt, clay, mud, peat, black cotton soil, soft shale or loose moorum and hard soils such as stiff black cotton soil, stiff clay, compressed hard gravel, stoney earth, stone matrix, soft disintegrated rock removable by pick axes and crow bars, boulders not exceeding 300mm in any direction and mixture of these and similar material.

b) Hard Disintegrated Rock not requiring blasting.

Hard disintegrated rock not requiring blasting, hard disintegrated rock or soft rock or conglomerate rock and hard lime kankar removable by pick axes and crow bars.

c) Rock Requiring Blasting.

i) Fissured and fractured rock and boulders of size more than 0.30 cum upto 3 cum in size requiring ordinary blasting

ii) Fissured and fractured rock and boulders of size more than 0.03 cum upto 3 cum in size requiring restricted blasting using Jack Hammer with controlled charge.

iii) Hard rock, sheet rock and boulders more than 3 cum size requiring blasting with ordinary blasting.

iv) Hard rock , sheet rock and boulders more than 3 cum size requiring restricted blasting using Jack hammer with controlled charge.

3.6.1 Excavation of Foundation

Before any of the work for the excavation of foundation is taken up, all loose rock, semi-detached rock in or close to the area to be excavated that is liable to fall or otherwise injure the workmen or the works shall be stripped. The method used shall be such as not to shatter or render unsuitable or unsafe any rock that was originally sound and safe. Any material not requiring removal as contemplated therein, but which may later become loosened or unsuitable shall be promptly and satisfactorily removed.

a) Excavation in all soils.

Overburden excavation shall include removal of all material other than rock excavation. The overburden excavation shall include earth, gravel, hard and compact material such as cemented gravel and soft disintegrated rock and also all boulders and detached pieces of rock measuring 0.03 cum or less in volume.

b) Rock excavation.

Rock excavation shall include rock in place which cannot be excavated until loosened by blasting, barring or wedging and also all boulders or detached pieces of solid rock more than one cubic meter in volume.

The excavation shall be made to sufficient depth to secure foundation on sound rock, free from weathered material, open seams or other objectionable defects. All necessary precautions shall be taken to preserve the rock below and beyond the lines or excavation in the soundest possible condition. The rock excavation shall be done by controlled blasting using Jack hammer holes of 32mm dia or less with little charge such that the blasting done will neither open up seams nor crack the rocks beyond prescribed limit.

The firing of system of blasts shall be controlled by the use of delay detonators. As excavation approaches its final lines, the depth of holes for blasting and amount of explosives used for hole shall be progressively reduced and excavation shall be done by controlled blasting. Whenever further blasting is liable to injure the concrete it is to be discontinued and the excavation for final 0.5m completed by wedging, barring, chiseling, line drilling and broaching or other suitable methods.

No blasting shall be done within 15 meters of any permanent structure. Where blasting would create a hazard to existing structures for installation, rock excavation shall be performed by methods other than blasting. The general excavation will be to levels and shapes shown in the relevant approved drawings. The foundation levels are based on indication of preliminary borings and are subject to changes as per actual site conditions warrant. Before starting concrete or masonry work, as large an area as possible should be exposed for inspection and test, so that a nearby section excavated later should not disclose that the former section should have been taken to lower depth.

After excavation of hard rocks , recovered rocks shall be issued to the contractor at the current Schedule of Rates or percentage excess approved for the work whichever is higher. Recovery percentage should not be less than 70% of volume of rock blasted during execution.

c) Line drilling for rock excavation.

Where vertical or square faces of rock are required in portions of the work such faces of excavation shall be formed by line drilling and broaching. The diameter and spacing of the holes for line drilling shall be subject to approval. The spacing of the drill holes shall be sufficiently close to ensure that rock will break along the designed lines. No blasting will be permitted in the holes along the sides of the excavation but light blasting will be permitted in areas adjacent to the holes provided that where further blasting might injure the rock upon or adjacent to which concrete is to be placed, the use of explosives shall be discontinued and excavation completed by wedging, barring or other suitable methods. Wagon drills shall not be used as it may disturb the rock structure.

d) Preparation of foundation - initial

After completion of rough excavation of foundation, scaling and trimming operations for the final removal of all shabby weathered and dummy rock and loosened mass shall be done by chiseling, picking, wedging and barring. The final foundation surface shall present a rough outline to provide added resistance to sliding and all smooth surfaces shall be roughened. The final surface shall be free from

steep angles and sharp projections. Neither along the dam/barrage nor across, shall the foundation have a slope exceeding the angle of friction of concrete on rock. Where slopes are steep the rock shall be benched to give a downward slope towards upstream of about 1:10.

The foundation surface after cleaning out should be sounded by striking with hammer and portions which do not return a solid ringing sound shall be chiseled out. Sprinkling the area with water will indicate the joints in rock from the water lines which cling to the cleavages after the area has partially dried up. Such portions shall be tested for soundness and rectified where necessary.

3.6.2 Tolerance in excavation.

Measurements for soils and rocks will be based on levels. Initially on handing over the site, net levels shall be taken at 2.50 m or less interval as desired by the Engineer. The levels will be plotted in a cross section sheet and average level arrived at for purpose of determining the quantity of excavation. The contractor should sign the cross section sheets in token of his acceptance.

i. For excavation in rock a tolerance of 15cm beyond the profile will however be permitted. No extra payment will be made for the excavation beyond the designed profile. The over breakages within the tolerance limit of 15 cm shall be refilled with C.C M20 grade specified for foundations. No extra payment for filling such over breakage shall be allowed.

3.6.3 SPOILS

The excavated spoil in soils and hard rock is to be deposited outside the working area at suitable location in consultation with the Engineer-in-charge.

3.6.4 Hard rock boulders of size greater than 0.03 cum. shall be stacked. The stack shall be closely packed with minimum voids and 40% will be deducted from the stack measurements to obtain solid measurements (this is subject to increase in the case of loose packing).

3.6.5 The excavated material shall be stacked within the area approved by the Engineer - in - charge. If the excavated material is deposited in unauthorized land, such work will not be measured for payment unless suitable action as may be directed by the Engineer - in - charge is taken by the contractor. In additional to non - payment of such work suitable amounts as directed by the Engineer - in - charge will be recovered from the Contractor as directed towards any extra cost which may have to bear on account of the Contractors un-authorized action.

3.6.6 USE OF EXCAVATED MATERIALS

All the materials available from excavation will be the property of Govt. and shall be disposed as directed by the Engineer - in - charge. The Material of approved quality may be used by the Contractor in the item of work included in Schedule of requirement of the tender or on ancillary for preparatory work free of charge. Prior approval of the Engineer - in - charge for such free use shall however be taken.

3.6.7 No re-handling of excavated material due to injudicious selection of the place for dumping will be paid for.

3.6.8 Blasting executed by Contractor in connection with the works shall be carried out in the manner described under "Blasting operations – Instructions to contractors" Controlled blasting shall be carried out where desired in the manner as directed.

3.6.9 In conducting blasting operations, proper precautions shall be taken for protection of persons, the work and property. All Government laws and regulations relating to the design and location of powder magazines, transportation and handling of explosives and other measures enacted for the prevention of accidents at powder magazines shall be followed.

3.7 MEASUREMENT

3.7.1 All linear measurement shall be in meters correct to 0.02 meter and volumes worked out in cubic meters correct to 0.01 cubic metre.

3.7.2 The measurements for the foundation excavation shall be made according to the sections shown on the drawings or to such other sections including stepping and slopping back as authorized by the Engineer.

3.7.3 In case of excavation in rock, when measurement is not directly possible from section it may be arrived at by measuring volume from stacks of the excavated rock. All original works shall be measured by levels.

3.7.4 The Level books, the section sheets (in which the levels are plotted) and the calculation sheets shall be treated as adjuncts to the measurement books.

SECTION-4

DREDGING WORK

The following special conditions shall supplement the general conditions of contract. Whenever there is a conflict, the provisions herein shall prevail over those Conditions of Contract.

4.1 **Purpose of Dredging**

The purpose of dredging is to desilt the river bed for its maintenance, upkeep and to increase the water storage capacity and to avert natural disaster. The dredged materials are disposed to protect river embankment.

4.2 **Disposal**:

All dredged materials shall be dumped at the identified area fixed by the Department/Client or in the areas to be specified by the Engineer-in-Charge. The contractor shall ensure that no dredged material is dumped in the river due to defect of the dredger or for any reason. In the event of accidental dumping, the contractors shall remove such material immediately at his own cost and risk.

4.3 **Mobilization& demobilization:**

The contractor shall mobilize the dredger along with all equipments, machinery etc to the site work, unload the same at suitable location and carry the same to dredging locations and demobilize after completion of work at his cost and risk. No payment for mobilization, demobilization, making channel for movement of dredger etc shall be paid.

4.4 **Land formation:**

The dredging materials after dumping at disposal location shall be properly spread by mechanical / manual means with use of dozer / pay loader etc for leveling & reclaiming the area. The construction of channel for draining out of water is to be made properly to avoid water logging of the dumping site.

4.5 **Minimum interference:**

Dredging shall be carried out with minimum interference to navigation and movement of vessels as well as other conservancy work of the river and in accordance with the directions of the Engineer-in-charge.

4.6 **Idle charge:**

No idle charge of the dredger or any equipment, machineries, man power etc shall be paid due to suspension of dredging or earthwork in excavation for any reason or at the instruction of Engineer-in-charge.

4.7 **Substitution of dredger:**

Incase any of the dredger of the agency is not available for operation for any reason, then a substitute dredger with similar / higher specification shall be arranged by the contractor immediately as a replacement at no extra charge.

4.8 **Safety:**

(a.) contractor recognizes the importance of performing the work in a safe manner so as to prevent damage, injury or loss to (i) all individuals at the site, whether working or visiting, (ii) the work, including materials and equipment incorporated into the work or stored on-site or off-site, and (iii) all other property at the site or adjacent thereto, whether subject to an Access Agreement or not. Dredging Contractor assumes responsibility for implementing and monitoring all safety precautions and programs related to the performance of the work. Dredging Contractor shall, prior to commencing dredging, designate a safety Representative with the necessary qualifications and experience to supervise the implementation and monitoring of all safety precaution and programs related to the work. Unless otherwise required by the contract documents, Dredging Contractor's safety Representative shall be an individual stationed at the site who may have responsibilities on the project in addition to safety. The safety representative shall make routine daily inspections of the site and shall hold weekly safety meetings with dredging Contractor's personnel and others as applicable.

(b) Contractor shall comply with all legal Requirements relating to safety. Dredging Contractor will immediately report in writing and safety-related injury, loss, damage or accident arising from the work to engineer-in charge and, to the extent mandated by legal requirements, to all government or quasi-government authorities having jurisdiction over safety-related matters involving the project or the work.

(c) Contractor's responsibility for safety is not intended in any way to relieve of their own contractual and legal obligations and responsibility for (i) complying with all legal Requirements, including those related to health and safety matters, and (ii) taking all necessary measures to implement and monitor all safety precautions and programs to guard against injuries, loses, damages or accidents resulting from their performances of this work.

(d) The contractor shall arrange for the safety in his operation as required including the provisions in the safety manual published by the Central Water & Power Commission, New Delhi (January 1962 edition). In case the contractor fails to make such arrangements, the Engineer-in-charge shall be entitled to cause them to be provided and to recover the cost thereof from the contractor.

For failure to comply with the provisions of the safety manual the contractor shall without prejudice to any other liability, pay to Client/Corporation a sum not exceeding Rupees one hundred per day for each day of default.

4.9 **Selection of plant &equipments:**

The contractor is responsible for selection suitable dredger, plants and equipments that operate within the constraints of the project requirements. Selection of plant shall consider:

(a) Operating with other vessel traffic within the waterway.

(b) Dredging to the design depth and profiles at all water levels of the reservoir / river.

(c) Materials expected to be encountered.

(d) Productivity rates that consider the contract duration and allowable working time.

(e) Transporting the dredged spoil to the nominated disposal or nourishment area.

(f) Environmental Consideration

(g) Profiling the spoil to the design requirements.

4.10 **Daily Dredging Logs:**

The contractor shall provide a log with the following information at the completion of dredging each day.

(a) Date

(b) Dredged area

(c) Weather condition

(d) Start and stop times for vessel relocation and positioning.

(e) Start and stop time for production dredging.

(f) Start and stop time for stand by (with reasoning for standby)

(g) Estimated production.

4.11 **Infill:**

In fill caused by the following events is at the contractor's risk.

(i) Siltation processes due to storm water in flows, currents, wave action, tidal processes and water course hydraulics.

(ii) Slumping and deteriorating of the batters.

(iii) Local Disturbances.

(iv) Movement of vessels (including the dredge, dredge support vessels and other vessels using the waterway or water course)

4.12 **Removal of Plant:**

Dredge plant shall not be removed from the site until the post-dredger survey has confirmed that the minimum dredging depth has been attended throughout the area. Areas which do not attain minimum design depth shall be re-dredged to the required depth and shall be resurveyed.

4.13 **Inspection and Tests:**

The inspection of the works shall be carried out to check whether the work are in Conformity with the technical specifications attached to the contract and shall be in line with the inspection / test procedures laid down in the schedule of specifications and the contract Conditions.

Contractors must have suitable facilities at their work site for carrying out various performance tests on the equipment.

All tests shall be carried out as per OPWD norms if the same has not been specifically mentioned in the bid documents.

4.14 **Insurance:**

Without limiting his obligations and responsibilities, the contractor shall prior to the commencement of work insure in the joint names of the corporation and the contractor against all loss or damage from whatever cause arising, other than the risks for which he is responsible under the terms of the contract and in such manner that the Corporation & Contractor are covered for the period stipulated for loss of damage arising from a cause, occurring prior to the completion of services and for any loss or damage occasioned by the Contractor in the course of any operations carried out by him for the purpose of complying with his obligations under the Contract.

i. The works for the time being executed to the estimated current contract value thereof plus 10% thereon to allow for any additional costs and professional fees resulting from the loss or damage.

ii. The constructional plant and other things brought on to the site by the contractor to the replacement value of such constructional plant and other things.

It shall be the responsibility of the contractor to notify the insurer of any change in nature and extent of the work and to ensure the adequacy of the insurance cover at all times in accordance with the provisions of this clause.

Such insurance shall provide for compensation to be payable in the types and proportions, of currencies needed to cover the loss of damage incurred.

In case the contractor fails to ensure as stipulated above a deduction @0.25% of the contract value shall be made from the 1st interim payment made to him. Such shall be effected with an insurer and in terms approved by the Corporation, whose approval shall not be unreasonably withheld and the contractor shall whenever, required, produce to the Engineer or the Engineer's representative the policy or policies of insurance and the receipts for payment of the current premiums.

4.15 **Dredging work:**

The scope of work envisages performance of dredging works of about **3,03,528.00** Cubic meters from the river bed or at any other places to be identified by the Engineer-in-charge. The dredging works has to be carried out with suitable Dredger(s) as approved by the client.

4.16 **Method of Execution:**

The contractor shall arrange dredger, manpower, P.O.L., spare parts etc. and shall execute the dredging work and weed harvesters. The contractor shall also maintain the dredgers and pipelines and other accessories in good condition during the performance at his own cost.

4.17 **Rate of output:**

The contractor shall operate the dredgers in one or more shifts to achieve the target as per milestone.

4.18 **Hydrographic survey before & after dredging:**

Before commencement of work, during execution and after completion of dredging, the area shall be surveyed jointly by the Engineer-in-Charge, officers from water Resources Department, Government of Odisha and the contractor. The corporation may avail the service of Department of Ocean Engineer, Indian Institute of Technology Madras, Chennai or any third party authorized agency on hiring for conducting such survey and evaluation of quantity executed and certify for payment of Running Account bill and also final bill etc. The payment made by the Corporation to IIT Madras, Chennai or any third party authority for such survey shall be recovered from the bills of the contractor @ Rs.25000.00 per day of survey plus GST or as fixed by OCCL as per their bill claimed for such survey. The rates of contractor should be quoted by the inclusive of above survey or consultancy charges.

4.19 **Payment for Dredging:**

Payment for dredging works shall be made based on the output achieved in dredging in cubic meters as per contract rate of bill of quantities.

Payments for dredging work will normally be made to the contractor at monthly intervals.

Dredging work will be assessed on pre-level and post- level C.S Sheets.

For monthly payments the Contractor shall submit his bills for work accomplished and measured to Engineer-in-Charge on or before the last date of month. The Engineer-in-Charge shall thereafter verify the claim in the bill and as far as possible, arrange for payment to be made within 15 days of preparation of bill.

On completion of the entire work, the Contractor will submit his final bill. Payment of this bill shall not be considered conclusive evidence as to the sufficiency of any work or materials or correctness of measurements to which relates, nor shall it relieve the Contractor from his liabilities from any defects.

All interim payments shall be treated as advance payments. All payments will be made by Cheque or RTGS on request by the contractor.

4.20 **Measurement:**

Before start of execution of dredging, the survey for taking initial level shall be done by jointly by the Engineer-in-charge, Department, and Contractor. The corporation may avail the service of Department of Ocean Engineer, Indian Institute of Technology, Chennai or any third party authorized agency on hiring for conducting such survey. The level of the ground underwater shall be recorded by means of Echo-sounding equipment using dry proper method / hydrographic method. The contractor shall arrange necessary equipment, manpower for taking such Echo-sounding levels at his own cost and risk. On completion of the surveys, the contractor of the work shall prepare and record / drawing, which shall be signed by the contractor and the Engineer-in charge of work and these drawing, shall be used for measurement.

At the beginning and the end of each day at work soundings a bar check will be taken on the Echo-sounding machine. Also check sounding with flat bottom load sinker will be taken at the beginning and at the end of each days work. If the results of these checks are in the opinion of the Engineer-in-Charge not satisfactory, dredging shall be carried out again to the satisfaction of the Engineer-in-Charge.

The Pre & post dredging surveys as stated above shall be carried out under the supervision of Engineer-in-Charge or his nominee. Sounding boat/ survey launch, survey equipments,

qualified survey personnel etc. required for conducting pre & post dredging shall be supplied by the contractor at his own cost. Recording type digital Echo sounding having 0.1m accuracy for depth measurement and GPS / DGPS / RTKS, GPS having sub-meter accuracy for position fixing shall be used for survey purpose. Auto meter Hydrographic survey system using HYPACK may be used in survey work. However, keeping in view the site condition and practicability, the Engineer-in-Charge decides upon the method of survey to be adopted during measurement of quantity.

Any alternative method of measurement will be acceptable on mutual agreement.

4.21 **Limits of tolerance for dredging:**

The tolerance allowable in width shall be (+) 300 mm in each side from C/L of the river and that in depth (+) 100 mm from the specified depth. Quantity on account of depth exceeding (+) 100 mm and width exceeding the specified tolerance limit will not be considering for payment. In any stretch of dredged channel, if this depth or width is less than the specified limits, the Engineer-in-Charge will examine the short comings keeping in view the requirement and his decision to accept the work done or to order re-dredging of the river shall be final and binding on the contractor.

4.22 **Shifting of Dredger:**

No shifting charges will be paid to the contractor for shifting the dredger and its accessories from one area of river to another area of river.

4.23 The contractor shall arrange the transits, buoys lights, mooring etc at their own cost as required for dredging and also for cautioning other vessels in the waterway.

4.24 The Engineer-in-Charge or his representative will inspect, co-ordinate, measure and certify the dredging work. He has the right to inspect at any time during the contract period for which contractor's authorized agent shall be available at site during such inspection.

4.25 The contractor shall provide the boat from shore to dredger and back to shore during inspection and supervision by the Engineer-in-charge or his representative.

4.26 If the contractor's personnel or any outside labour employed to work during execution of contract, breaks or damages / destroys any vessel, craft, net, fishing stakes etc, building, road, kerb, water pipe, fence, bund, wires, trees, crop, fruit or cultivated ground during the period of agreement, the same shall be made good by the contractor at his own expenses or in default the OCCL may cause the same to be made good by other sources and deduct the expenses from any sums that may be then or at any time thereafter may become due to the contractor.

4.27 The rate of dredging quoted will include all the charges to be paid to the contractors by the authority. The rate quoted shall include all taxes, duties, and any other levies but excluding GST which will be paid extra as applicable. No additional payment on any such account shall be payable by OCCL. No extra charges will be paid to the contractor towards idle charge of the dredger during the monsoon period or blocking of dredger during working or on any ground.

4.28 The right to award, split up work or to reject the offer without assigning any reason is reserved with the authority. Authority could also ask any tenderer to carry out dredging on more than one location.

4.29 The contractor will submit to OCCL a bill in duplicate for dredging, corresponding to a length / quantity acceptable to the Engineer-in-charge which could be decided after the Pre-dredging survey depending on length to be dredged.

4.30 Contractor is fully responsible for solving the disputes with the local on account of dredging and disposal. The authority shall not be responsible for solving the disputes related to execution of the dredging. However on request, OCCL may extend the assistance for solving the issues only through the concerned officials / Department of the state or local bodies.

4.31 The contractor shall be responsible for finding out the dumping area in consultation with officials of Water Resources Department & OCCL. Any arrangement with respect to the bund around the identified dumping area is to make by the contractor at his cost.

4.32 **Final Measurement:**

The final quantities shall be computed from the agreed drawing recording the original ground and river bed levels after excavation and dredging has been completed. For the purpose of completing the quantity of dredging materials, Simpson's method shall be adopted. **The area of sections shall be calculated by Simpsons rule on ordinates spaced not more than 5 meters and the volume using areas of cross sections not more than 30 meters apart.** The actual spacing of ordinates for areas and sections for volume to be adopted in each case shall be determined by the Engineer-in-Charge of work.

4.33 **Inspection:**

The corporation, client and any person authorized by them shall at all times have access to work site when dredging work is being carried out or where the spare parts and materials in connection with dredging work are being obtained / store by the contractor. The contractor shall offer every facility & every assistance in/or obtaining the right of entry into such areas.

The bidder has to collect all the information required for bidding purpose at his own cost and risk. The bidder shall also be deemed to have inspected and examined the site and its surroundings and gathered available information in connection therewith and to have satisfied himself, so far as practicable before submitting his bid, as to the form and nature thereof including the bed conditions, the hydrographic and climatic conditions, the extent and nature of work and materials necessary for the completion of the works, the means of access to the site and the accommodation he may require and in general shall be deemed to have obtained all necessary information, subject as above mentioned, as to risks contingencies and all other circumstances which may influence or affect his bid.

4.34 Works to be done to the satisfaction of the Engineer:

The contractor shall execute and maintain the works in strict accordance with the contract to the satisfaction of the Engineer and shall comply with and adhere strictly to the Engineer's instructions and directions on any matter whether mentioned in the contract or not, touching or concerning the works. The contractor shall take instructions and directions only from the Engineer or from the Engineer's representatives(s).

4.35 **Watching and lighting:**

The contractor shall in connection with the works provide and maintain at his own cost all lights, guards fencing and watching when and where necessary or required by the Engineer or the Engineer's representative, or by and duly constituted authority, for the protection of the works, or for the safety and convenience of the public or others.

4.36 **Suspension of works:**

The contractor, shall on the written order of Engineer, suspend the progress of the work or any part thereof for such time or times in such manner as the Engineer may consider necessary and shall during such suspension properly protect and secure the work, so far as is necessary in the opinion of the Engineer. The extra cost incurred by the contractor in giving effect to the Engineer's instruction under this Clause shall be borne by the contractor.

4.37 **Contractor's superintendence and supervision:**

The contractor shall provide all necessary superintendence during the execution of work and as long thereafter as may be necessary for the proper fulfilling of the contractor's obligations under the contract. The contractor or a competent authorized agent or the representative approved in writing by the Engineer, which approval may at any time be withdrawn, is to be constantly on the work and shall give his whole time to the superintendence of the same.

The contractor shall provide and employs sufficient number of qualified men for supervision on all aspects of work.

(i) Only such technical assistants as are skilled and experienced in their respective callings and sub-agents, foremen and leading hands as are competent to give.

Proper supervision to the work is required to supervise and (ii) such skilled, semi-skilled and unskilled labour as is necessary for the proper and timely execution and maintenance of the work.

4.38 **Removal of contractor's men:**

If approval shall be withdrawn by the Engineer, the contractor, shall as soon as is practicable, having regard to the requirement of replacing him as hereinafter mentioned, after receiving written notice of such withdrawal, remove the agent from the works and shall not thereafter employ him again on the works in any capacity and shall replace him by another agent approved by the Engineer such authorized agent or the representative shall receive, on behalf of the contractor, directions and instructions and from the Engineer or the Engineer's representative.

4.39 **Programme of works:**

The contractor as approved by the Engineer shall carry out the programme of dredging. The contractor is required to prepare & submit a detail deployment schedule and method statement for the dredger along with the capacity proposed to be dredged on weekly, monthly basis. The contractor shall commence the work on site within the period mentioned after the receipt by him of a written order to this effect from the Engineer and shall proceed with the same with the expedition and without delay except as may be expressly sanctioned or ordered by the Engineer, or by wholly beyond the contractor's control.

The contractor shall bear all costs and charges for special or temporary way leases required by him in connection with access to the site. The contractor shall also provide at his own cost any additional accommodation outside the site required by him for the purpose of the work.

4.40 **Documents mutually explanatory:**

Except otherwise stated specifically in this contract, the documents forming the contract shall take precedence in the order in which they are set out in the form of the agreement. Subject to the foregoing, the several documents forming the contract are to be taken as mutually explanatory of one another, but in case of ambiguities or discrepancies, the same

shall be explained and adjusted by the Engineer who shall thereupon issued to the contractor instructions thereon, provided always that if in the opinion of the Engineer, compliance with any such instructions shall involve the contractor in any cost, which by reason or any such ambiguity or discrepancy could not reasonably have been foreseen by the contractor, the Engineer shall certify and the Corporation shall not pay such additional sum as may be reasonable to cover such cost as the rate of the Contractor including all above costs.

4.41 **Plans and drawings:**

The contractor shall submit the following information in triplicate to the Engineer-in-charge for approval within the time stipulated against each item below.

Drawings showing the location or major plant and other facilities which he proposes to put up at the site, including and changes in the general layout, at least fourteen days prior to the commencement of the respective work.

4.42 **Reference makes and bench marks:**

The basic centre lines, reference points and benchmarks shall be fixed in consultation with the Client/Corporation. The contractor shall establish at his own cost, at suitable points, additional reference lines and bench marks as may be necessary. The contractor shall remain responsible for the sufficiency and accuracy of all his benchmarks and reference lines. He shall take precautions to see that the lines, points and bench marks fixed by the Client/Corporation are not disturbed by his worm and shall make good any such damage.

4.43 **Information and data:**

The information and data furnished herein relative to the works and site conditions are general. It shall be the responsibility of the contractor to fully acquaint himself with the nature and the location of works, quarries, local conditions and other aspects, which are relevant to the work.

4.44 **Use and care of site:**

The contractor will be permitted to use with charge, available with the Client/Corporation the site and the lands for execution of work, labour, staff, colonies, site offices, workshops or stores and for related activities. The contractor shall not commence any operation on such lands except with the approval of the Engineer-in-charge. If these lands are not adequate, the contractor may have to make his own arrangements for additional lands. The contractor shall not demolish, remove or alter the structures, trees or other facilities on the site without prior approval of the Engineer-in-Charge.

All the areas of the contractor's operations shall be cleaned before returning them to the Client/Corporation. The contractor shall make good any damage or alterations made to area, property or land handed over to him before these are returned.

4.45 **Protection of adjoining premises:**

It shall be accepted as an inseparable part of the contract that in matters regarding materials, workmanship, removal of improper works, interpretation of the contract drawing and contract specification, mode or procedure of carrying out of the work the decision of the Engineer-in-Charge which shall be given in writing, shall be binding on the contractor.

The Engineer-in-charge's authority applies to technical considerations a does not include decisions regarding sums due to or from the contractor or extension of time.

4.46 **Engineer-in-Charge's decision:**

It shall be accepted as an inseparable part of the contract that in matters regarding materials, workmanship, removal of improper works, interpretation of the contract drawing and contract specification, mode or procedure of carrying out of the work the decision of the Engineer-in-charge which shall be given in writing, shall be binding on the contractor.

The Engineer-in-charge's authority applies to technical considerations and does not include decisions regarding sums due to or from the contractor or extension of time.

4.47 **Other contractors:**

When two or more contractors are engaged on work in the same vicinity, they shall work together in a spirit of co-operations and accommodation. In case of any difficulties amongst the contractors the Engineer-in-charge shall direct the manner in which each contractor shall conduct his work so far as it affects the others. Contractor's operation shall be so planned as to prevent any damage to the working area of neighboring contractor. If due to any act of the contractor damages occurs to the neighboring contractor then the compensation to the damage to be borne by the defaulting contractor. If settled mutually, the decision of Engineer-in-charge shall be final and conclusive and binding on concerned contractor.

4.48 **Other workmen:**

The Engineer-in-charge shall have full authority to depute other workmen on the work site to execute other works not included in the contract.

4.49 Notwithstanding anything contained herein, the Engineer-in-charge may take such actions as may be necessary for compliance of the various labour laws and recover the costs thereof from the contractor.

4.50 In the event of the contractor committing a default or breach of any of the provisions of the labour laws and rules and regulations as applicable, the contractor shall without prejudice to any other liability under the acts pay to Client/Corporation a sum not exceeding rupees one hundred per day for each day of default subject to a maximum of one percent of the contract amount.

4.51 It will be exclusive responsibility of the contractor to provide Drinking Water supply to their staff at site of work.

4.52 In case power supply is required at work site or at his camp office, staff colony etc., they may avail it by directly making necessary agreement with Electricity supply agency and pay the charges thereof, at their own cost and risk.

SECTION - 5

STEEL REINFORCEMENT

5.1 GENERAL

a. The section covers specifications for providing steel reinforcement to Dams/barrages, ancillary works & other structure and the contractor has to make his own arrangements for the procurement of tested mild steel and H.Y.S.D. Bars required for the work only from the reputed manufacturers. Necessary I.S.I. test certificates are to be produced to Engineer before use in work. Steel bars shall be stored in such a way as to avoid distortion and to prevent deterioration by corrosion. The Contractor shall make his own arrangements for transportation and storage.

b. High yield strength deformed bars shall conform to I.S:1786-1985,

The diameter and weight of plain and HYSD steel bars shall be as follows.

Sl. No	Diameter of rod	Sectional weight in Kilogram per running meter both for plain and HYSD steel.
1	6 Millimeters	0.22
2.	8 Millimeters	0.39
3.	10 Millimeters	0.62
4.	12 Millimeters	0.89
5.	14 Millimeters	1.21
6.	16 Millimeters	1.58
7.	18 Millimeters	2.00
8.	20 Millimeters	2.47
9.	22 Millimeters	2.98
10.	25 Millimeters	3.85
11.	28 Millimeters	4.83
12.	32 Millimeters	6.31
13.	36 Millimeters	7.99
14.	40 Millimeters	9.86
15.	42 Millimeters	10.88

NOTE : If any rods other than those specified above are used, the weights shall be as per standard steel tables.

c. The work shall consist of shaping and placing reinforcement in conformity to the shape and dimensions shown on the drawings and as specified in the specifications, including cutting, bending, clearing, wedging, placing, binding and fixing in position. A list of IS codes applicable is furnished below:

List of IS Codes:

IS:456-1978/2000	Code of practice for plain and reinforced concrete
IS:1786-1985	Specification for High strength deformed steel bars and wires for concrete reinforcement.
IS:432-1982(Part-I)	Specifications for mild steel and medium tensile steel bars for concrete reinforcement and hard drawn steel wire.
IS-280-1978	Mild steel wire for general engineering purposes.
IS-2502-1963	Code of practice for bending and fixing of bars for concrete reinforcement.
IS:9417-1989	Recommendations for welding cold worked bars for reinforced concrete construction

IS:2751-1979	Welding of mild steel plain and deformed bars for reinforced construction
IS:814-1991	Covered electrodes for manual metal arc welding of carbon and carbon manganese steel.
IS:1278-1972	Filer rods and wires and gas welding.

In addition to the above Indian Standard codes, the specifications of OSS and manual for quality control and inspection shall also be complied with.

5.2 Material

i. a. Steel shall be clean and free from loose rust or loose mill scale and other objectionable foreign substances at the time of fixing in position and subsequent concreting. The fact that early stage rust has no detrimental effect on bond shall not be used as excuse of careless handling and storage of steel.

b. The contractor shall procure high yield strength deformed bars, conforming to IS:1786-1985.

c. The reinforcement bars used by the contractor shall be in accordance with the Section 5.1.

ii. Cutting, Bending and binding of reinforcement.

a. Reinforcement steel shall conform accurately to the dimensions given in the bar bending schedules shown on relevant drawings.

b. Bars shall be bent cold to the specified shape and dimensions by a bar bender by hand or power to attain proper radius of bends as shown in drawings or as directed by the Engineer. Heating of reinforcement bars to facilitate bending will not normally be permitted. When, however, such heating is permitted in the case of large diameter bars, the temperature of the steel shall not exceed the temperature corresponding to a cherry red colour.

c. Bars shall not be bent or straightened in a manner that will injure the material

d. Bars bent during the transport or handling shall be straightened before being used on work, they shall not be heated to facilitate bending.

5.3 Placing of reinforcement.

a. Before the reinforcement is placed, the surface of the bars and the surfaces of any metal bar supports shall be cleaned of the rust, loose mill scale, dirt, grease and other objectionable foreign substances.

b. All reinforcing bars shall be accurately placed in exact position shown on the drawing, and shall be securely held in position during placing of concrete by annealed binding wire, and by using stays, blocks or metal chairs, spacers, metal hangers, supporting wires or other approved devices at sufficiently close intervals so that they will not sag between supports, nor be displaced during concreting or by any operation of the work.

c. Wire for binding reinforcement shall be soft and annealed mild steel of 16 SWG and shall conform to IS:280-1978.

d. The contractor shall also ensure that there is no disturbance caused to the reinforcing bars already placed in concrete.

e. All devices used for positioning shall be of non-corrodible material. Metal supports shall not extend to the surface of the concrete, except where shown on the drawings. Pieces of broken

stone or brick and wooden blocks shall not be used. Where portions of such supports will be exposed on concrete surfaces designated to receive F2 or F3 finish, the exposed portion of support shall be galvanized or coated with other corrosion resistant material without which the concreting will not be permitted. Such supports shall not be exposed on surfaces designated to receive F4 finish unless otherwise shown on the drawings.

f. Placing of reinforcement bars on layers of freshly laid concrete, as work progresses, for adjusting bar spacing shall not be allowed.

g. Layers of bars shall be separated by spacer bars, pre-cast blocks or other approved devices.

h. Reinforcement after being placed in position shall be maintained in a clean condition until completely embedded in concrete. Special care shall be taken to prevent any displacement of reinforcement in concrete already placed.

i. To protect reinforcement from corrosion, concrete cover shall be provided as indicated on the drawings. All bars protruding from concrete and to which other bars are to be spliced and which are likely to be exposed for an indefinite period shall be protected by a thick coat of neat cement grout.

j. Bars crossing each other, where required, shall be secured by binding wire (annealed) or size not less than 1mm dia and conforming to IS:280-1978 in such a manner that they do not slip over each other at the time of fixing and concreting.

k. As far as possible, bars of full length shall be used. In case this is not possible, overlapping of bars shall be done as directed by Engineer-in-Charge. When practicable, overlapping bars shall not touch each other, but be kept apart by 25 mm or 1 ¼ times the maximum size of the coarse aggregate which is greater, by concrete between them. Where not feasible, overlapping bars shall be bound with annealed steel wire, not less than 1mm thickness twisted tight. The overlaps shall be staggered for different bars and located at points, along the span where neither shear nor bending moment is maximum.

l. The minimum allowable clearance between parallel round bars shall not be less than 1 ½ times the diameter of the large bars and for square bars shall not be less than twice the side dimensions of the larger bars or 1½ times the maximum size of aggregate, whichever is greater.

m. Dissimilar diameter rods should not be joined together.

5.4 Splicing

a. Where it is necessary to splice reinforcement, the splices shall be made by lapping or by welding or by mechanical means.

When permitted or specified on the drawings, joints of reinforcement bars shall be butt welded so as to transmit their full strength. Welding of bars shall be done as directed by the Employer and conforming with requirements of clause 11.4 of IS: 456-1978.

If it is proposed to use welded splices in reinforcing bars, the equipment, the material and all welding and testing procedures shall be subject to the approval of the Employer. The contractor shall also carryout test welds as required by the Employer. No extra rate will be paid for welding reinforcement and test-welds, as bid price is inclusive of this item.

For welded splices for reinforcing bars conforming to IS: 1786-1985 welding shall be done in accordance with IS: 9417-1979. For reinforcing bars conforming to IS: 432(PartI)-1982 welding shall be done in accordance with IS: 2751-1979. Electrodes for manual metal arc welding shall conform to IS: 814(Part-I)-1974 and IS: 814(Part-II)-1974. Mild steel filler rods for Oxy-acetylene welding shall conform to IS: 1278-1972, provided they are capable of giving a minimum butt weld tensile strength of 41 Kg/mm^2.

Only electric arc welding using a process which excludes air from the molten metal and conforms to any or all other special provisions for the work shall be accepted. Suitable means shall be provided for holding the bars securely in position during welding. It must be ensured that no voids are left in welding and when welding is done in two or three steps, previous surfaces shall be cleaned well. Ends of bars shall be cleaned of all iron scale, rust, grease, paint and other foreign matter before welding.

b. Reinforcing bars of 28 mm in diameter and larger may be connected by butt welding provided that lapped splices will be permitted if found to be more practical than butt welding and if lapping does not encroach on cover limitation or hinder concrete or reinforcement placing.

c. Reinforcing bars 25mm in diameter and less may be either lapped or butt welded, whichever is the most practicable.

Butt welding of reinforcing bars shall be performed either by the gas pressure or flash pressure welding process or by the electric arc methods under cover from weather.

Welded pieces of reinforcement shall be tested at the rate of 0.5% of total number of joints welded. Specimen shall be taken from the actual site of work. Strength of the weld provided shall be at least 25% higher than the strength of bars.

d. Welded joints or splices shall preferably be located at points where steel will not be subject to more than 75% of the maximum permissible stresses and welds so staggered that at any section not more than 20% of rods are welded. Approval of such additional splices will generally be restricted to splices not closer than 8 metres in horizontal bars or 4 meters in vertical bars measured between mid point of laps.

5.5 Coupling of bars.

Wherever indicated on the drawings or desired by the Engineer-in-Charge to use mechanical couplings for reinforcing bars, bars shall be joined by couplings which shall have a cross sections sufficient to transmit the full strength of bars. The ends of bars that are joined by couplings shall be upset for sufficient length, so that the effective cross section at the base of threads is not less than the normal cross section of the bars. The threads shall be standard with worm threads. Steel for couplings shall conform to IS:226. The contractor shall submit samples of the proposed coupling to the Engineer for approval not less than 60 days prior to their proposed use.

5.6 Care of placed reinforcement and concrete

Where reinforcement bars at construction joints and afterwards are bent back into their original position, care shall be taken to ensure that at no time the radius of the bend is less than 6 x diameter for deformed bars and 4 x diameter for plain mild steel bars. Care shall also be taken, when bending such bars, to ensure that the concrete around the bars is not damaged.

As specified in clause 11.3 of IS: 456-1978 unless otherwise specified by the Engineer-in-Charge, reinforcement shall be placed within the following tolerances.

i. For effective depth 200 mm or less = $\pm$ 10mm

ii. For effective depth more than 200mm = $\pm$ 15mm

The cover shall in no case be reduced by more than one third of specified cover or 5mm whichever is less.

a. The dowels shall be of the same HYSD bars of grade F2 415 conforming to IS: 1786-1985 as used for reinforcement

b. Details for dowels shall be as shown on the drawings or as directed by the Engineer-in-charge.

c. Dowels shall be placed in the concrete where shown on the drawings or where directed and will be inspected for compliance with requirements as to size, shape, length, position and quantity after they have been placed but before being covered by concrete.

d. Before the dowels are embedded in concrete, the surfaces of dowels shall be cleaned of all dirt, grease or other foreign substances which in the opinion of the Engineer are objectionable.

e. The dowels shall be accurately placed and secured in position so that they will not be displaced during the placing of the concrete.

5.7 INSPECTION BEFORE CONCRETING :

No concreting shall be started unless the reinforcement as laid is finally checked and certified by the Engineer-in-charge or his authorized representative, Before starting the concreting the contractor shall make certain that the measurements of the reinforcement placed in have been recorded and that the Engineer-in-charge certifies corrections of reinforcement used. Failure to do so may mean no payment or payment at the discretion of the Engineer-in-charge for the reinforcement concrete.

SECTION – 6

CONCRETE

(Excluding Framework, Reinforcement and Joints)

6.1 SCOPE OF WORK

(1) The work under this section includes all concrete works in Dams, Spillways, Head Regulators & other structure etc. covering the ingredient materials, testing and services related to the concrete work to be carried out by the contractor under this contract.

(2) The concrete work shall be performed to the dimensions as shown on the construction drawings or as otherwise directed by the Engineer-in-charge. Lift drawings for each pour showing all embedment, lines and levels shall be prepared by the contractor.

(3) The contractor shall cooperate with all other contractors and organizations related to the construction of permanent works where the materials or equipment is to be fixed to or embedded in the concrete structures.

(4) Form work, reinforcement and concrete are covered separately in other sections of this specification.

(5) The approval given by the Engineer-in-charge to the contractor's plants and equipment or their operation or of any construction methods shall not relieve the contractor of his full responsibility for the proper and safe execution of concrete work or any obligations under this contract.

6.2 STANDARDS

1) Unless otherwise specified, the standard and recommendations of Indian Standards Code of Practices shall be followed in respect of all materials, equipment and performances.

2) The following Indian standards are specifically mentioned.

1. IS: 269-1976 Ordinary and low heat Portland cement (third revision) (with amendment No. 1 to 5)
2. IS: 383-1970 Coarse and fine aggregates from natural sources concrete (second revision) (Reaffirmed 1980)
3. IS: 456-1978 Code of practice for plain and reinforced concrete (third revision) Amendment No.1
4. IS: 455-1976 Portland slang cement (third revision) (with amendment No. 1 to 5)
5. IS: 457-1957 Code of practice for general construction of plain and reinforced concrete for dams and other massive structures.
6. IS: 460-1985 Test Sieves Part 1 to 3
7. IS: 516-1959 Methods of test for strength of concrete (with amendment No.1)
8. IS: 650-1966 Standard sand for resting of cement (first revision) (with amendments No. 1 & 2) (Reaffirmed 1980)
9. IS: 883-1970 Code of practice for design of concrete member in bulking (Third Revision)
10. IS: 1999-1959 Methods of sampling and analysis of concrete
11. IS: 1489-1976 Portland pozzolana cement (Second revision) (with amendments No 1 to 5)
12. IS: 1791-1985 General requirements for batch concrete mixers (Second revision)
13. IS: 2506-1985 General requirement for concrete vibrator screed board type (first revision)
14. IS: 2722-1964 Portable swing weigh batchers for concrete (Single and double bucket type.
15. IS: 3085-1965 Methods of test for permeability of cement mortar and concrete (Re-affirmed 1980)
16. IS: 3558-1983 Code of practice for use of immersion vibrators for consolidating concrete (first revision)
17. IS: 3873-1978 Code of practice of laying in-situ cement concrete lining on canals (First revision)
18. IS: 4031-1968 Methods of physical tests for hydraulic cement (Reaffirmed 1980)

19.	IS: 4032-1985	Method of chemical analysis of hydraulic cement (first Revision)
20.	IS: 4656-1968	Form vibrators for concrete
21.	IS: 4845-1968	Definition and terminology relating to hydraulic cement (Reaffirmed 1980)
22.	IS: 4634-1968	Method for testing performance of batch type concrete mixers
23.	IS: 4925-1968	Concrete batching and mixing plant.
24.	IS: 4926-1976	Ready-mixed concrete (first revision)
25.	IS: 5512-1983	Flow table for use in tests of hydraulic cement and pozzolanic materials (first revision)
26.	IS: 5513-1976	Vicat apparatus (first revision with amendment No.1)
27.	IS: 5515-1983	Compacting factor apparatus (first revision)
28.	IS: 5640-1970	Method of test for determination of aggregate impact value of soft coarse aggregate
29.	IS: 5816-1970	Splitting tensile strength of concrete – Method of Test
30.	IS: 5889-1970	Vibratory plate compactor (with amendment No.1)
31.	IS: 5829-1970	Concrete transit mixers and agitators.
32.	IS: 6461 Part I to XII	Glossary of terms relating to cement concrete
33.	IS: 6923-1973	Method of test for performance of screed board concrete vibrator.
34.	IS: 6925-1973	Method of test for determination of water soluble chlorides in concrete admixtures.
35.	IS: 7245-1974	Concrete pavers.
36.	IS: 7320-1974	Rapid hardening Portland cement (first revision with amendment No.1 & 2)
37.	IS: 7861 Part 1 &2	Code of practice for extreme weather concreting
38.	IS: 8043-1978	Hydrophobic Portland cement (first revision with Amendments No. 1 & 2)
39.	IS: 8112-1967	High Strength Ordinary Portland Cement (with amendments No. 1 to 4)
40.	IS: 8142-1978	Method of test of determining setting time of concrete by penetration resistance.
41.	IS: 8989-1978	Safety code for erection of concrete framed structures.
42.	IS: 9017-1978	Method of making curing and determination of compressive strength of concrete test specimens.
43.	IS: 9077-1979	Code of practice for corrosion protection of steel reinforcement in RB & BCC Construction.
44.	IS: 9103-1979	Ad mixtures of concrete
45.	IS: 9284-1979	Method of test for abrasion resistance of concrete
46.	SP: 16 (S & T)	Design aids for reinforced concrete to IS: 456-2000

In addition to the above relevant Indian Standard following other publications shall also apply in case of wanting specification Indian Standard.

Other Publications :

1. USBR Concrete Manual (Eight edition revised print 1981)
2. ASTM C-156-80 water retention test.
3. ASTM C-30981 Type-2 Liquid membrane – Forming compound for curing concrete.
4. ASTM C-491-90 Water reducing agents
5. ASTM C-494 – Type D water reducing agent and set retarder.
6. ASTM E-97 light reflectance test.
7. IRC codes Standard specifications and code of practice for Road bridges (Section-I, II, III, VII etc)
8. Govt. of Odisha quality control and field instruction manual (1989) I & P Dept.

Other BSI codes relevant to the work, but not mentioned above, shall also be followed.

6.3 SUBMITTALS

6.3.1 Submittals Before Construction

1) Submittals listed herein are related to items, which require the consent of the Engineer-in-charge and are to be submitted by the Contractor before the appropriate work may proceed.

2) Within 28 days from the date of issue of Notification of Award, but before procuring or mobilizing to the site the equipment, the contractor shall submit to the Engineer-in-charge updated and detailed plans and descriptions, consistent with those submitted with his Tender and any subsequent amendments and additions agreed to by the Engineer-in-charge and the contractor, including but not limited to the following:

   a) Aggregates Processing Plant:

      Description, flow diagrams and drawings in sufficient details to indicate layout, type and capacity of crushing, screening, washing, conveying and other aggregate processing and handling equipment.

   b) Batching Plant

      Description, flow diagrams and drawings of the plants, and details of the equipment the contractor intends to use, to determine and control the quantity of each separate concrete ingredient and mixing thereof into uniform mixture.

   c) Transport and Placing of Concrete.

      Full details of the equipment and methods for transporting the concrete from the concrete plant to the final point of placing including numbers, type and capacity of transport vehicles, concrete pumps, vibrators and details of standby plants to be installed.

      a) Mode and methodology of concrete compaction and concrete curing.

      b) Sampling and Testing of Materials: List and details of equipment of sampling and testing, detailed program for quality control of concrete work and qualification and experience of the proposed personnel.

      c) Foundation and surface preparation equipment.

3) At least 56 days in advance of any concrete work being carried out at the site, the contractor shall submit to the Engineer-in-charge following notifications based on the results of the preliminary material testing:

   a) Notification on the quantity of cement required, brand of cement to be used on approval of Engineer-in-Charge and the proposed schedule of shipment and storage.

   b) Notification of the source, analysis, method of delivery and storage of water for concrete manufacture.

   c) Notification of any admixtures which the contractor proposes to use, manufacturers thereof, and information about the chemical names of the principal ingredients and the effects of under or over dosage. Should the contractor intend to use an accelerator in any concrete work for his own convenience, he shall give full details of the type, dosage, influence on construction and the cost savings involved.

   d) Details of the materials for formwork and surface finishes, treatment of construction joints, and construction techniques which the contractor proposes to use in order to achieve the required concrete surfaces and allowable tolerances.

   e) Details of special additives like silica fume & steel fibres for production of high performance concrete.

   f) Details of curing methodology

6.3.2 Submittals During Construction

a. Contractor shall provide the Engineer-in-charge with a weekly placing schedule giving the detailed location of the pours, the approximate extent of pours, and the date on which the concrete will be placed. This weekly programme of concrete placement shall be submitted to the Engineer-in-charge for his acceptance at least 2 days prior to the commencement of the week.

b. Before commencement of the concrete placement the contractor shall prepare a checklist regarding all preparations for the specified work such as cleaning and treating rock surfaces and foundations, formwork, reinforcement, embedding, instrumentation and submit this list to the Engineer-in-charge, who after his satisfaction about the work preparations will permit the contractor in writing to commence concrete placement.

c. The contractor shall keep and make available to the Engineer-in-charge records of the date, quantity and storage location of each delivery and shall provide facilities for checking the stock of cement.

d. During the performance of the concrete work, the contractor shall keep a diary where he shall record the construction procedures related to concreting. This diary shall be made available to the Engineer-in-charge upon request. The records shall contain at least the following.

   1. Commencement and termination of concreting of various parts of the structures.
   2. Quantities and quality of aggregates and cement provided and the storage from which they were drawn.
   3. Temperature of air, water and concrete.
   4. Meteorological conditions

5. Sampling and testing performed and summary of results.
6. Personnel employed during various stages of the concreting operation and name of the responsible inspector or foreman.
7. Equipment used.

a. Any special material or procedures employed.

e. The Engineer-in-charge reserves the right to require any additional information deemed necessary to be included in the submitted documents.

6.4 CONSTITUENTS OF CONCRETE

6.4.1 Cement

i) Cement shall be ordinarily Portland cement conforming to IS:269 or low heat- low alkali Portland pozzolana cement (PPC) conforming to IS:1489 or Grade 43 conforming to IS:8112 or Grade 52 cement conforming to IS:12269 or Portland slag cement confirming to IS:455-1976 depending upon the use and type of structure.

ii) Cement, which does not comply with, relevant IS code or is damaged in consignment, handling or storage shall be promptly removed from the site.

iii) All facilities for transport and storage of cement shall be subject to approval of Engineer-in-charge and shall be such that easy access for inspection is assured.

iv) Bulk cement shall be transported from the port or factory to the site in adequately designed weather tight trucks, or other means where cement will be protected from exposure to moisture. Immediately upon receipt at the site, cement shall be stored in a dry, weather-tight and properly ventilated structure with adequate provisions for the prevention of absorption of moisture, and constructed in such a way that there will be no dead storage. The vents of the bins and silos shall be equipped with dust collectors to reduce loss of cement during handling and inconvenience to the personnel.

v) Cement bags shall be stored in weatherproof buildings with a raised, well-ventilated wooden floor, and placed so that each consignment can be segregated if required and used in order of its age. Bags shall not be stacked more than 1.5 m high. Cement shall not be stored outdoors, except for immediate use, and in such event shall be protected during storage and handling by waterproof covers and a raised floor. Unused cement shall be placed back into the storage buildings.

vi) Cement shall be preferably used in same order in which it has been received at the site. Storage of cement shall be limited to 45 days in bags and 90 days in bulk. Cement that has been in storage for longer than these periods or which may have absorbed moisture shall not be used unless it has been re-tested by the Contractor and approved by the Engineer-in-charge. Cement that has become lumpy shall not be used. The cements coming from different factories or of different makes shall be stored separately.

vii) The temperature of cement upon arrival to the Site shall not exceed 70^0C and when entering the mixers shall not exceed 50^0C unless otherwise approved.

viii) Fly ash (pozzolana) shall not be allowed to be mixed with cement at place other than factory/manufacturing unit. Fly ash (pozolana) mixed at factory shall conform to IS:3812 and IS:1344.

6.4.2 Aggregate

6.4.2.1 General

(1) Unless otherwise specified, concrete aggregates shall conform to the requirements of IS:456 and IS:383. They shall be tested in accordance with the provisions of IS:2386

(2) Aggregate shall consist of clean, hard, dense, durable and uncoated materials and shall have stable moisture content and grading when delivered to the batching plant. Aggregates shall not contain substances, which may impair the quality of the concrete, attack reinforcing steel or reduce bond. The following substances are regarded as being harmful; loam, clay, pieces with large cavities, foam-like or vitreous pieces and organic materials such as topsoil, roots, wood, coal, lignite etc. In doubtful cases the effects of harmful substances shall be established by tests.

(3) Use of aggregates containing minerals which can cause alkali reactivity beyond acceptable limits will not be permitted. Presence of such minerals in the stones will be determined by testing.

(4) The shape of the particles shall be generally spherical or cubical. The amount of flat or elongated particles shall not exceed 25% by weight. A flat or elongated particle is defined as one in which the width to thickness, respectively length to width ratio is greater than 3. Rock, which breaks down into such shape, regardless of the type of processing equipment used, will not be approved for use in the production of aggregates.

(5) The contractor shall make provisions for crushing and processing of material in accordance with recommendations contained in IS:383 to meet the gradation and other requirements of these specifications, in order to obtain the total amount of aggregate required for concrete manufacture. Crushing, screening and washing operations, beneficiation of aggregates and blending of crushed and natural aggregates shall at all time be subject to the consent of the Engineer-in-charge.

(6) The handling, transporting and stockpiling of aggregates shall be such that there will be a minimum amount of fines resulting from breakage and abrasion of material resulting from free fall and improper handling. Excess in any of fine or coarse aggregate sizes shall be disposed of in approved manner.

(7) The contractor shall remove all rejected aggregate from the site.

6.4.2.2 Fine Aggregates.

(1) The term 'fine aggregate' is used to designate aggregate in which the maximum size of particles is 4.75mm. Sand obtained from natural sources like river shall be used as fine aggregate. Fine aggregates shall be tested for their gradation, specific gravity, water absorption, fineness modulus, soundness, petrography analysis, deleterious constituent and alkali aggregate reactivity to assess the suitability.

(2) The gradation of fine aggregate shall conform to specifications of IS 383 and the sand shall not fall into grading zone I and IV.

(3) The percentage of deleterious substance in the fine aggregate shall conform to IS:383, except that the fine aggregate shall contain not more than 0.1% by weight of deleterious (reactive) ferrous sulphide. The total percentage of deleterious substance must not exceed 5% by weight.

(4) Fine aggregate having specific gravity of less than 2.6 shall be rejected. Fine aggregates, when subjected to soundness test with a solution of sodium sulphate, after five cycles of tests, shall not suffer a loss of weight in excess of 10 percent.

(5) Fineness modulus of fine aggregate shall be 2.1 to 3

(6) Fine aggregate, upon delivery to the batching plant, shall have uniform and stable moisture content. The Bulk age of sand shall be less than 20%.

(7) Sand shall be free from harmful quantity of organic impurities as per IS 2386 Part II. Sand that are producing a color (obtained by dissolving 9 grams of chemically pure Terric Chloride and 1 gram of CP Cobalt in 100 ml of water to which one-third ml of Hydrochloric Acid has been added) darker than the standard in the test (Organic test for organic impurities) shall be rejected.

6.4.2.3 Coarse Aggregates

(1) The term "coarse aggregate" is used to designate aggregate which is retained on sieve opening 4.75mm. The coarse aggregate shall be well graded and its gradation will be decided based on the laboratory tests to obtain dense mass of concrete. The gradation will be approved by the Engineer-in-charge before production of the concrete.

(2) The coarse aggregate shall be tested for gradation, specific gravity, water absorption, impact and abrasion values, soundness, spectrographic analysis, deleterious constituent, flakiness and elongation indices and alkali aggregate reactivity as per IS 2386-1963(Part I to VIII) and other relevant standards.

(3) Coarse aggregates shall be stored separately in stockpiles or bins in such a manner to avoid intermixing of different size of aggregates. The storing shall be done in following sizes.

5-10 mm 10-20 mm 20-40 mm 40-80 mm 80-150 mm

(4) The percentage of deleterious substance in the coarse aggregate shall conform to IS: 383 except that the coarse aggregate shall contain not more than 0.3% by weight of deleterious (reactivity) ferrous sulphide. The total deleterious material shall not exceed 5% by weight.

(5) Coarse aggregate shall have a loss not more than 40% as determined by Los Angeles Abrasion test as specified in IS:2386 (Part IV). However in extreme cases, because of non-availability of such aggregate in near vicinity the Engineer-in-charge may allow aggregates having this value as 50%.

(6) When subjected to sodium sulphate soundness test, course aggregate shall not suffer a loss of weight in excess of 12% after five cycles.

(7) Coarse aggregate shall be hard, dense, durable, nun coated rock fragments. Rock having an absorption greater than 3% or specific gravity less than 2.5 shall not be used.

(8) Aggregate delivered to the batching plant shall have uniform and stable moisture content.

6.4.2.4 The nominal maximum aggregate size in relation to the structure dimension shall be fixed as per IS 456 & IS 457 and as per the approved drawing. Coarse aggregate shall be well graded and shall conform to the grading specified in Table II of IS 383.

6.4.2.5 Aggregate storage.

(1) Aggregates shall be stored in a manner so that each size of aggregate is separate in free-draining piles in a manner that reduces breakage, deterioration, contamination and

segregation to a minimum. Each grade of aggregates is to be stored separately. Storage arrangements shall be subject to acceptance by the Engineer-in-charge.

(2) The Contractor shall maintain sufficient aggregate storage at the site at all times to permit continuous placement of concrete in accordance with the contractual time schedule.

(3) The moisture content of aggregates shall be controlled as far as practicable, by wetting the stockpiles and by adequate drainage. All aggregate shall remain in a free-draining stockpile for at least 12 hours prior to use. To minimize moisture variation, the height of the stock piles shall be kept 1.25m to 1.5m and the lowest layer of about 30cm height shall be used as drainage layer and not used till end. Fine aggregates of the bottom 30cm layer shall not be used for concrete.

6.4.3 Water

(1) A reliable and adequate water supply shall be installed and maintained by the contractor for washing of aggregates, manufacturing and curing of concrete The water shall be clean and free from harmful quantities of oil, acids, alkalils, sugar, salt, silt and other organic matters and shall conform to IS:456.

(2) Permissible limit of Solids in water shall conform to Table I of IS 456.Water shall contain not more than 200mg/l of organic,3000mg/l of inorganic, 400 mg/l of sulphates (SO_3), 500 mg/l of chlorides (Cl), and 2000mg/l of suspended matter.

(3) Adequate water storage shall be provided at the batching plant to ensure smooth concrete production.

(4) Contractor shall familiarize himself with source and quality of water available. Attention is drawn to the possible requirement of settling pond and other facilities that he may be required to provide.

6.4.4 Admixtures

(1) Admixtures shall be proposed by the contractor and shall be used only upon written approval of the Engineer-in-charge. Only admixtures, with satisfactory evidence that its use does not adversely affect the properties of concrete particularly its strength, volume changes, durability, and has no harmful effect on the reinforcement, shall be permitted. All admixtures shall be manufactured by a reputed company(ies), supported by a fully staffed technical service organization and research group.

(2) The contractor may use the following admixtures when required with the approval of the Engineer-in-charge.

a) High-range water-reducing admixtures (HRWRA)/ Super plasticizer to improve workability without reducing the strength or durability of the mix.

b) Air-entraining agent,

c) Non-shrink agent,

d) Accelerating agent in the concrete, mortar or grout to increase the rate of hydration, shorten the setting time or increase the rate of hardening or strength development

(3) Admixtures shall comply with the provisions of IS:9103 or in case of lack of corresponding IS, the ASTM specifications C494 and C260.

(4) Admixtures shall be stored and handled so as to avoid contamination or damage to their properties by temperature or moisture changes or other influences.

(5) The quantity of admixture and the method of mixing shall be strictly in accordance with the manufacturer's printed instructions or as required to produce specified results as established by mix design whichever is less, and approved by the Engineer-in-charge. No excess admixtures shall be used for getting more workability than functional requirement of structure. The contractor shall be liable for penalty for such overuse of admixture. No payments shall be made for the concrete produced in case of such overuse of admixture.

(6) The contractor shall be held liable for any damages and difficulties resulting from the selection and use of admixtures such as delay in concrete placing or damage to concrete during forms removal and shall not be entitled to any time extension or claims resulting there from.

6.5 CONCRETE MIX DESIGN

(1) Denomination of concrete classes is based on the nominal cube compressive strength in Newton per square mm and maximum aggregate size, e.g. M20A20

(2) The cube compressive strength is defined as the strength as measured at 28 days. The strength shall comply with the requirements of IS:456.

(3) The specific class of concrete to be used in each area will be shown on the Approved Construction Drawings or as designated by Engineer-in-charge.

(4) At least 4 months prior to commencement of any concreting of permanent works, the contractor shall start the testing of materials, propose the composition of concrete mixes and prepare trial mix of each of the proposed concrete class. The contractor shall prepare the trial mixes using the cement, water, aggregates and admixtures intended for the work and which conform to the requirements specified in this section.

(5) Contractor shall determine, in accordance with IS standards and/or ACI Manual of Concrete Practice, the mix proportions for the designated classes of concrete. In proportioning concrete the quantity of both cement and aggregate shall be determined by weight. Water shall be either measured in volume in calibrated tank or by weight. The proportion of ingredients shall be such that concrete has adequate workability for conditions prevailing at work in question and can be properly compacted. The contractor shall submit the test reports to the Engineer-in-charge for approval.

6.6 QUALITY CONTROL

6.6.1 General

(1) The contractor shall be completely responsible for performing detailed quality control program during the execution of the work. This quality assurance program shall be subject to inspection and checking by the Engineer-in-charge or his authorized representative.

(2) The Contractor shall keep records of test results, which shall be presented to the Engineer-in-charge upon request.

(3) Should the Contractor wish to change his approved testing program he shall notify the Engineer-in-charge of these changes 2 weeks in advance.

(4) Besides Contractor's testing program the Engineer-in-charge will make control test to the extent as he deems necessary. The Contractor shall give all required assistance in sampling

and provide for the proper storage and transport of the specimens to be tested by the Engineer-in-charge.

6.6.1.1 Site Laboratory

(1) The Contractor shall build, equip and operate the site laboratory in which the tests included in the Quality Control Programme will be carried out. In some cases where special tests are required, they will be made in other specialized laboratories after approval by the Engineer-in-charge.

(2) The laboratory shall be equipped with all the necessary equipment to carry out the tests indicated below.

a) Tests on aggregates as per IS 2386 (Parts I,II,III,IV)

- Sieve analysis
- Compressive strength
- Specific gravity
- Water absorption
- Flakiness
- Sand equivalent
- Soundness and organic matter
- Los Angeles abrasion
- Impact test

b) Tests on cement

- Equivalent alkaline content (IS 4032)
- Specific Blaine surface (IS 4031(6))
- Standard Mortar Compressive Strength (IS 4031(6))
- Shrinkage (IS 4031 (10)
- Setting time (IS 4031(5))

(c) Tests on fresh concrete

- Consistency through slump test (IS 1199)
- Workability

(d) Tests on hardened concrete

- Compressive strength on all classes of concrete (IS 516)
- Shrinkage (IS 4031(10))

6.6.2 Concrete Sampling and Testing

6.6.2.1 Aggregates

(1) Aggregate samples shall be taken from silos at the batching plant or from the conveyor belt.

(2) The sampling shall be done at the frequency of one every 1,000 m^3 of produced concrete (cumulative of all concrete classes) and once a week at minimum.

(3) The following tests will be carried out.

- Sieve analysis
- Sand equivalent
- Cleanliness of gravel
- Flakiness of gravel
- Los Angeles abrasion

6.6.2.2 Cement.

(1) Quality control of cement shall first take place at the cement factory. This will be exercised by the factory itself under the supervision and the follow-up of the owner. The quality control program at site will be established jointly with the contractor and shall be submitted for the approval of the Engineer-in-charge.

(2) The following tests will be carried out at both laboratories of the factory and the contractor and compared.

- Setting time,
- Expansion
- Specific Blaine surface
- Equivalent alkali content
- Standard mortar compressive strength

(3) Furthermore, each week, a sample of cement shall be taken at the batching plant and the following tests shall be carried out.

- Setting time,
- Specific Blaine surface,
- Standard mortar compressive strength at 3, 7 and 28 days.

6.6.2.3 Admixtures.

(1) Admixtures to be used for concrete production shall be tested for their suitability with the cement and other materials under actual working conditions. Each shipment of admixtures shall be tested for density and dry extract.

(2) Admixtures older than 12 months after their manufacturing, shall be tested for deterioration.

(3) Total lot of admixtures from which the tested sample failed the criteria, shall be rejected.

6.6.2.4 Water

A sample of water will be taken from the concrete batch plant every 3 months and submitted to chemical analysis as described in IS 3025-1964.

6.6.2.5 Fresh Concrete

(1) A random sampling shall be adopted. Sampling should cover all mixing units and spread over the entire period of concreting.

(2) Minimum frequency of sampling of concrete of each grade shall be as per IS 456-2000.

(3) Three test specimens shall be made from each sample as described in IS 456.

(4) The test strength of samples shall be average of three specimens. Individual variations shall not be more than 15 percent of the average.

6.6.2.6 Hardened Concrete

(1) Set of six samples for compressive strength tests at 7 and 28 days will be taken and tested for each part of the work, being defined as per the volume poured in one concreting operation.

(2) Compressive strength specimens shall be prepared by the Contractor and shall be performed in accordance with Indian Standards and Code of Practice.

6.6.2.7 Analysis of Results.

(1) The test results will include the different components analysis, the values obtained on fresh and hardened concrete and the characteristics of the corresponding batch given by the printer of the batching plant.

(2) The contractor shall present regularly to the Engineer-in-charge a synthesis of all the results in the form of tables, charts, statistical analysis (weekly and monthly reports).

6.6.2.8 Concrete Plant

Monthly checks, or when requested by the Engineer-in-charge of the concrete plant's weigh-batching accuracy, including the accuracy of any admixture dispenser, shall be made by the contractor in the presence of the Engineer-in-charge. When checked by standard weights and volumes, its accuracy shall be within 0.5% or as specified by the manufacturer.

6.7 ACCEPTANCE CRITERIA

(1) The acceptance criteria for hardened concrete shall be as per IS: 456. About 20% of the cubes cast for each day may have values less than the specified strength provided that the lowest value is not less than 85% of the specified strength.

(2) If analysis of test cube results indicates poorer concrete in the structure as per the acceptance criteria of IS: 456, the Engineer-in-charge will order the contractor to provide core tests. Location and number of cores will be decided by the Engineer-in-charge. The contractor shall take out the specified sizes of cores from the structure.

(3) In case the concrete cores fail to meet the specifications and the Engineer-in-charge is not satisfied with various tests results and quality, he will then instruct the Contractor for removal or subsequent suitable strengthening measures for such works at no extra cost. Wherever necessary the Engineer-in-Charge may make necessary changes in the proportion of mix and the contractor shall have to effect these changes and shall not be entitled to any compensation on account of such changes.

6.8 BATCHIING AND MIXING

6.8.1 General

(1) The contractor shall furnish the plant lay out and the method of concrete production, transportation and placing to the Engineer-in Charge. The contractor shall provide, operate, and maintain at the site automatic batching equipment to determine and control the quantity of each individual material entering the concrete. Batching equipment shall be

designed for such capacities, which will permit performance of the concrete work in accordance with Contractual Construction Program.

(2) Water, cement, admixtures, fine aggregate and coarse aggregates shall be measured separately and not cumulatively. The accuracy of the measuring devices shall be maintained so that the indicated measure does not vary by more than 1 percent from true measure throughout their range of use. The devices shall be capable of being operated to control the delivery of materials so that the combined inaccuracies in feeding and measuring do not exceed the following limits.

Material	Percent (by weight)
Cement	1
Water	1
Aggregates	3
Admixtures	1

6.8.2 Batching Equipment.

(1) At the batching plant, standard certified test weights shall be provided and such other auxiliary equipment as may be necessary to check the operating performance of each scale of other measuring devices. When required by the Engineer-in-charge, operator shall make these tests in his presence. Unless otherwise required by the Engineer-in-charge, check tests of equipment used for measuring water, cement, aggregate and admixtures shall be made at least every week. After completion of each check test, operator shall report the results to the Engineer-in-charge and make such adjustment, repairs or replacement as the Engineer-in-charge deems necessary to secure satisfactory performance before further use of the measuring devices.

(2) The batching equipment shall be so constructed and arranged that the sequence and timing of the batcher discharge gates can be controlled to produce an intermixing of the aggregate, water and cementing materials, as the materials pass through the charging hopper into the mixer. The batching controls shall be so interlocked that a new batching cycle cannot be started until all the weighing hoppers are completely empty.

(3) The operating mechanism in the water measuring device shall be such that no leakage will occur when the valves are closed and the discharge valve cannot be opened until the filling valve is closed.

(4) The dispensing device for adding admixtures shall be interlocked with the batching and discharging operation of the water so that the batching and discharging of the admixtures will be automatic. The device shall be capable of permitting the quantity of admixture being batched to be adjusted should this prove necessary, and shall be equipped with a suitable warning device to indicate when the level in the reservoir tank is low.

(5) The batching equipment shall include an accurate recorder for providing a continuous visible record of the measurement of each separate material, including all added water and admixture.

(6) The measuring and recording equipment shall be supported on foundations independent of those for the mixing plant to prevent them from being affected by vibration.

(7) Effective communication system including telephone shall be provided between the concrete plant and the point of placement at all times, and such facilities shall also be available at either location for use by the Engineer-in-charge as required.

(8) Volume batching will not be permitted.

6.8.3 Mixing

(1) Concrete shall be mixed in power driven stationary batch mixer of approved type and size. They shall be kept clean and in proper working order. The mixing blades in the drum shall be replaced when worn by 10% of their design dimensions.

(2) The batching plant shall be provided with a bypass such that the mix materials can be discharged directly into a transit mixer drum. This bypass is to be used only in emergency and with permission of the Engineer-in-charge.

(3) The mixing equipment shall be capable of combining the aggregate, cementing materials, water and other ingredients, within the time specified, into a thoroughly mixed and uniform mass, and of discharging the mixture without segregation.

(4) The mixers shall be so charged that some water will enter in advance of cement and aggregate and all materials shall continue to flow in as rapidly as possible. The construction of the mixers should prevent loss of materials during charging.

(5) The mixers shall not be charged beyond their rated capacities and the entire contents of the mixer shall be discharged before recharging.

(6) Unless otherwise authorized by the Engineer-in-charge for mixers of $1m^3$ capacity or less, the mixing of each batch shall continue for not less than 1.25 minutes as specified in IS:457 (but not more than 5 minute when mixing air-entrained concrete) after all materials, except the full amount of water, are in the mixer. For mixers of larger capacity, the minimum mixing time will be increased by 15 seconds for each additional $0.5m^3$.

(7) The mixing time shall be increased when, in the opinion of the Engineer-in-charge, the charging and mixing operations fail to result in the required uniformity of composition and consistency within the batch and from batch to batch.

(8) Each mixer shall be equipped with a mechanically or electrically operated timing and signaling device for indicating and assuring the completion of the required mixing period and for counting the batches.

(9) Should a mixer at any time prove unsatisfactory, it shall be replaced or its use discontinued until it is made satisfactory.

(10) Each mixer shall be cleaned after each period of continuous operation and shall be maintained in such a condition that the mixing action will not be impaired.

(11) On no account shall any addition be made to any component of a concrete batched, once that batch has been mixed and discharged from the mixer, whether for the purpose of retempering or for any other reason.

(12) Batching and mixing of concrete shall not commence unless due notice, at least 24 hours in advance, has been given to the Engineer-in-charge and written approval has been obtained for the placing arrangements, and for the preparation and accuracy of the part of the works in which concrete is to be placed.

6.9 HOT AND COLD WEATHER CONCRETING

(1) Hot weather and Cold weather concreting shall be done as per IS 7861 Part I and Part II. The maximum temperature developed after placement should not be higher than 40^0C and the concreting shall be temporarily suspended during excessive hot weather when the temperature inside the form work exceeds 63°C or the condition is such that the concrete can not be placed at the required temperature.

(2) Whenever required, the ingredients of concrete and the exposed surface of fresh or green concrete shall be adequately shaded from direct rays of the sun and protected against premature setting. The exposed faces may be kept under fine spray of water.

(3) Concreting shall be done at night during hot weather.

(4) For mass concrete in spillway and dam/barrage, the maximum lift height shall be 1.5m.

6.10 CONVEYING

(1) The method and facilities for concrete transport shall be selected by the contractor within the limitations of these specifications, and he shall be responsible for adequacy and suitability of the transporting system. The time elapse between mixing and the initial set of the concrete shall be taken into consideration. All methods used shall be reviewed by the Engineer-in-charge.

(2) The concrete transporting methods and facilities shall be such that will prevent segregation of coarse aggregate, excessive loss of slump and loss of ingredients. Equipment such as transit mixers, buckets, cars, conveyers and pumping equipment which may be used for conveying concrete, shall be of such size, design and condition as to ensure an even and adequate supply of concrete at the placement area. All equipment shall be kept clean and in good working condition.

(3) The use of chutes to convey concrete will not be permitted, except that chutes less than 3m in total length may be used immediately adjacent to or in the forms with acceptance of the Engineer-in-charge. Where chutes are used, they shall be so constructed and arranged as to permit continuous flow of the concrete without separation of the ingredients.

(4) There shall be no vertical drop greater than 1.5m, except where equipment, satisfactory to the Engineer-in-charge, is used to confine and control the falling concrete.

(5) Concrete may be dropped through flexible elephant-trunk chutes, provided methods are used at the lower end to retard the speed of the falling concrete and prevent it from segregation. Where it is necessary to drop concrete from more than 1.5m it shall fall into a hopper with a capacity of $1m^3$ more than the total capacity of the full trunk.

(6) All conveying plant shall be supported independently of the forms, except as specifically permitted by the Engineer-in-charge.

(7) The conveying plant shall be kept free from hardened concrete and foreign materials, and shall be cleaned at frequent intervals.

6.11 DRILLING HOLES AND GROUTING ANCHOR BARS IN ROCK.

In case of rock foundation, as shown in the approved drawings or as directed by the Engineer-in-Charge, holes shall be drilled into the rock to receive bars for anchoring concrete structures or parts thereof to the rock. The types and dispersions of the anchor bars and the locations, diameters and depths of the anchor bar holes shall be as shown on the drawings or as directed. The diameter of each hole shall not be less than 1 ½ times the largest transverse dimension of the bar specified for that hole subject to a minimum of 12mm over the bar diameter. Anchor bars shall be cleaned thoroughly before being placed. The holes shall be washed out and cleaned thoroughly and shall then be completely and compactly filled with grout of proper proportions. Each anchor bar shall be forced into place to full depth immediately after the grout has been placed and shall then be rapped or vibrated until the entire embedded surface of the bars is in intimate contact with the grout. Special care shall be taken to prevent any movement of bars after they have been placed till the grout has adequately hardened. Alternatively the insertion of the

anchor bar into the fresh grout filled hole may be carried out immediately prior to placement of concrete in the location, the hardened concrete will then prevent undesirable vibration being imparted to the anchor bar and lead to avoidance of separation.

6.11.1 PLACING ANCHORS IN CONCRETE

Anchor bolts, structural shapes, plates and bearings required in connection with the installation of gates. Gate hoists and operating machinery shall be placed in concrete as shown on the drawings or as found necessary. Wherever practicable, anchors shall be installed before the concrete is placed and except as otherwise provided drilling for the installation of anchors in the concrete will not be permitted. Where the installation of anchors prior to placing the concrete is not practicable, satisfactory formed openings shall be provided and the anchors shall be grouted in to the openings later. Anchor bolts for machine may be placed in approved pipe sleeves to facilitate installation of machinery and the sleeves shall be completely filled with grout after the locations of the holes are finally determined.

6.12 PLACING

6.12.1 General

(1) Contractor shall place concrete in a given location only after the Engineer-in-charge has agreed with the placement of such concrete. All concrete shall be placed in presence of the Engineer-in-charge. Concrete placed without prior knowledge and approval of the Engineer-in-charge may be required to be removed and replaced at contractor's cost.

(2) The contractor shall furnish, install, maintain and operate a telephone system or radio, linking the points of placing concrete with the concrete batching and mixing plant. These facilities shall also be available to the Engineer-in-charge at all times.

(3) When placing the concrete by pumping, direct communication shall be maintained between the concrete placing crew and the pump operator.

(4) In order to reduce bleeding, slump shall not be higher than necessary to achieve proper placement and consolidation. Concrete shall be placed before initial set has occurred, initial set time being determined in the laboratory.

(5) No concrete shall be placed when the atmospheric conditions are, in the opinion of the Engineer-in-charge, such that proper placing and hardening of the concrete are not guaranteed. Specifically, the contractor shall have the responsibility for meeting the hot and cold weather concreting requirements and for postponing concreting whenever such requirements cannot be met or, based on weather forecast, probably cannot be met. Even if the above requirements are fulfilled, the contractor has the responsibility of delivering concrete product that meets specified requirement.

6.12.2 Preparation for concrete placing.

(1) Concrete shall not be placed until all formwork, installation or embedded parts, reinforcing steel, and surfaces against which concrete is to be cast have been accepted by the Engineer-in-charge.

(2) All surfaces of form and embedded items that have become encrusted with dried material from concrete previously placed shall be cleaned of all such material before the surrounding adjacent concrete is placed.

(3) Concrete shall not be placed in any structure until all water entering the space to be filled with concrete has been properly cut off or diverted by pipes, or by other means, and carried

out of the forms clear of the work. Water shall not be allowed to stand on any concrete surface until it has attained its final set. Water flow over the concrete, which may injure the surface finish will not be allowed.

(4) Pipes, conduits, dowels and other items to be embedded in concrete shall be so positioned and supported prior to placement of concrete to be stable and provide sufficient clearance (50mm min.) between said items and steel reinforcement to allow proper concreting. Securing such items in position by wiring or welding to reinforcement will not be permitted.

(5) Where excavated surfaces which are to form the foundations for structural concrete, are absorptive or likely to become otherwise unsuitable, or where shown on the Construction Drawings, the contractor shall place a 'blinding course' consisting of a layer of Class M10 or M15 concrete 50 to 100 mm. Thick, as directed by Engineer-in-charge, uniformly over the foundation such that the upper surface is at grade elevation. Blinding concrete shall be placed before installing reinforcement or formwork.

(6) Immediately before concreting, the forms and all other surfaces which will be in contact with the fresh concrete shall be cleaned of all loose material and debris including shavings, wood chips, sawdust, pieces of wire, nails, fragments of hardened concrete and mortar. Clean-out holes which may be needed for this purpose shall subsequently be securely closed in order to obtain the required surface finish.

(7) The use of compressed air for cleaning will be allowed only if adequate precautions are taken to avoid the deposition of suspended oil or construction joint surfaces, reinforcement or other items which are to be bonded to concrete.

(8) The contractor shall provide such personnel and equipment so that the performance of the concrete work is in a satisfactory manner. The transporting and placing equipment shall be clean and in good condition, adequate, and properly arranged to proceed with the placing without undue delays. The number and condition of vibrators for use and standby shall be ample for the requirements during placement. The lighting system shall be sufficient to illuminate the inside of the forms when concrete is placed at night.

(9) The contractor shall have protective coverings available for fresh concrete surfaces if there is a possibility of rain or hail.

(10) Rock surfaces against which concrete is to be placed shall be clean and free from oil, standing or running water, mud, loose rock, objectionable coating, debris, and loose or unsound fragment. Faults, fissures and seams shall be cleaned to sound rock, and if directed, backfilled with dental concrete, shotcrete or dry-pack as appropriate.

(11) Immediately before concrete is placed, all surfaces shall be cleaned thoroughly by the use of high velocity air-water jets, sweeping with brooms, wet stand blasting, bush-hammering, or other satisfactory means including combinations of the above.

(12) Rock surface against which concrete is to be placed shall be kept wet for at least 12 hours during the 24 hour period prior to placing concrete and shall be in a damp condition at the time of placing, with all pools of water removed.

(13) Foundation of porous or free draining material shall be thoroughly compacted by flushing and subsequent tamping or rolling, if necessary. The finished foundation surface shall then be blanketed with a layer of tar paper or closely woven burlap carefully lapped and fastened down along the seems so as to prevent the loss of mortar from concrete.

(14) Before any concrete is cast against previously placed concrete the surface of the old concrete shall be prepared as described in sub-section "Construction Joints".

(15) If concreting is not started within 24 hours of the approval being given, it shall have to be obtained again

6.12.3 Placing and Compaction.

(1) Concrete shall be carefully placed in designated position. Where dense reinforcement or deep forms may cause segregation of concrete while placing, suitable methods shall be used to prevent segregation. The free fall of concrete shall not exceed 1.5m.

(2) Concrete shall be placed directly in its permanent position and shall not be worked along the forms to that position. Vibrations shall not be used to move concrete laterally.

(3) The addition of water into concrete after batching to compensate for stiffening of the concrete before placing shall not be permitted.

(4) All concrete, with exception of concrete tunnel lining, shall be placed in continuous approximately horizontal layers. The size of the concrete lift shall be as shown on the construction drawings. The lift height shall generally not exceed 1.5m. The thickness of the layers shall not exceed 500mm for mass concrete, and for structural and all other concrete. Each layer shall be soft when a new layer is placed upon it so that no seams or planes of weakness within the section can form, and the two layers shall be made monolithic by penetration of vibrators.

(5) The Engineer-in-charge reserves the right to order a reduced thickness of layers where the layers as stated above cannot be placed in accordance with the requirements of these specification.

(6) Time interval between successive lifts of mass concrete shall be determined by the Engineer-in-charge. Nevertheless a minimum of 72 hours shall elapse between successive lifts.

(7) No concrete shall be placed under water except where shown on the Construction Drawings or specifically so required by the Engineer-in-charge. No concrete shall be placed in running water. Water shall not be allowed to rise over freshly poured concrete until final set has been achieved.

(8) Each layer of concrete shall be consolidated to the maximum practicable density, be free from pockets of coarse aggregate, completely fill all recesses in forms and around embedded parts, and be free of all voids. The concrete shall be compacted and worked into all corners and angles of the forms, around reinforcement and embedded items without permitting the component concrete materials to segregate.

(9) No layer of concrete shall be placed until the previous layer in the same lift has been thoroughly consolidated. Each layer of concrete within a lift shall be covered with fresh concrete as soon as possible, but certainly within the period when the lower layer is still capable of being revibrated so that successive layers can be thoroughly worked together.

(10) The maximum permissible time between the placing successive layers in a pour shall not exceed initial setting time of cement or 45 minutes, whichever is less, and shall be reduced to suit the temperature, humidity and job conditions. Concrete shall not be piled up in the forms in a manner that causes movement of the unconsolidated concrete, or permits mortar to escape from the coarse aggregate.

(11) Treatment of Cold Joint

In placing the concrete, delay may occur resulting in cold joints within a lift. When placement is resumed while concrete is still green and not fully hardened (and therefore capable of ready bonding) ,all laitance shall be removed by scrubbing the wet surface with wire or bristle brushed off with a hand pick, care being taken to avoid dislodgement of any particle of coarse aggregate. The surfaces shall then be thoroughly wetted, all free water removed and then coated with neat cement grout. The first layer of the concrete to be placed on this surface shall not exceed 160mm in thickness and shall be well rammed against old work, particular attention being given to corners.

(12) Concrete shall be consolidated with the aid of approved immersion type mechanical vibrators complying with IS:2505 or electric or air driven vibrators operating at speed of at least 7,000 cycles/minute when immersed in the concrete. The vibrating equipment shall at all times be adequate in number of units and power to penetrate concrete when it is being placed, to the satisfaction of the Engineer-in-charge. Vibrators with flexible operating shafts shall be used for reinforced concrete and for concrete in restricted forms. At least one extra vibrator in working condition shall be constantly on hard at each point of placement for emergency use.

(13) Application of the vibrators shall be made systematically and at such intervals that the zones of influence overlap and the concrete is properly compacted.

(14) Every vibrator shall be operated in a near vertical position and the vibrating head shall be allowed to penetrate under the action of its own weight. In consolidating each layer of concrete, the vibrating head shall be allowed to penetrate and vibrate the concrete in the upper portion of the underlying layers. Extreme care shall be taken to ensure that the vibrators do not touch or disturb the reinforcing, embedded steel or forms.

(15) To ensure even and dense surfaces which are free from aggregate pockets, honeycombing or air holes, it may be necessary to supplement internal vibration with hand-spading along the boundaries of the concrete and around embedded part while the concrete is plastic under the vibratory action. Should slip forms be used, the equipment and methods shall be such that the finished concrete will be well consolidated and homogeneous.

(16) Form vibrators shall not be used unless the forms are designed for form vibration and unless specifically authorized by the Engineer-in-charge.

6.12.4. Pumping Concrete.

(1) Positive displacement pumping or other approved methods may be used to place concrete in locations approved by the Engineer-in-charge. The type and arrangement of equipment shall be subject to approval and the equipment shall be operated only by experienced persons. Pneumatic placing will not be allowed.

(2) The equipment and its method of operation shall allow the concrete to enter the forms at a lower velocity.

(3) Concrete pumps and auxiliary equipment shall be in good condition and shall be maintained as such throughout the duration of the work. Thorough washing down of all parts that come in contact with concrete shall be performed after each concreting operation.

(4) Pump lines shall consist of rigid steel pipe or flexible pipe made of rubber, spiral-wound flexible metal or plastic, or combination of both. Use of aluminum pipe for pump lines shall not be permitted. Couplings shall be leak proof and strong enough to withstand handling during erection and poor support along the lines. They shall provide a full internal cross section with no constrictions of the smooth flow of concrete.

(5) Immediately prior to the start of all concrete pumping, the pump and pump lines shall be primed by pumping an approved grout mixture through the equipment.

(6) Concrete pumping operations shall be planned in such a way that concrete does not set before the succeeding layer is placed thereon. An adequate supply of fresh concrete shall be provided at all times.

6.12.5 Concrete in Block outs, Second Stage in Restricted Locations, etc.

(1) All concrete required to be placed in block outs to permit the installation and adjustment of mechanical and other equipment, around formed holes and second stage concrete in other locations shall be included in respective concrete as described in these specification.

(2) The concrete surfaces of block outs and first stage concrete at other locations shall be chipped and roughened as described herein before second stage concrete is placed at such locations.

(3) Exceptional care shall be taken to place concrete in block outs in order to ensure satisfactory bond with concrete previously placed and to secure complete contact with all metal works in the block outs.

(4) The roughening of the first stage concrete surfaces shall be attained by chipping or sand blasting as approved by the Engineer-in-charge and in such a manner as not to loosen, crack or shatter any part of concrete beyond the roughened surfaces.

(5) After being roughened, the surfaces of concrete shall be cleaned thoroughly of loose fragments, dirt and the objectionable substances and shall be sound and hard to ensure good mechanical bond between the existing and new concrete.

(6) Second stage concrete shall be placed in lifts of not more than 3.0m and concrete placement rate shall not exceed 1.5m per hour except as otherwise approved by the Engineer-in-charge.

6.13 FINISHING OF CONCRETE

6.13.1 General

(1) The quality of the surface finish shall be in accordance with the requirements for the particular class of finish specified hereunder. The finished surfaces of concrete shall be free from areas of honeycombs, segregation, loss of cement or fine material, from damage due to stripping of forms, from bolt holes, abrupt irregularities caused by movement of forms or components, loose knots and similar features and bulges or depressions in the general plane of the surface.

(2) Only one type of formwork shall be used for all parts of a concrete structure which is visible from any direction.

(3) The classes of finish shall be as shown on the construction drawings or as directed by Engineer-in-charge.

6.13.2 Bush Hammer Finish

Bush hammer finish shall be applied on the surfaces when required by the Engineer-in-charge, But hammering shall not commence until at least one month after placement of concrete. The tool used for bush hammering shall be electrically driven and have a head 3 cm^2 with 16pyramid shaped teeth. The surfaces shall be finished at a rate of 250 to 400 cm2/ minute indenting the concrete surface approximately 2 mm.

6.14 CONSTRUCTION JOINTS IN CONCRETE STRUCTURES

(1) Construction joints are defined as concrete surfaces on or against which concrete is to be placed and to which new concrete is to adhere and which have become so rigid that the new concrete cannot be incorporated integrally with that previously placed.

(2) Construction joints shall be located in the position shown on the construction drawings or as required by the Engineer-in-charge and the contractor shall not be permitted to form any additional joints or deviate from the joints indicated on the Drawings, without the written authorization of the Engineer-in-charge. Necessary re-arrangement of steel reinforcement arising from such modifications shall be to the contractor's debit.

(3) Horizontal construction joints shall be arranged, wherever possible, to coincide with joints in the formwork.

(4) Joints at exposed surfaces of concrete shall be straight and continuous. Feather-edged construction joints will not be permitted.

(5) The faces of vertical joints shall be shuttered with expanded metal or other approved rough materials. The expanded metal shall be removed as far as possible before the adjacent lift is poured. If required, the surface shall be cleaned by wet sandblasting and roughened by light bush-hammering.

(6) The surface of construction joints upon or against which new concrete is to be placed and to which new concrete is to adhere shall be clean, rough and free of water when covered with fresh concrete. The laitance, loose or defective concrete and foreign material shall be removed from the surface of existing concrete. The previous concrete lift shall be saturated by water but surface dry when the successive lift is placed.

(7) The surface of the hardened concrete shall be cleaned and roughened by wet-sandblasting and washing thoroughly with air-water jet. Care shall be taken to prevent undercutting of aggregate in the concrete during sandblasting.

(8) Wet-sandblasting equipment shall be operated at an air pressure or approximately 7 bars. Sand to be used for blasting shall be dense, hard, not easily broken and sufficiently dry.

(9) In lieu of wet-sandblasting the contractor may propose high-pressure water blasting utilizing pressures not less than 400 bars, provided that such high-pressure water blasting produce equivalent results to those obtainable by wet-sandblasting.

(10) The horizontal surfaces of construction joints may be treated by cutting with an air-water jets ("green-cutting"). This shall be performed after the initial set has taken place but before the concrete has become too hard for effective cutting. This is generally done within 8 to 16 hrs of laying the concrete. The fresh concrete surface shall be cut with air-water jets to remove all laitance and to expose clean, sound aggregate. For effective green cutting, the air pressure should not be allowed to fall below 6.33 kg/cm^2. After cutting, the surface shall be washed with clean water. Care shall be taken that the treated surface does not become contaminated before new concrete is placed upon it. Should the surface become contaminated that a satisfactory joint with new concrete is not ensured the contractor shall clean it by means of wet sandblasting.

(11) Water used in cutting, washing and rinsing of concrete surfaces shall be disposed of in such a way that it does not stain, discolour or affect exposed surfaces of the structures.

(12) When necessary, as determined by the Engineer-in-charge structural concrete placement in forms shall be started with an over sanded mix with 20 mm maximum size aggregate, an

extra 50Kg of cement per cubic meter and a 100 mm slump. This mix will be referred to as a starter mix and shall be placed approximately 50mm deep.

(13) Disturbance of the surface at a joint during the early stages of hardening shall be avoided , and traffic on the concrete will not be permitted until the concrete has hardened sufficiently to withstand such treatment without injury.

(14) All construction joints shall be kept continuously moist until they are covered with concrete, provided that, if it becomes necessary to delay the placement of new concrete on or against a construction joint for an extended period, moist curing of the surface of the joint may be discontinued at the expiration of the regular prescribed curing period. If the moist curing is so discontinued, it shall be resumed not later than 24 hours prior to the placement of new concrete against the joints.

6.15 CURING AND PROTECTION OF CONCRETE.

(1) Plant for curing and protection of concrete shall be available at the location of each concrete placement before concrete placement is started. The water used for curing shall meet the requirements for water used for mixing concrete. The curing water temperature shall not exceed 25°C.

(2) Exposed surface of concrete, which has been finished as specified, shall be protected from the direct rays of the sun for at least 3 days after placing. Freshly placed concrete shall be protected from damage by rainfall.

(3) Exposed surfaces shall be kept moist or the moisture in the concrete shall be prevented from evaporating for at least 14 days after placing by means of continuous sprinkling or spraying with water, or by covering with saturated materials like burlop/hessian cloth etc or a system of perforated pipes, mechanical sprinklers or hose or by any other methods approved by the Engineer-in-charge.

(4) Care shall be taken not to disturb the steel reinforcement projecting from any placement for at least 24 hours after the completion of such placement.

(5) The contractor shall not move any load on concrete surfaces which in the opinion of the Engineer-in-charge have not attained sufficient strength. In case loads are required to be moved, the Engineer-in-charge may permit contractor to do so on condition that contractor provides the means for protecting the concrete surface subject to approval of the Engineer-in-charge.

(6) The Engineer-in-charge may permit the use of curing by means of membrane forming compounds. Sealing compounds proposed by the contractor will be subject to sampling and testing and will have to be approved of the Engineer-in-charge.

(7) Curing compounds shall be applied according to the manufacture's recommendations to provide a continuous uniform membrane over all area. Curing compounds shall be applied only after moist curing has been carried out for at least 24 hours. Curing membranes shall be protected from damage at all times.

(8) Curing compound shall not be used on any uniformed surface where, in the opinion of the Engineer-in-charge, the irregularities in that surface would prevent the membrane forming an effective seal, on any surface which has a temperature lower than manufacturer's recommended application temperature, on any surface where a bond is required for additional concrete or where a bonded surface coating is to be applied. Where a curing

compound is placed on a surface where a bond is required, it shall be removed by sand blasting or by other means satisfactory to the Engineer-in-charge.

(9) Curing compounds used for surfaces exposed to view shall degrade completely when exposed to air for more than 3 months. They are to remain at least 80% impermeable for 1 month after application.

(10) In case any curing operations are inadequate or unsatisfactory, the Engineer-in-Charge shall be entitled to take such steps as he may feel necessary to make good the deficiencies and defects, at the contractor's risk and cost.

(11) Curing and protection should confirm to latest amendment of IS 457.

6.16 REPAIR OF CONCRETE

6.16.1 General

(1) Repair of damaged or defective concrete shall be performed by skilled workmen only, and in the presence of the Engineer-in-charge. No repair work shall be carried out until the Engineer-in-charge has inspected the location of the proposed repair and accepted the method of repair proposed by the contractor.

(2) Contractor shall correct all imperfections on the concrete surface within 24 hours of removal of forms. The proven methods of repair of concrete are outlined in the USBR Concrete manual, which include Dry-pack Mortar, Replacement Concrete, Replacement Mortar, Replaced Aggregate Concrete, Epoxy Concrete etc.

(3) Where concrete is exposed to flowing water or to weather, porous and fractured concrete and surface concrete to which additions are required to bring it to prescribed lines shall be removed by chipping into the concrete a minimum of 75mm below the reinforcement or to the depth required by the Engineer-in-charge if sound concrete is not encountered at 75mm. Repair areas shall be formed and area filled with fresh concrete. If the concrete section to be repaired contains no reinforcement, concrete shall be chipped to a minimum depth of 100m.

(4) The chipped openings shall be sharp edged and keyed and shall be filled to the require lines with fresh concrete or patching mortar, as approved by the Engineer-in-charge. Where concrete is used for filling, the chipped openings shall not be less than 75 mm in depth and the fresh concrete shall be reinforced and doweled to the surface of the openings, as directed by the Engineer-in-charge.

(5) Dry pack mortar for patching shall consist of 1 part cementing material, 2 parts by volume of regular sand, and just enough water so that after thorough mixing of the ingredients the mortar will be held together when compacted by squeezing with the hand. The mortar shall be fresh when placed, and any mortar that is not used within 1 hour after preparation shall be washed. Just prior to mortar application, the surface to which the mortar is to bond shall be kept wet for at least 2 hours, then scrubbed with a small quantity of cement grout using a wire brush.

(6) When repairs are more than 25mm deep, the mortar shall be applied in layers not more than 20 mm thick to avoid sagging. After each layer, except the last is placed, it shall be thoroughly roughened by scratching with a trowel to provide an effective bond with the succeeding layers. The last or finishing layer shall be smoothened with a trowel to form a continuous surface with the surrounding concrete. All patches on exposed surface shall be

neat and smooth and as nearly as possible of the same colour as the adjoining concrete. All patches shall be thoroughly bonded to the surfaces of the chipped openings, shall be cured to the satisfaction of the Engineer-in-charge and shall be sound and free from shrinkage cracks and drummy areas.

(7) For concrete surface where high velocity flows may occur and as required by the Engineer-in-charge, repairs to surfaces having F3 and U3 finishes shall be bonded with an epoxy adhesive approved by the Engineer-in-charge and used in accordance with the manufacturer's instructions.

(8) All repairs to the surface of concrete required for flowing water shall be ground smooth to meet the tolerances specified for that surface.

6.16.2 Sealing works in Concrete Lining of Underground Structures.(Not Applicable)

(1) The contractor shall carry out sealing work to reduce water inflow and water losses through, and to guarantee the normal water tightness of the concrete lining of underground structures according to criteria stated hereafter and as directed by the Engineer-in-charge.

(2) The work shall consist of sealing the cold joints, construction joints, shrinkage cracks both vertical and horizontal, honeycombs, and poorly grouted or sealed grout holes. The work shall be performed intermittently, whenever water inflows are observed and measured wide cracks are discovered (especially after performance of tunnel pressure testing), or the future impermeability, in the judgment of the Engineer-in-charge, is doubtful.

(3) The sealing work shall be carried out when following phenomena are encountered.

a) Water inflow equals or exceed 1 liters/min measured at each single inflow source.

b) Any water inflow from grout holes and through honeycombs is unacceptable.

c)Cracks or joints, regardless whether they are dry or wet, of width greater than;

- 0.2mm in tunnels and shafts containing reinforcing steel
- 0.5mm in unreinforced stretches of tunnels or shafts

d) Areas of porous concrete (e.g. due to poor vibration) where depth of porosity is obviously deeper than superficial.

(4) The sealing work shall be executed as follows:

a) Crack or joint 0.2-0.6 mm wide shall be repaired as stipulated in the Section "Drilling and Grouting"

b) Crack or joint wider than 0.6mm shall be repaired as under (1) above, followed by cutting a groove 25x25mm along the joint or crack and subsequent filling with an epoxy mortar.

c) Wet joint may also be sealed by applying the "Oberhasli Method", which consist of cutting a groove as for the dry joint and by collecting the seepage water into one or several flexible plastic pipes. As soon as the groove is without running water shall be filled with a quick-setting mortar and, after its hardening, followed by pumping the cement bentonite-water slurry through the plastic pipe.

d) Areas of porous concrete shall be grouted under high pressure (30 bar) with cement grout mix W/C=0.7 by weight, containing suitable water-reducing air-entraining admixture. Grout holes shall be drilled at 500 mm spacing until the rock. After grouting, the area shall be repaired with epoxy mortar.

e) Grout holes filled only with water/cement mix shall be redrilled up to 2/3 of the theoretical lining thickness and filled with dry-pack mortar.

6.17 PARTICULAR REQUIREMENTS FOR INDIVIDUAL CONCRETE STRUCTURE

6.17.1 Concrete in the Spillway glacis:

(1) Where the over break in excavation below the theoretical lines and grades exceeds acceptable limits as determined by the Engineer-in-charge, the contractor shall place blinding unreinforced concrete over the rock foundation in such thickness that the upper surface is at the theoretical grade elevation. Surface shall be roughened before placing the structural spillway concrete.

(2) No construction joints shall be allowed in the spillway conveyance structure, unless otherwise approved or directed by the Engineer-in-charge. In case such joint is permitted, additional steel reinforcement shall be placed across the joint and the joint surface shall be shuttered with expanded metal.

(3) Construction joints shall be executed at the distances shown in the drawings. The surface of the joints shall be painted with bituminous coat or other approved bond breaker.

(4) All movement joints exposed to flowing water shall be chamfered 1:1 on upstream side and 1:8 on downstream side as the case may be.

(5) The top layer of the spillway glacis concrete shall be terminated approximately 300-500 mm below the final surface to provide room for placing the special concrete to increase the abrasion resistance of the structure. Similarly in the walls, which will come into contact with rapidly flowing water recesses will be blocked out to a depth of 300-500 mm and height of approximately 2m.

(6) This high performance concrete shall be obtained by adding silica fume and/or steel fibres in the concrete. Depending on the mix, design quantity of silica fume will be approximately 40 Kg. Per cubic meter and/or steel fibres of 60 kg. Per cubic meter. Mix proportions to be used will be determined by trial mix design. Test samples shall be made in accordance with IS:1199, tested as per IS:516 and analyzed as per IS;456. Source of aggregate for high performance concrete shall meet the requirement of wearing surface and shall be as identified by Engineer-in-charge.

(7) Silica fume shall comply with SABS CAN/CSA-A23.5-M86 or equivalent international standards. In addition, it shall meet the following requirements.

Particle size	Average not more than 0.2 micro, max. 0.4 micron
SiO content	Not less than 85%
Carbon content	Not greater than 5%
Total alkali content	Na_zO + 0.658 K2) not greater than 1.5% and when combined with OPC not greater than 0.6%.

In addition to the standard requirements for individual materials, the blended cement and silica fume for high strength concrete shall comply with the following requirements (IS:4031(3), (50, (6) and (10) 1988 and IS:4032-1988).

Min. compressive strength at 28 days 60Mpa

Min. initial setting time	90 minutes
Masx. Mortar shrinkage at 28 days	0.07%

Max. sulphate content (SO_4)	5%
Max autoclave expansion	0.5%
Max.CaO content	45%

The contractor shall present the results of quality control tests carried on a representative sample by the supplier. Once approved, the silica fume shall only be supplied from the same production plant. Deliveries shall in impervious sacks weighing about 40 kg. and shall be accompanied by manufacturers quality assurance certificate.

(8) Steel fibres shall be Dramix ZC 60/0.80 or equivalent, hook bends bundled fibres with normal dissolving. The fibre shall be clean and free from rust oil and deleterious materials. The method of storage shall be such as to prevent oxidation. Rusted fibres shall be refused.

(9) The concrete surface finishes in the gate structures and chute shall be F3, F3C, U3 and U3C. For surfaces in contact with high velocity water flow the permissible surface irregularities shall not exceed the following values.

Abrupt Gradual Measured along a line parallel to flow direction -- 5mm to10mm

Measured along a line traverse to flow direction -- 3mm to 6mm

(10) Abrupt irregularities are offset caused by displaced or misplaced form sheathing or lining or form sections, or by loose knots in forms or otherwise defective form lumber. They shall be tested by direct measurements.

(11) Gradual irregularities are all other irregularities and shall be tested by a2m long template. The templates will be a straight edge for plane surfaces or a "shaped" template for curved or warped surfaces.

(12) Furthermore the following shall apply if not otherwise shown on the construction drawings or directed by the Engineer-in-charge.

a) Abrupt irregularities parallel to the flow direction shall be eliminated completely by grinding to bevel of 1 to 20 ratio of height to length.

b) Abrupt irregularities traverse to the flow direction shall be eliminated completely by grinding to bevel of 1 to 50 ratio of height to length.

(1) **Concrete in the Plunge Pool**

(2) Concrete used for construction of the Plunge pool and the nallah channel at the diversion tunnel outlet shall be class M20 A40.

(3) Where the over break in excavation below the theoretical lines and grades exceeds acceptable limits, as determined by the Engineer-in-charge, the contractor shall place blinding unreinforced concrete over the rock foundation in such thickness that the upper surface is at the theoretical grade elevation. Surface shall be roughened before placing the structural concrete.

(4) Contraction joints shall be executed at the distances shown on the drawings. The surface of the joints shall be painted with bituminous coat or other approved bond breaker.

(5) The top layer of the Plunge pool concrete shall be terminated approximately 300-500 mm below the final surface to provide room for placing the special concrete to increase the abrasion resistance of the structure. Similarly, in the walls which will come into contact with rapidly flowing water, recesses will be blocked out to a depth of 300-500 mm and height of approximately 2m.

6.17.2 Concrete in Gravity Structures.

(1) Concrete used for the construction of mass concrete gravity structures shall be class M15/A80-150 unless otherwise approved or directed by the Engineer-in-charge. However concrete surface exposed to weathering and standing or flowing water shall be constructed of class M20/A80 concrete or as indicated on the construction drawings. Where higher strength concrete is used, part of each lift will therefore normally be composed of two classes of concrete. Water cement ratio shall not exceed 0.45.

(2) Reinforcement shall be provided at the surfaces in contact with standing or flowing water and at all openings in mass concrete.

(3) Mass concrete of dam, and spillway shall be water cured for at least 10days unless otherwise directed by the Engineer-in-charge. When curing compound is used as a bond breaking membrane at contraction joints, it shall be also be considered acceptable in meeting the curing requirements.

(4) Where the overbreak in excavation below the theoretical lines and grades exceeds acceptable limits, as determined by the Engineer-in-charge, the contractor shall place blinding unreinforced concrete class M15/A40 over the rock foundation in such thickness that the upper surface is at the theoretical grade elevation. Surface shall be roughened before placing the structural concrete.

6.17.3 Parts Embedded in Concrete.

(1) Anchors, anchor bolts, structural shapes, plates shapes, plates for gates, hoists, valves, machinery etc. and other miscellaneous parts shall be installed in the concrete by the contractor, as shown on the construction drawings or as required by the Engineer-in-charge. Wherever practicable, anchors shall be installed before the concrete is placed. Except as otherwise specified, drilling and installation of anchors in the concrete after concrete is placed will not be permitted. Before being placed in position, all anchors and embedded parts shall be thoroughly cleaned of rust, grease, paint, splashed concrete, or other anchors is not practicable before the concrete is placed, formed openings shall be provided, and the anchors grouted into the openings at a later time in a manner acceptable to the Engineer-in-charge.

(2) Embedded anchors shall be supported during embedding and embedded so that the tolerances specified will not be exceeded. Care shall be taken not to disturb or displace embedded items during concrete placement.

(3) Concrete may be placed to embed items erected by other agencies in the locations and to the dimensions shown on the construction drawings or as required by the Engineer-in-charge. The methods of placement and rates of placing concrete shall be subject to the approval of the Engineer-in-charge. Care shall be exercised that such parts shall not be damaged or disturbed by placing operations.

Unless otherwise specified the contractor shall provide any foundation, wall or roof openings and coverings, concrete floor filling sleeves in foundations, inclusive of metal works supplied by other contractors. All adjustments to foundation levels, embedding, bedding and grouting works on foundations, and cementing works into walls and floors, shall be done by the contractor including all leveling and adjustment of works in foundations and Grouting.

6.17.4 Concrete in Block outs for Equipment Embedding.

(1) The contractor shall form block outs, place reinforcement and concrete as shown on the construction drawings or as directed by the Engineer-in-charge, and in such manner as to ensure good bond with the existing concrete, to secure complete contact with the metalwork to be embedded in the block out concrete and to avoid displacement of the metal work.

(2) Block out concrete shall include the concrete around second stage gate parts, anchor bolts and anchor plates etc.

(3) Before placing concrete, all parts to be embedded shall be checked to ensure that they are firmly fixed in their required position. The surfaces of blockouts or holes shall be thoroughly cleaned and wetted. Oil and grease shall be removed by brushing and chipping of affected surfaces to a sufficient depth, or by application of approved chemicals and flushed with clear water.

(4) The parts to be embedded shall be cleaned of rust, mill scale paint, oil or grease before they are set into place. Where bond between metal parts and concrete or grout is not desired, approved material such as flake graphite or paraffin shall be applied to the metal parts. The metal surfaces shall be wetted before placing the concrete or grout.

(5) Concrete containing an approved non-shrink agent shall be used for concrete in blockouts for equipment embedding as shown on the construction drawing.

6.17.5 Grouting of the Equipment Bearing Plates and Anchors

(1) Limited spaces and small block outs where equipment bearing plates anchors, rails, etc. are placed shall be grouted under pressure.

(2) The grouting shall be performed using non-shink cement-based grout or non-shrink epoxy grout as proposed by the contractor and approved by the Engineer-in-charge. All mixing and grouting shall be performed in accordance with the manufacturer's recommendations and shall be tested prior to grouting. Technical service by manufacturer shall be organized by the contractor upon request by the Engineer-in-charge.

(3) Before placing grout, the surfaces of the base concrete to which the grout will be bonded shall be roughened and cleaned of all laitance, loose or defective concrete, any coatings or other foreign material, followed by thorough washing with water.

(4) Forms for grouting shall be installed where necessary and care shall be taken that the grouts fill all spaces under the plates leaving no voids. The exposed surfaces of the grout shall be cured as recommended by the manufacturer and no loads shall be applied until the grout has reached the design strength.

6.17.6 Porous Concrete

(1) Porous concrete shall be placed where free drainage is required and shall be produced by gap grading or single size aggregate grading.

(2) The strength requirements for porous concrete shall be as for class M10/A40 concrete. The porosity shall be such that water will pass through a slab 30 mm thick at a minimum rate of 500 l/mi/m^2 with a constant depth of water on the slab of 100 mm.

(3) Porous concrete shall not be vibrated but only placed and lightly rammed. Formed surfaces shall be Class F1 finish. Exposed surfaces of the porous concrete shall be sealed in an approved manner, such as the use of polyethylene or rendering with sand and cement, before structural concrete is placed against it.

6.17.7 Tests

(1) All cost associated with testing as described in this section shall be borne by the contractor. These shall include, but not be limited to the following.

a) The costs for all tests to be carried out prior to the start of concrete work, whether carried out at site or elsewhere.

b) Routine tests for quality control during the execution of the concrete work carried out by the contractor as specified herein and as directed.

c) Other tests required during execution of the work to be carried out by an approved test laboratory(ies).

d) Preparation, storage, handling, curing and delivery of samples to a laboratory designated by the Engineer-in-charge, if so required for additional independent testing.

(2) Should the contractor fail to adhere to his testing program, all test deemed necessary by the Engineer-in-charge to check concrete work will be performed by the Engineer-in-charge or a laboratory assigned by him, at Contractor's expense.

6.18 FORM WORK

6.18.1 Procedure for Form, Centering and temporary works.

6.18.2 All centering, for work and temporary works shall be constructed according to the approved drawing and specification.

As soon as practicable, after the acceptance of tender, the contractor shall submit a scheme showing the procedure and method by which he proposes to carry out the work, together with such details as are necessary to demonstrate the adequacy, stability and safety of the methods.

6.18.3 The approval to the general scheme of centering as well as design criteria and loading shall be obtained in good time to facilitate all preparatory works. Any delay on this account shall be the responsibility of the contractor.

6.18.4 After approval of the general scheme, the contractor shall prepare detailed design and drawings for execution of the form work, centering and temporary works. These shall be forwarded to the Engineer-in-Charge for approval. No work shall be carried out without prior approval of the Engineer-in-Charge.

6.18.5 Not withstanding the approval given to the design criteria and loading and the general scheme for the centering, the entire responsibility for the satisfactory execution of centering and all temporary works for withstanding concreting and removal of form work after stipulated interval, shall rest with the contractor and he shall be liable to pay all claims and compensation arising from any loss or damage to life and property due to any deficiency, failure or malfunctioning of the centering or the temporary works.

6.18.6 The contractor is responsible to set the forms to line and grade, achieve tightness of forms and braced sufficiently to stay in alignment and strong enough to hold the concrete. There should be no loss of mortar causing any honey-combing. Stability is a very important consideration in form work. Contractor shall ensure that the forms do not suffer from inadequate cross-bracing and inadequate horizontal bracing. Immediately before concrete is placed, the forms should be properly treated with suitable form of oil or other suitable coating material to prevent sticking to the concrete. Joints between the form work and existing concrete structures shall also be grout tight. Form work shall be arranged to facilitate removal of the various parts in correct sequence, without jarring or damaging the concrete. Fixing blocks, bolts or similar devices may be

embedded in the concrete, provided they do not reduce the strength or effective cover of any part of the structure below the required standard but the use of through bolts shall be avoided as far as possible. Temporary opening shall be provided at all points necessary in the forms to facilitate clearing and inspection immediately before placing of the concrete.

6.18.7 Forms shall overlap the hardened concrete in the lift previously placed by not more than 75mm and shall be tightened smoothly against the hardened concrete in the lift previously placed by not more than 75mm and shall be tightened smoothly against the hardened concrete. Particular attention shall be paid in setting and tightening the forms for construction joints so as to get a smooth joint free from sharp deviations or projection . No jute bags or other such materials be allowed to be used to make the joints of shuttering plates leak proof.

6.18.8 If a type of form does not consistently perform in an acceptable manner, as determined by the Engineer-in-charge, the type or form shall be changed and method of erection shall be modified by the contractor at his cost.

6.18.9 Re-use of Forms etc.

6.18.10 Forms required to be used more than once shall be maintained in serviceable condition and shall be thoroughly cleaned and repaired before reuse. When metal sheets are used, the sheets shall be placed and maintained in the forms without lumps or other imperfections. All forms shall be checked for shape and strength before reuse.

6.19 Cleaning of Forms.

6.19.1` All rubbish, shall be removed from the interior of the forms. The formwork in contact with the concrete shall be cleaned and thoroughly wetted or treated with an approved composition. Care shall be taken that such approved composition is kept out of contact with the reinforcement . Before concrete is placed, the surfaces of forms designed to produce F1 and F2 finish shall be oiled with commercial form of oil that will effectively prevent sticking and will not stain the concrete surface. Form timber forms, oil shall consist of pure refined, pale, paraffin mineral oil or approved form oil. For steel forms, form oil shall be mineral oil suitably compounded with one or more ingredients which are appropriate for the purpose. Care shall be taken to keep form oil out of contact with reinforcement.

6.19.2 Contractor shall give the Engineer-in-charge due notice before placing any concrete in the forms and request him to inspect and accept the form work as to their strength, alignment and general fitness, but such inspection shall not relieve the contractor of his entire responsibility of form work to withstand concreting and for safety of men, machinery and materials.

6.20 Removal of Forms.

6.20.1 The Engineer-in-charge shall be informed in advance by the contractor of his intention to strike any form. Forms shall be removed as soon as the concrete has hardened sufficiently. Thus facilitating satisfactory curing and earliest practicable repair of surface imperfections.

6.20.2 Form on sloping surfaces of concrete, such as forms on the water sides, shall be removed as soon as the concrete attains sufficient strength to prevent sagging. Any repair or treatment required on such sloping surface shall be performed at once and followed immediately by the specified curing.

6.20.3 Forms shall be removed with care so as to avoid damage to the concrete. Damaged concrete, if any, during form removal shall be repaired in accordance with the specification for repair of concrete.

6.20.4 The following minimum time intervals of form stripping as per specifications in IS-456-1978 will generally be followed while using ordinary Portland cement.

- Walls, columns and vertical faces 24 to 48 hours or as may be decided by the Engineer-in-Charge.
- Slabs (Prop left under) 3 days.
- Beam soffits (Prop left under) 7 days.
- Removal of props under slabs spanning up to 4.5m 7 days.
  slabs spanning over 4.5m 14 days
- Removal of props under beam and arches.
  spanning upto 6m 14 days
  spanning over 6 m 21 days.

Note:- For other types of cement, the stripping time recommended for Ordinary Portland cement may be suitably modified.

6.20.5 The number of propos left under their sizes and disposition shall be such as to be able to safely carry full dead load of slab, beams or arch as the case may be together with any live load likely to occur during the curing or further construction.

6.21 Finish of Formed Surface.

6.21.1 The classes of finish and requirements for finishing of concrete surface shall be as shown in the drawing or as hereinafter specified. In the event of finishing not being specified in the drawings, The finishes to be followed shall be as directed by the Engineer-in-charge. Finishing on concrete surface shall be performed only by skilled workmen.

6.21.2 Completed concrete surfaces will be tested wherever necessary to determine whether surface irregularities are within the limits herein specified.

6.21.3 Surface irregularities are classified as 'abrupt' or 'gradual'. Offsets caused by displaced form sheathing, or lining or form sections or by loose knots or otherwise defective will be considered as abrupt, other irregularities shall be considered as gradual irregularities and will be tested by use of template, consisting of a straight edge or the equivalent there of for curved surfaces. The length of the template shall be 150cm for testing of formed surfaces and 300cm for testing unformed surfaces.

SECTION-7

ROUGH STONE DRY PACKING OF APPRONS AND SIDE REVETMENT

A DESCRIPTION OF ITEMS

Rough stone dry packing in aprons and revetments with approved quality of hard granite stones of 30 cm size and above to required shape with all leads, lifts and delifts including cost, carriage, taxes, royalty etc. of stone, labour for preparation of surface for packing, dewatering if required and all other incidental charges etc. complete as per drawing, specifications and direction of the Engineer-in-charge.

B GENERAL :

1. The pitching materials shall consist of the most durable rock fragments of approved quality selected for the purpose. Stone shall be used from the surplus usable excavated rubble or

from the approved quarries, if required and shall be subjected to thorough inspection and approval by the Engineer. The quality of individual stones shall be dense, sound and resistant to abrasion and shall be free from cracks, seams, shale partings, conglomerate, bends and other defects that would tend to increase unduly their susceptibility to destruction by water and weathering action. The shape of individual stones shall be angular. Stone having thickness less than 50% of their maximum dimensions shall not be used for pitching.

2. The compacted embankment, the slope of which is to be protected with stone pitching, shall be trimmed to the lines and slopes, as prescribed on the drawings or as directed by the Engineer from time to time. The earth obtained from this trimming shall be laid on top of the embankment if required or as directed by the Engineer.
3. Pitching shall be hand placed on upstream slope of the embankment. The thickness of pitching shall be as indicated on the drawings. The thickness shall be measured normal to the slope of the embankment. Launching apron shall be hand placed in horizontal layers and upstream and downstream of the structures and its thickness shall be as indicated on the drawings.
4. Before laying the pitching/ launching apron on level ground or on sides of the banks, the receiving surface shall be trimmed to the required slopes and profiles put by means of lines and plates at regular intervals. Depressions shall be filled up and thoroughly compacted. Pitching on inverted filter, if any, shall be started from the end and built in courses upwards. Stones shall be placed by derrick or by hand and so placed that the largest dimensions are perpendicular to the face of the slope. The larger stones shall be placed in the bottom course and for use as headers for subsequent courses.
5. All interstices between adjacent stones shall be filled with spalls of proper sizes and wedged in with hammer to ensure tight packing.

C. PREPARATION OF BED AND SLOPES

a) BED:-

The surface on which the rough stone is to be laid shall be excavated to the required level and leveled and prepared for length and Width as shown on the drawings. The base shall be compacted suitably with hand rammers or other means to have an even bedding. No packing shall be on un-compacted made up soil.

b) SIDE SLOPES:-

The sides of banks to receive rough stone revetment shall be trimmed to the required slopes and profiles put up by means of line and pegs at intervals of 3 meters to ensure, regular, straight and an uniform slope throughout. Depressions shall be filled and thoroughly compacted.

D. LAYING APRON (BED PITCHING) AND REVETMENT (PITCHING TO SIDES)

i) Apron (Bed Pitching)

a) Apron shall be provided to the dimensions and levels shown or drawings.

b) To ensure regular and orderly disposition of the full intended quantity of stone in the apron, template or cross walls in dry masonry shall be built about a meter thick and to the full height of the specified thickness of apron at intervals of 10 meter or closer as directed by the Engineer, all along the length and Width of apron. In between the cross walls the stone shall be hand packed.

c)The thickness of the apron shall be made with one stone only. Total thickness shall not be made up in two or more layers.

d) The stones shall be laid closely in position of the prepared bed and firmly set with their broadest ends downwards so that they may meet all round their bases and with the top the stone level with finished surface of packing. The stones shall be laid breakings joints as far as possible in the direction of the flow of water. The stones shall be placed normal to the surface to be protected.

e) The interstices between adjacent stone shall be filled in with stones of the proper size, well driven in, with crow bars to ensure tight packing and complete filling of all interstices. Such filling shall be carried on simultaneously with the placing in position of the large stones and shall in no case be permitted to lag behind. The final wedging shall be done with the largest size chips or spalls practicable, each chip or spall being well driven home with a hammer so that no chips or spall in possible of being picked up or removed by hand to ensure tight packing. The sizes of spalls shall be minimum 25 mm and be suitable to fill the voids in the pitching.

f) On completion, the surface presented by the apron revetment shall be even throught out, free from irregularities and the required length, breadth and slopes as specified or as shown on the plans.

ii) Revetment (Pitching to sides)

a) Revetment shall be constructed to the required length, level depth and slopes shown on the drawings.

b) Profiles or strings and pegs shall be put up to ensure that pitching is done true, straight and to the proper slopes throughout.

c) Revetment shall in all cases be built up from the foot of the bound to rivet and built up in course upwards. Care is necessary that a strong toe wall or other protection is always given to the revetment. Which protective measure shall be shown on the plans.

d) Stones shall be placed to the required length by derrick or by hand. Stones shall be set normal to the slope and placed so that the largest dimension is perpendicular to the face of the slope unless such dimension is greater than the specified thickness or pitching. The largest stone shall be placed in the bottom courses and for use as headers for subsequent courses.

E. MEASUREMENT AND PAYMENT.

Measurement and payment for rough stone dry packing for apron and revetment will be in the units of cubic meters. The payment will be made on the relevant unit price bid in bill of quantities and the unit price shall include cost of furnishing, hauling of all materials and labour involved in all the operations specified for rough stone dry packing.

SECTION-8

DETAIL SPECIFICATION OF EXPANSION JOINTS/ CONSTRUCTION JOINTER (EJ/CJ)

Description of Items

The joint should be left in concrete in required places as per drawing and design. Embedded parts if any will have to be provided prior to casting of concrete. Old surface of the concrete joints should be

made clean free of dirt, grease, protrusions or any objectionable materials as per the direction of the Engineer-in-charge. The face of the joints should be made straight. The surface of joints should be painted with bitumen/ coal tar and fitted with the approved sealing materials like bituminous filler boards, etc. The adjacent concreting masonry then only can be constructed.

In the case of P.V.C. water stop, the pieces should be jointed together at the site by vulcanising thoroughly to make it water tight having sufficient strength to withstand the designed water pressure exerted on it.

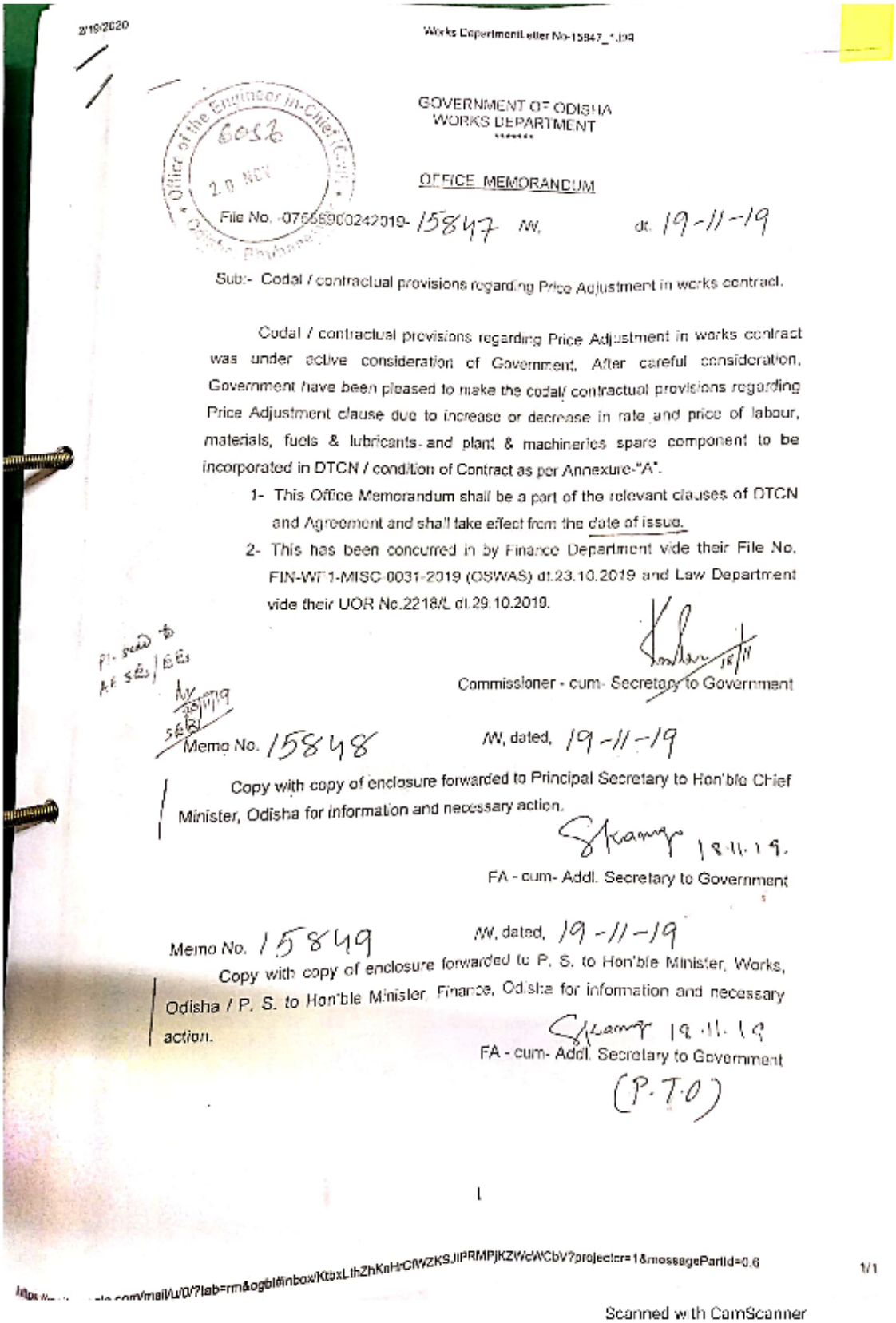
In case of copper seal, the thickness of the copper sheet should be of 16 gauge (1.63 mm) and minimum of 0.6m wide with 'V', 'U' or 'Z' groove of size 2.5 cm. at its longitudinal axis. The groove should be perfectly straight and uniform. Adjacent copper sheet should be perfectly braced together on both sides for the whole width by butting the two sheets against each other. If lapping between adjacent sheet are given, the maximum lapping should be 5 cm. and should be held together tight. Brazing should be done on both sides for the whole width. The joints should be braced, watertight and should be capable of withstanding the hydraulic pressure exerted on it. M.S. anchor rods of 6 mm to 8mm dia and 30cm long with hook on outer side and should be braced with the copper sheet @ 50 cm centre to centre approximately on both sides of copper sheet preferably staggered. The minimum length of the rod to be brazed is minimum 5 cm. and brazing should be done on both side of the rod.

The edges of the copper sheet should also be given a link at about 0.5 M. interval to have a better grip with concrete. The brazing should be done as per relevant IS specification. The P.V.C water stop shall be dense, homogeneous and free from holes and other imperfections. The cross section of the water stop shall be uniform along its lengths and thickness shall be symmetrical.
Location and embedment of the P.V.C./Copper water stops shall be as shown on the drawings, with approximately one-half of the width. Water stops shall be embedded in the concrete on each side of the joints. In order to eliminate faulty installation that may result leakage, care shall be taken that the water stops shall be installed to form continuous watertight diaphragm in the joints. Unless otherwise shown, adequate provision shall be made to protect the water stops during the progress of the work.

Additional vibrations over and above that used for adjacent concrete placement shall be carried out to assure complete embedment of the water stops in the concrete. Larger pieces of aggregate near the water stops shall be removed by hand during embedment to assure complete contact between the water stop and surrounding concrete.

SECTION-VI

PRICE ESCALATION/VARIATION



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Office of the Engineer-in-Chief (Civil) 6056 20 NOV Odisha, Bhubaneswar

GOVERNMENT OF ODISHA
WORKS DEPARTMENT
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OFFICE MEMORANDUM

File No. 07566900242019- 15847 /W, dt. 19-11-19

Sub:- Codal / contractual provisions regarding Price Adjustment in works contract.

Codal / contractual provisions regarding Price Adjustment in works contract was under active consideration of Government. After careful consideration, Government have been pleased to make the codal/ contractual provisions regarding Price Adjustment clause due to increase or decrease in rate and price of labour, materials, fuels & lubricants and plant & machineries spare component to be incorporated in DTCN / condition of Contract as per Annexure-"A".

1- This Office Memorandum shall be a part of the relevant clauses of DTCN and Agreement and shall take effect from the date of issue.

2- This has been concurred in by Finance Department vide their File No. FIN-WT1-MISC-0031-2019 (OSWAS) dt.23.10.2019 and Law Department vide their UOR No.2218/L dt.29.10.2019.

Commissioner - cum- Secretary to Government

Pl. send to AE SEs/ EEs

Memo No. 15848 /W, dated, 19-11-19

Copy with copy of enclosure forwarded to Principal Secretary to Hon'ble Chief Minister, Odisha for information and necessary action.

18.11.19.

FA - cum- Addl. Secretary to Government

Memo No. 15849 /W, dated, 19-11-19

Copy with copy of enclosure forwarded to P. S. to Hon'ble Minister, Works, Odisha / P. S. to Hon'ble Minister, Finance, Odisha for information and necessary action.

18.11.19

FA - cum- Addl. Secretary to Government

(P.T.O)

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CONTRACTOR SENIOR MANAGER (CIVIL)

Works DepartmentLetter No-15847_2.jpg

Memo No. 15850 /W dated. 19-11-19

Copy with copy of enclosure forwarded to OSD to Chief Secretary, Odisha / Sr. P.S to Development Commissioner-cum-Additional Chief Secretary, Odisha / Sr P.S. to Principal Secretary, Finance Department for information and necessary action.

18.11.19
FA - cum- Addl. Secretary to Government

Memo No. 15851 /W. dated. 19-11-19

Copy with copy of enclosure forwarded to the Principal Accountant General (A&E), Odisha, Bhubaneswar / Principal Accountant General (E & S R Audit), Odisha, Puri Branch, Puri for information and necessary action.

18.11.19.
FA - cum- Addl. Secretary to Government

Memo No. 15852 /W. dated. 19-11-19

Copy with copy of enclosure forwarded to All Departments / Managing Director, OB & CC Ltd., Bhubaneswar / Managing Director, OCC Ltd., Bhubaneswar / Chief Architect, Odisha, Bhubaneswar for information and necessary action.

18.11.19
FA - cum- Addl. Secretary to Government

Memo No. 15853 /W. dated. 19-11-19

Copy with copy of enclosure forwarded to EIC (Civil), Odisha / All Chief Engineers, Odisha / All Superintending Engineers / All Executive Engineers (under Works Department) for information and wide circulation among subordinate offices.

18.11.19.
FA - cum- Addl. Secretary to Government

Memo No. 15854 /W. dated. 19-11-19

Copy with copy of enclosure forwarded to OSWAS Control Room with a request to upload it in the web-site of Works Department.

18.11.19.
FA - cum- Addl. Secretary to Government

Memo No. 15855 /W. dated. 19-11-19

Copy with copy of enclosure forwarded to the Director, Printing, Stationary & Publication, Odisha, Cuttack by e-mail (deputydirectorpp@rediffmail.com) for publication of this Office Memorandum in the next issue of Odisha Gazette and supply 20 (Twenty) copies to this Department for official use.

18.11.19
FA - cum- Addl. Secretary to Government

Memo No. 15856 /W. dated. 19-11-19

Copy with copy of enclosure forwarded to A/C-I Section / A/C-II Section / Road Section / Plan Section / Building Section / Budget Section / N.Hs. Section / FC & AA Section / EAP Cell / Legal Cell, Works Department for information and necessary action.

18.11.19
FA - cum- Addl. Secretary to Government

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Works DepartmentLetter No-15847_3.jpg

ANNEXURE-A

Clause 31 :- Price Adjustment

31.1 : 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 following Paras.

(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 following Paras

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

R= 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 for extra items under variations.

31.2 : 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 clauses in the contract, the unit rates and prices included in the contract shall be deemed to include amounts to cover the contingency of such other rise or fall in costs

The formula (e) for adjustment of prices are:

31(a) (i): Adjustment of Other Materials Component

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

$V_M = 0.85 \times P_m/100 \times R \times (M_1 - M_0)/M_0$

V_M = Increase or decrease in the cost of work during the month under consideration due to changes 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 date of opening of Bids, as published by the Ministry of Commerce and Industry ,Government of India, New Delhi.

M_1 = The all India wholesale price index (all commodities) for the month under consideration as published by the Ministry of Commerce and Industry , Government of India, New Delhi.

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

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31(a)(ii): Adjustment for Cement Component

Price adjustment for increase or decrease in the cost of cement procured by the contractor shall be paid in accordance with the following formula:

$V_c = 0.85 \times P_c/100 \times R \times (C_1 - C_0)/C_0$

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

C_0 = The all India wholesale price index for Ordinary Portland Cement (OPC) on 28 days preceding the date of opening of Bids as published by the Ministry of Commerce and Industry , Government of India, New Delhi.

C_1 = The all India wholesale price index for Ordinary Portland Cement (OPC) for the month under consideration as published by the Ministry of Commerce and Industry, Government of India, New Delhi.

P_c = Percentage of Cement Component of the work

31(a)(iii): 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:

$V_s = 0.85 \times P_s/100 \times R \times (S_1 - S_0)/S_0$

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

S_0 = The all India wholesale price index for steel (Mild Steel long products) on 28 days preceding the date of opening of Bids as published by the Ministry of Commerce and Industry , Government of India, New Delhi.

S_1 = The all India wholesale price index for steel (Mild Steel long products) for the month under consideration as published by the Ministry of Commerce and Industry, Government of India, New Delhi.

P_s = Percentage of steel component of the work

Note: For the application of this clause, index of (Mile Steel long products) has been chosen to represent steel group.

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Works DepartmentLetter No-15847_5.jpg

31(a)(iv): Adjustment of Bitumen Component

Price adjustment for increase or decrease in the cost of bitumen shall be paid in accordance with the following formula:

$V_b = 0.85 \times P_b/100 \times R \times (B_1 - B_0)/B_0$

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

B_0 = The official retail price of bulk bitumen at the IOC / BPCL depot at nearest center on the day 28 days prior to date of opening of Bids.

B_1 = The official retail price of bulk bitumen at IOC / BPCL depot at nearest center for the 15th day of the month under consideration.

P_b = Percentage of bitumen component of the work

31(a)(v): Adjustment towards differential cost of Pipes.

Price adjustment for increase or decrease in the cost of pipe shall be paid in accordance with the following formula:

$V_{pi} = 0.85 \times P_{pi}/100 \times R \times (P_{i1} - P_{i0})/P_{i0}$

V_{pi} = Differential cost of pipe i.e. amount of increase or decrease in rupees to be paid or recovered during the month under consideration.

P_{pi} = Percentage of pipe component of the work

P_{i1} = All India Whole sale price index of pipe for the period under consideration as published by the Ministry of Commerce and Industry , Government of India, New Delhi.

P_{i0} = All India Whole sale price index of pipe on 28 days preceding the date of opening of Bids as published by the Ministry of Commerce and Industry , Government of India, New Delhi.

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31(b): Adjustment of Labour Component

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

$V_L = 0.85 \times P_l/100 \times R \times (L_1 - L_0)/L_0$

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 minimum wages for unskilled labour as Notified by Government of Odisha as prevailed on the last stipulated date of receipt of tender including extension, if any.

L_1 = The minimum wages for unskilled labour as Notified by Government of Odisha as prevailed on the last date of the Month previous to the one under consideration.

P_l = Percentage of labour component of the work.

31(c): Adjustment of POL(fuel and lubricant) Component

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

$V_f = 0.85 \times P_f/100 \times R \times (F_1 - F_0)/F_0$

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

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

F_1 = The official retail price of HSD at the existing consumer pumps of IOC / BPCL/ HPCL at nearest center for the 15th day of the month 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 fuel and lubricants group.*

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31(d): Adjustment for Plant and Machinery Spares Component

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

V_p- $0.85 \times P_p/100 \times R \times (P_1 - P_0)/P_0$

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

P_0- The all India wholesale price index for manufacture of machinery for mining, quarrying and construction on 28 days preceding the date of opening of Bids as published by the Ministry of Commerce and Industry , Government of India, New Delhi.

P_1 - The all India wholesale price index for manufacture of machinery for mining, quarrying and construction for the month under consideration as published by the Ministry of Commerce and Industry , Government of India, New Delhi.

P_p- Percentage of plant and machinery spares component of the work

Note : For the application of this clause, index of manufacturing of machinery for mining, quarrying and construction *has been chosen to represent the Plant and machinery Spares group.*

Regarding wholesale price Index (WPI) for appropriate commodity for payment of price adjustment, due to change of base year of WPI from 1993-94 to 2004-05 & 2011-12, it is observed that, the commodity 'Bars and Rod', 'Cement', 'Heavy machinery and parts' included in the list of WPI 1993-94 series are not mentioned as such in the WPI 2004-05 & 2011-12 series. Therefore, the following items in the WPI 2004-05 & 2011-12 series shall be considered corresponding to items in WPI 1993-94 series:

Sl. No.	Item in WPI 1993-94 series	Item in WPI 2004-05 series	Item in WPI 2011-12 series
1.	Cement	Grey Cement	Ordinary Port land cement
2.	Bars & rods	Rebars	Mild steel long products
3.	Heavy Machinery & parts	Construction Machinery	Manufacture of machinery for mining, quarrying & construction.

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31(e): APPLICATION OF ESCALATION CLAUSE:

The contractor shall for the purpose of availing reimbursement/refund of differential cost of steel, bitumen, cement, pipe, POL and wages, keep such books of account and other documents as are necessary to show that the amount of increase claimed or reduction available and shall allow inspection of the same by a duly authorized representative of Government and further, shall at the request of the Engineer-in-Charge, furnish documents to be verified in such a manner as the Engineer-in-Charge may require any document and information kept. The contractor shall within a reasonable time of 15 days of his becoming aware of any alteration in the price of such material, wages of labour and /or price of P.O.L. give notice thereof to the Engineer-in-Charge stating that the same is given pursuant to this condition along with information relating to there to which he may be in a position to supply.

Percentage Table

Sl No.	Category of works		% Component (cost wise)		
			Labour (P_l)	POL (P_f)	Steel (P_s)+ Cement (P_c)+ Bitumen (P_b) +Pipes (P_{pi}) + Plant & Machinery Spare &Component(P_p) + Other Materials*
1	R&B works (% of compone nt)	Road Works	5	5	90
		Bridge works	5	5	90
		Building works	5	5	90
2	Irrigation works (% of componen t)	Structural work	5	5	90
		Earth, Canal & Embankment work	5	5	90
3	P.H. Work	Structural work	5	5	90
		Pipeline Work	5	5	Pipe- 70% *Machinery + Other material -20%
		Sewer Line	5	5	Pipe- 70% *Machinery + Other material -20%

*Note:- Further break up may be worked out considering the consumption of Cement, Steel, Bitumen, pipe and Plant & Machinery Spare Component in the concerned works and shall be provided in the bid document in shape of "Schedule of Adjustment Data" as an "Appendix to Bid". (enclosed herewith).

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Works DepartmentLetter No-15847_9.jpg

Appendix to Bid
Schedule of Adjustment Data

[For all works, adjustment factor for Labour and POL shall be considered @ 5% each. Steel, Cement, Pipes, other Materials and Machinery shall contribute to 90% of Price Adjustment and shall be calculated for each work separately during preparation of estimate, shall be approved by the authority during technical sanction as a "Schedule of Adjustment Data" and shall form part of the Bid Document]

Cl. No-31 of F2/ P1 Contracts Sl. No	Index description	Source of Index	Base value*	Base Date*	Weightage of Item**
31 (a)(i)	Other Materials	All India Whole sale price index (all commodities) as published by the Economic Advisor to the Govt. of India, Ministry of Commerce and Industry.			
31 (a)(ii)	Cement	Whole sale price index for Cement (Ordinary Portland Cement) as published by the office the Economic Advisor to the Govt. of India, Ministry of Commerce and Industry.			
31 (a)(iii)	Steel	Whole sale price index for Steel (Mild Steel-Long Products) as published by the office of the Economic Advisor to the Govt. of India, Ministry of Commerce and Industry.			
31 (a)(iv)	Bitumen (VG-30)	Official retail price of bulk bitumen at the nearest IOC/ HPCL depot			
31 (a)(v)	Pipes	Whole sale price index for the type of Pipe under consideration, as published by the office the Economic Advisor to the Govt. of India, Ministry of Commerce and Industry.			
31 (b)	Labour	Minimum Wage notified by the Labour and Employee's State Insurance Department of Government of Odisha, India			5%
31 (c)	POL	Official retail price of HSD at nearest IOCL/ HPCL/ BPCL Consumer pump depot.			5%
31 (d)	Plant and Machinery	Whole sale price index for Manufacture of Machinery for Mining, Quarrying and Construction as published by the office the Economic Advisor to the Govt. of India, Ministry of Commerce and Industry.			
			Total		100%

* Values to be filled up at the time of drawl of contract
**Values to be filled up in the bid document.

18/11/19

CONTRACTOR

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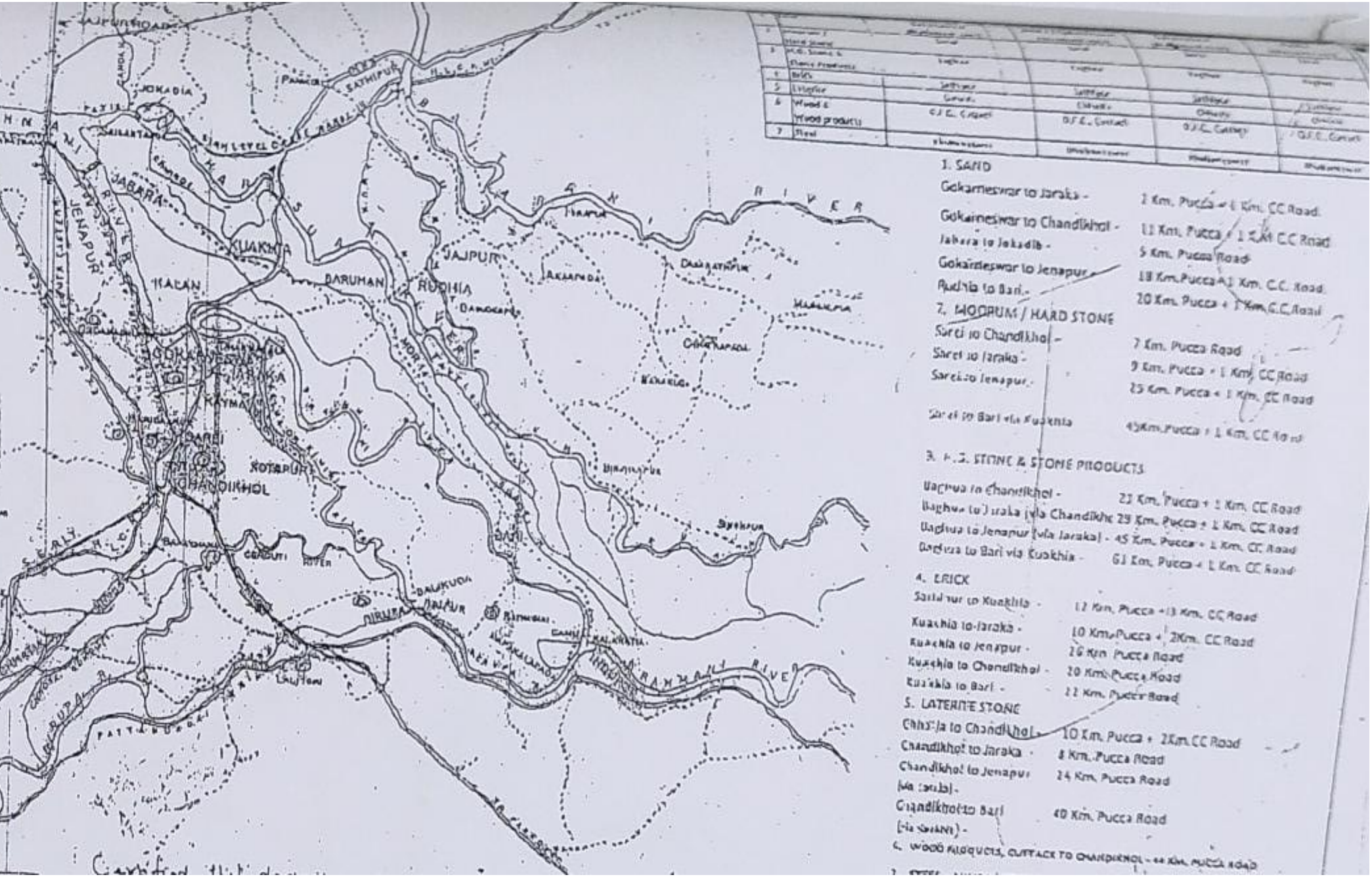
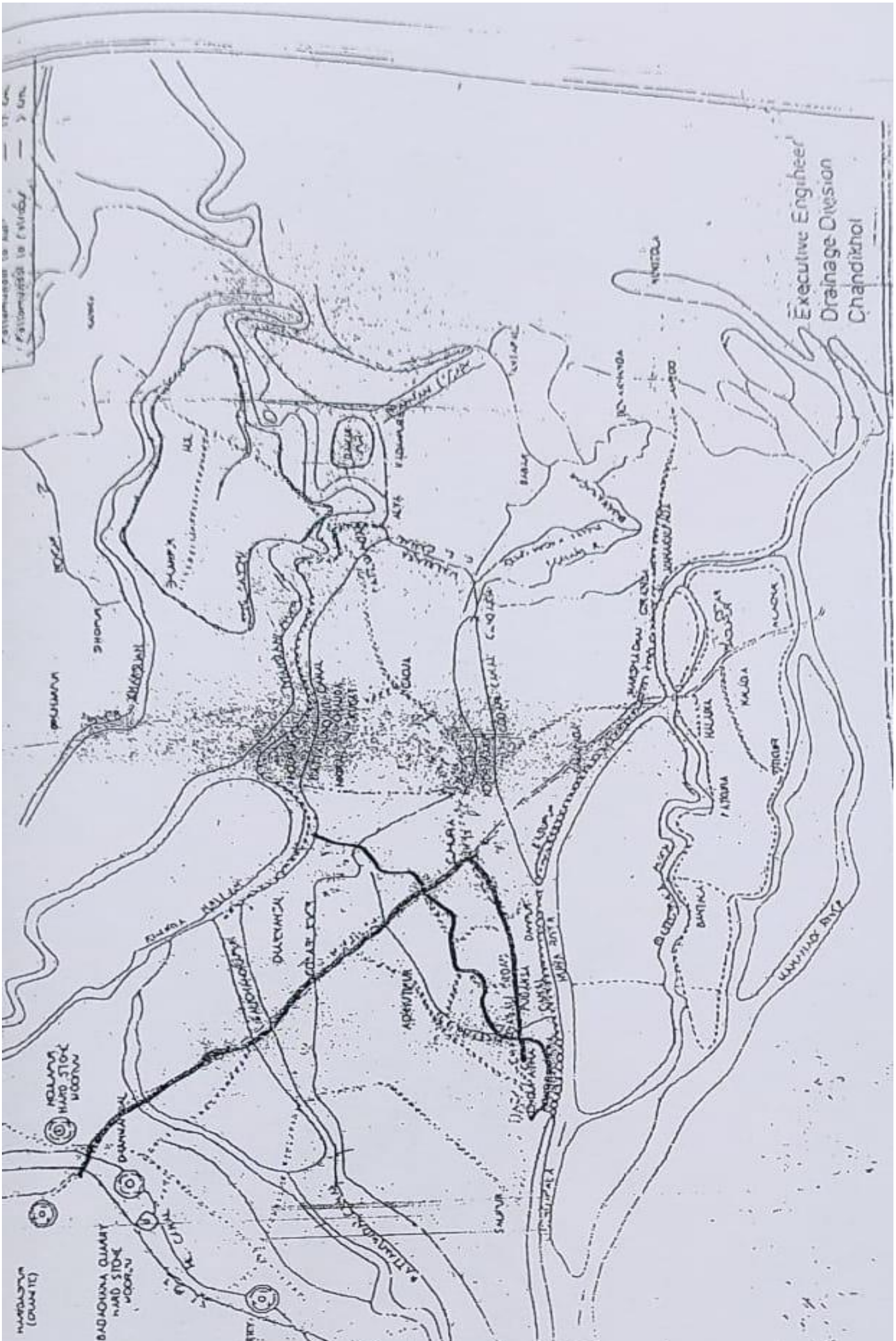
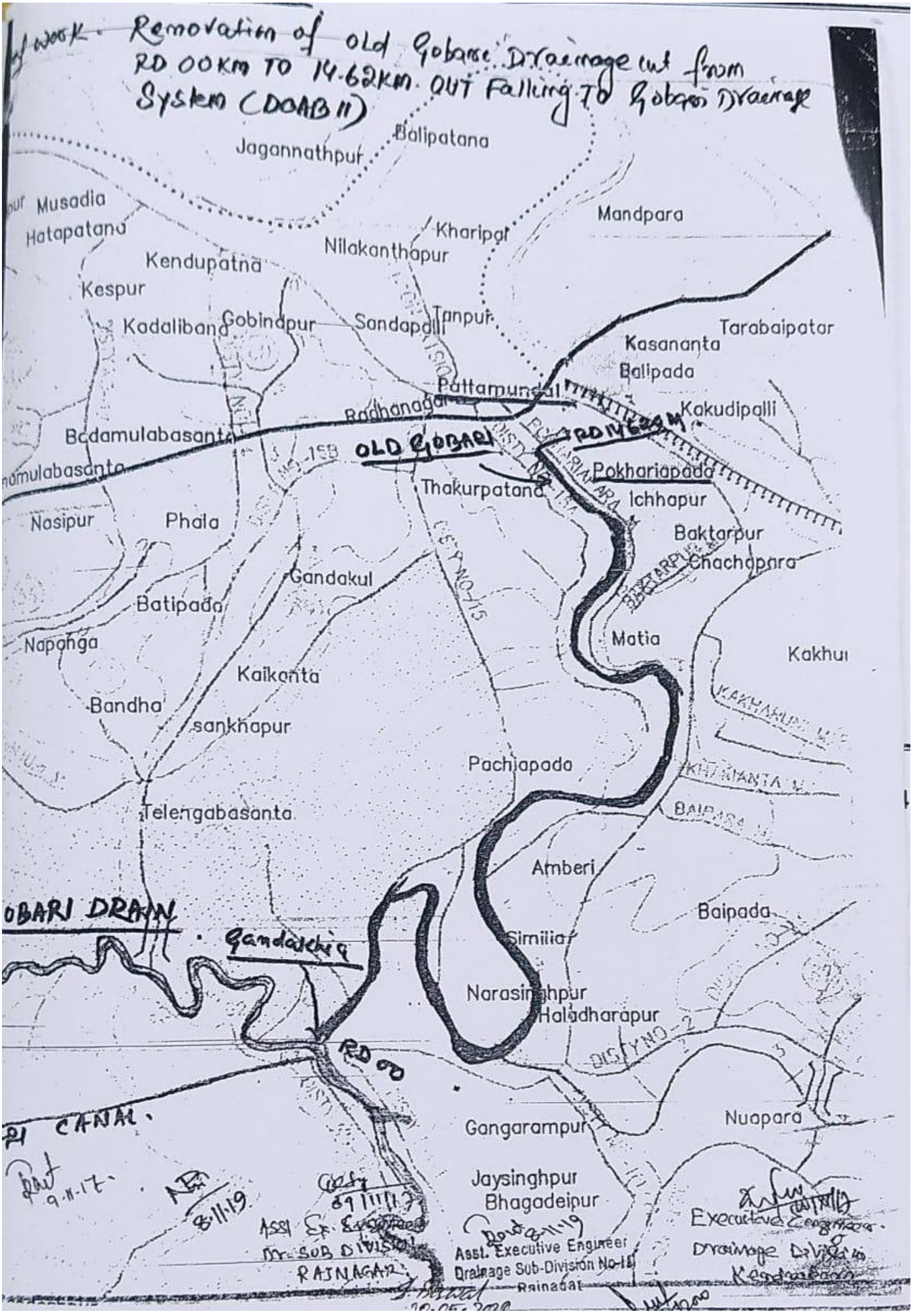
SECTION-VII

DRAWINGS


JOKADIA
SATHIPUR
JABARA
JENAPUR
KUAKHIA
KALAN
BARUMAN
RUDHIA
JAJPUR
GOKARNESWAR
JARAKA
KAYMA
BARI
CHANDIKHOL
KOTAPUR
BIRUPA
BALIKUDA
BALIPUR
RAMMANI RIVER
RIVER
1. SAND
Gokarneswar to Jaraka - 2 Km. Pucca + 1 Km. CC Road.
Gokarneswar to Chandikhol - 11 Km. Pucca + 1 Km. C.C Road
Jabara to Jokadia - 5 Km. Pucca Road
Gokarneswar to Jenapur - 18 Km. Pucca + 1 Km. C.C. Road
Rudhia to Bari - 20 Km. Pucca + 1 Km. C.C. Road
2. MOORUM / HARD STONE
Sarei to Chandikhol - 7 Km. Pucca Road
Sarei to Jaraka - 9 Km. Pucca + 1 Km. CC Road
Sarei to Jenapur - 25 Km. Pucca + 1 Km. CC Road
Sarei to Bari via Kuakhia 45 Km. Pucca + 1 Km. CC Road
3. H.S. STONE & STONE PRODUCTS
Baghua to Chandikhol - 21 Km. Pucca + 1 Km. CC Road
Baghua to Jaraka (via Chandikhol) 29 Km. Pucca + 1 Km. CC Road
Baghua to Jenapur (via Jaraka) - 45 Km. Pucca + 1 Km. CC Road
Baghua to Bari via Kuakhia - 61 Km. Pucca + 1 Km. CC Road
4. BRICK
Sathipur to Kuakhia - 12 Km. Pucca + 13 Km. CC Road
Kuakhia to Jaraka - 10 Km. Pucca + 2 Km. CC Road
Kuakhia to Jenapur - 26 Km. Pucca Road
Kuakhia to Chandikhol - 20 Km. Pucca Road
Kuakhia to Bari - 22 Km. Pucca Road
5. LATERITE STONE
Chhatia to Chandikhol - 10 Km. Pucca + 2 Km. CC Road
Chandikhol to Jaraka - 8 Km. Pucca Road
Chandikhol to Jenapur (via Jaraka) - 24 Km. Pucca Road
Chandikhol to Bari (via Kuakhia) - 40 Km. Pucca Road
6. WOOD PRODUCTS, CUTTACK TO CHANDIKHOL - 44 Km. PUCCA ROAD


Executive Engineer
Drainage Division
Chandikhol



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