



GOVERNMENT OF ODISHA

DEPARTMENT OF WATER RESOURCES

UPPER INDRAVATI PROJECT

DETAILED TENDER CALL NOTICE

For Tender Call Notice No. - SE, U.I. LCD No. - I-04 (01))/ 2026-27
Bid Identification No. - SE, U.I. LCD No. - I-04 (01))/ 2026-27

Name of Work - “Construction of Toilet Room at Division Office Building under UI Left canal Division No I , Kusumkhunti.”

SUPERINTENDING ENGINEER
LEFT CANAL DIVISION NO. - I
KUSUMKHUNT

CONTRACTOR

SUPERINTENDING ENGINEER

CONTENTS

Sl No.	Description	Page No.
1.	CHECK LIST FOR TENDER SUBMISSION	5
i	SPECIAL CONDITION CONSEQUENT UPON AMENDMENT OF CODAL/ CONTRACTUAL PROVISION	6
ii.	ADDITIONAL CONDITIONS AFTER OPWD CODE AMENDMENTS AND INTRODUCTION OF GST.	7
PART-I		
2.	TENDER CALL NOTICE	
i.	Invitation For Bids	08-11
ii.	Particulars Of Tender	12
3.	INFORMATION AND INSTRUCTION TO BIDDERS	13-22
i.	General	
ii.	Codal Provision regarding e-procurement	
4.	BID INFORMATION	23-26
i.	Letter Of Transmittal	
ii	No Relationship Certificate –Annexure – ‘C 2’	
iii.	Affidavit For Authenticity of Tender - Annexure – E (1)	
iv.	Annexure – E (2)	
v.	Annexure – F	
PART-II		
1.	CHAPTER – I	27-55
5.	ITEM RATE TENDER, BILL OF QUANTITY AND CONDITION OF CONTRACT FOR WORKS (FORM F-2)	
1.	General rules and directions for the guidance of contractor	
2.	Memorandum for Tender for work	
3.	Condition of Contract Clauses with supplementary and modifications there to with fair wage Clause	
4.	Addendum to condition of contract	
	CHAPTER – II	56-69
6.	SPECIAL CONDITION OF CONTRACT	
1.	Definition	
2.	Earnest Money Deposit	
3.	Tax Certificate	
4.	Time of Completion	
5.	Pre bid Inspection by Contractor	
6.	Validity of tender	
7.	Award of contract	
8.	Observation of law & local regulations	
9.	Accidents and safety measures	

10.	Change of address of contractor	
11.	Archaeological findings	
12.	Contemporary contractors	
13.	Taxes & Interest	
14.	Plans & drawings	
15.	Construction programme	
16.	Availability of labour	
17.	Suspension of work	
18.	Items not covered in the schedule	
19.	Force Majeure	
20.	Tools & Plants	
21.	Haul roads	
22.	Departmental Stock	
23.	Construction Shed	
24.	Site clearance	
25.	Other contractors	
26.	Order Book	
27.	Claim Book	
28.	Rule to Verbal Order	
29.	Statutory obligation of contractor	
30.	Departmental right for deviation in quantities	
31.	Emergency measure	
32.	Safety of machineries	
33.	Contractor dying, becoming insolvent, insane or imprisoned	
34.	Measurement of Works	
35.	Removal of contractor's man	
36.	Detail Call Notice being part of contract	
37.	Fair wage Clause	
38.	Labor license and registration	
39.	Price preference	
40.	Quality control and Testing of the structure	
41.	Defects Liability	
42.	Engineer-in-Charge's Decision	
43.	Payment of Price Escalation	
44.	Settlement of Dispute	
45.	Resolution of disputes & Jurisdiction of Court	
46.	Additional Clause for performance security	
47.	Cement, Steel & Bitumen	
	CHAPTER – III	70-113
7.	TECHNICAL SPECIFICATION FOR CONSTRUCTION OF CANAL & CANAL STRUCTURES	
1.	General Specification	

2.	Site of Work	
3.	Concrete works	
4.	P.H. WORK	
5.	SANITARY & PLUMBING WORKS	
6.	INTERNAL ELECTRIFICATION WORKS	
8.	CHAPTER – IV	114-121
1.	QUALITY CONTROL	
9.	CHAPTER – V	122-126
1.	Bill of Quantities	

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Check List For Submission Of Particulars

ALL DOCUMENTS AND FORMS AS SHOWN BELOW ARE MANDATORY.

Scanned Copy in .pdf format

1. Documents
 - (i) Tender fee
 - (ii) Bid Security
 - (iii) License
 - (iv) PAN
 - (v) GSTIN

2. Forms in
 - (i) Annexure 'C (2)'
No Relationship Certificate (Format given)

 - (ii) Annexure ' E (1)'
Affidavit (Format given)

 - (iii) Annexure ' E (2)' (For Out Side State Bidders)
Affidavit (Format given)

**THE BID MUST BE ACCOMPANIED WITH THE MANDATORY DOCUMENTS
AS MENTIONED IN THE CHECK LIST FAILING WHICH THE TENDER WILL
BE REJECTED.**

**SPECIAL CONDITION CONSEQUENT UPON AMENDMENT OF CODAL/
CONTRACTUAL PROVISION AS PER OFFICE MEMORANDUM NO. 12366 DT.
08.11.2013 OF WORKS DEPARTMENT, GOVT. OF ODISHA**

1. Amendment to Para-3.5.14 Note-I of OPWD Code, Vol-I by inclusion

Note-I:- if L1 bidder does not turn up for agreement after finalization of the tender, then he shall be debarred from participating in bidding for three years and action will be taken to blacklist the contractor. In that case, the L2 bidder, if fulfills, 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 blacklisted, it will be widely publicized and intimated to all department of Government and also to Govt. of India agencies working in the state.

2. Amendment to Appendix-IX, Clause- 36 of OPWD Code, Vol-II by inclusion

Clause No.-36:- If more than one bid is quoted (decimal up to two numbers will be taken for all practical purposes), either at the estimated cost put to tender or less than the estimated cost put to tender, the tender accepting Authority will finalize the tender through a transparent lottery system, where all the concerned bidders/their authorized representatives, the concerned SE/EE of the concerned Division and Divisional Accounts Officer (DAO) will remain present.

(Reference: Works Department O.M. No. 173/W dated 03.01.2026 r/w O.M. No. 632/W dated 09.01.2026)

3. Amendment to Para-3.5.18 Note-VIII of OPWD Code, Vol-I

Note VIII:- 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 of the part of the agency to achieve the milestone liquidated damaged will be imposed.

Amendment of codal/contractual provisions

Ref: Works Department office memorandum Letter No.5288 Dated. 04.05.2016.

Annexure – I

Amendment to Para-3.5.5 (V) Note-III of OPWD Code, Vol-I by modification

Note-III. For availing incentive clause in any project which is completed before the stipulated date of completion, subject to other stipulations it is mandatory on the part of the concerned Executive Engineer to report the actual date of completion, of the project as soon as possible through fax or e-mail so that the report is received within 7 (Seven) days of such completion by the concern Executive Engineer, Chief Engineer & the Administrative Department.

The incentive for timely completion should be on a graduated scale of 1 (One) percent to 5 (Five) percent of the contract value. Assessment of incentives may be worked out for earlier completion of work in all respect in the following scale.

Before 30% of contract period = 5% of Contract Value

Before 20% to 30% of contract period = 4% of Contract Value

Before 10% to 20% of contract period = 3% of Contract Value

Before 5% to 10% of contract period = 2% of Contract Value

Before 5% of contract period = 1% of Contract Value

ADDITIONAL CONDITIONS

- 1. Additional performance Security shall be obtained from the successful bidder when the bid amount is less than estimated cost put to tender/Project Cost put to bid. In such an event, only the successful bidder who has quoted bid price/ rates below 10% or more than the estimated cost put to tender/Project Cost put to bid shall have to furnish Additional performance Security (APS) computed in accordance with Works Department O.M. No. 173/W dated 03.01.2026 in shape of N.S.C./Post Office Savings Bank Account / Post Office Time Deposit Account / Kisan Vikas Patra/ Bank Guarantee in favour of the Divisional Officer from any Nationalized Scheduled Bank in India counter guaranteed by its local Branch at Bhubaneswar/ e-Bank Guarantee executed on the National e-Governance Services Limited (NeSL.) within seven days of issue of Letter of Acceptance (LoA) by the Divisional Officer (by e-Mail) 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, proceeding for Blacklisting shall be initiated against the bidder as per amendment to para 3.5.5(v) of OPWD Code, Volume-I vide Works Department Office [Memorandum No. 14459/W dated 20.09.2018].**
- 2. The Bidder must provide the mobile No. and e-mail ID along with the tender documents to intimate regarding date of conducting the Lottery (in the event of number of lowest bidders is more than one). No Paper Correspondence shall be made in this regard to avoid delay in finalization of tender. Status of the tenders will be displayed in the Notice Board of Division Office. (THIS OFFICE WILL NOT BE HELD RESPONSIBLE FOR NON INTIMATION IF THE BIDDER FAILS TO PROVIDE HIS/HER MOBILE NO./ e-mail ID.)**
- 3. Copy of valid VAT Clearance and GSTIN shall be uploaded along with the Tender documents for considering the Tender Non furnishing of VAT & GSTIN will lead to REJECTION of Bid.**
- 4. 2% GST to be deducted from work bills where agreement value exceeds Rs 2.50 Lakh. (to be applicable as per Government Notification).**
- 5. GST on works Contract as applicable at the time of payment shall be paid over and above the Gross amount of the Bill as per The Odisha GST Act 2017.**
- 6. Commercial invoice should be submitted by the Contractor at the time of preparation of the work Bill to the concerned Junior Engineer with a copy to the Division Office for enabling the Division to make necessary payment.**
- 7. Agreement shall be drawn only after due verification of EMD & APSD of the successful bidder and if any illegitimate instruments are found, Criminal proceedings will be initiated against the defaulting bidder and action will be initiated for Blacklisting through the License issuing Authority.**
- 8. The Contractor shall invariably maintained Bills & Vouchers in support of purchase and Procurement of Materials so that the quality of the work can be scrutinized as and when needs arises. [Ref: Works Department letter No. 3606/W dated 25.03.2022]**



**GOVERNMENT OF ODISHA
OFFICE OF THE SUPERINTENDING ENGINEER,
UPPER INDRAVATI LEFT CANAL DIVISION NO-I,
KUSUMKHUNTI, KALAHANDI, ODISHA
Email: eeuicd1kusumkhunti@gmail.com**

NOTICE INVITATION FOR BIDS (NIFB)

e-Procurement Notice No: SE, UILCD-I, 04(01)/ 2026-27, DATE: 03.09.2026

Lr. No. 2413

Date: 03.09.2026

1. The **Superintending Engineer, UI Left Canal Division No-I, Kusumkhunti, Dist: Kalahandi** on behalf of Hon'ble Governor of Odisha invites Online **percentage rate** tenders through e-procurement for execution of the following works. The bid should be submitted by eligible class of contractors Online in the Govt. website www.tendersodisha.gov.in. The bidders should have necessary portal enrolment with own digital signature certificate. The registered bidders outside of Odisha can also participate in this online tender process after necessary portal enrolment but shall have to subsequently undergo registration with the Odisha P.W.D within a month of acceptance of bid. The bidders may submit online bids for any or all of the following works.

Sl. No.	Bid Identification No.	Name of the works	Value of works (Rs. in lakh) excluding GST	Eligible Class of Contractor	Security/ E.M.D. Required (1%) (Rs.)	Cost of Bid Document (Rs.)	Period of completion	Name & address of the Division where the works will be executed
1	2	3	4	5	6	7	8	9
1	<u>SE, UILCD-I, 04(01)/ 2026-27, DATE: 03.09.2026</u>	Construction of Toilet Room at Division Office Building under UI Left canal Division No I , Kusumkhunti.	12.16	‘ D ’ & ‘ C ’ Class	12,200 /-	6000 /-	08 (Eight Calendar months)	S.E, U.I. Left Canal Division No. - I, Kusumkhunti

(One no. of work only)

2. Bidders registered themselves under CDMS portal can only participate in the bidding process after 31.12.2020 as per works department letter No. 9100, Dt. 17.07.2020.
3. Bid document consisting of qualification, information and eligibility criteria of bidders, plans, Specification and schedule of quantities of the works are available in web-site www.tendersodisha.gov.in and the set of terms and conditions of contract and other necessary documents can be seen in the web-site till last date of on-line bidding for the works.
4. As per Works Department, Government of Odisha, Office Memorandum No 8484 dated 05.04.2022 (As mentioned in above Column No- 7 and 6 respectively) should be submitted online through electronic receipt payment gateway mode of designated banks such as SBI/ICICI Bank/HDFC Bank as per works Department O.M No-17254//W on Dtd-05.12.2017 as mentioned in DTCN.)
5. 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 Bank shall not be held responsible for such pendency or failure.
6. Bidders registered in the e-Procurement Portal www.tendersodisha.gov.in can participate in the online bidding for any or all of the works mentioned in Col. 3 of the table.

CONTRACTOR

SUPERINTENDING ENGINEER

7. **e-procurement details :**

Procurement officer	Bid Identification No.	Availability of Bid On-line	Submission of Bid On-line	Date & time of opening of tender
1	2	3	4	5
Superintending Engineer, U.I. Left Canal Division No.-I, Kusumkhunti Dist.-Kalahandi.	<u>SE, UILCD-I, 04 (01)/ 2026-27, DATE: 03.09.2026</u>	From 10.09.2026, 10.00 A.M. to 21.09.2026, 5.00 P.M.	From 10.09.2026, 10.00 A.M. to 21.09.2026, 5.00 P.M.	22.09.2026 at 11.30 AM onwards at the O/o the Superintending Engineer, U.I. Left Canal Division No-I, Kusumkhunti, Dist-Kalahandi.

8. The bids validity period of the tender is for a period of 90 days from the last date of receipt of bids. If any bidder/ tenderer 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 shall stand forfeited.
9. Bid must be accompanied with scanned copies of valid Registration Certificate, valid GST Registration Certificate and PAN Card failing which the bid will be rejected. Bidders desirous to avail exemption / relaxation of E.M.D. as per prevailing rules should upload copies of necessary document and affidavit in support of their claim along with their bid. Bidders registered as “**Engineering Contractors**” desirous to avail exemption of E.M.D. for participating in bid shall have to upload an affidavit for not having availed this facility in three works (for Degree Engineering Contractors) and Two Works (For Diploma Engineering Contractor) during the year **2026-27**. In such case, the successful Engineering Contractor has to produce the original Registration Certificate for recording the fact of availing exemption of E.M.D. for award of the work. Bidders registered as “**S.C. & S.T. Contractors**” desiring to avail concession(s)/ price preference, may avail price preference as per the Resolution File No. 16262/ W dated 30.10.2018 of Works Department, Government of Odisha. He/ she must have to furnish the required affidavit online along with the tender document to avail the price preference, otherwise they will not be entitled to avail the facilities.
10. **No Exemption is allowed in EMD, Paper Cost, Performance security and any other deposits** to Contractors having MSME registered certificates, as per Notification no-MSME-1PE-MISC-0060-2019/566/MSME, Bhubaneswar, Dt-24.01.2024 from Micro, Small & Medium Enterprises Department, Govt. Of Odisha Clause No-4- “ MSME policy will, however, not applicable to procurement of services including work contracts (Including EPC contracts)” vide Office Memorandum Ltr No-4281/W dtd-05.03.2025 from Works Department, Govt. of Odisha.
11. If the rate quoted by the SC & ST Category Contractor comes to the rate quoted by the L1 bidder (decimal up to two numbers will be taken for all practical purposes) after availing 10% price preference as per Para-2 of Works Department Resolution No. 27748 dated 11.10.1977, the tender shall be finalized by the tender accepting authority through a transparent lottery system along with other categories of contractor as per Office Memorandum No. 07764600022025-632 BBSR dated 09.01.2026 of Works Dept. Govt. of Odisha.
11. The bidders shall have to upload an affidavit in support of authenticity of documents/ credential failing which the bid will be rejected. The authority reserves the right to verify the authenticity of documents in case of any doubt or complain.
12. **The bidder can submit only one tender paper for a particular work, submission of more than one tender paper by a bidder for a particular tender will liable rejection of all such tender papers as per works department Ltr. No. 4985/W Dtd. 28.03.2007.** The bidder can download the tender of his choice and save it in his system to undertake necessary Preparatory work off-line and upload the completed tender at his convenience before the closing date and time of submission Resubmission of bid by the bidders for any number of times before the final date and time of submission is allowed.
13. The Bids will be opened on-line on **22.09.2026 at 11.30 A.M onwards**, in the presence of the bidders who wish to attend if the office happens to be closed on the date of opening of the bids as specified, the bids will be opened subsequently on the next working day at the same time and venue.
14. No Engineer or Gazetted rank or other Gazetted officer employed in Engineering or Administrative duties in an Engineering department of the State Government is allowed to work as a contractor for a period of two years after his retirement from Government service, without Government permission.
15. The scanned copy of valid Contractors Registration Certificate, valid GSTIN Registration Certificate, PAN card and Affidavits, including all required papers should be uploaded in web-site and submitted at the time of online submission of Bid. **All the Bidders are to provide their Mobile Number , e-mail ID and Address at the time of Submission of the Original documents for communication regarding the tender.**

16. The O/o The Superintending Engineer, U.I. Left Canal Division No. -I, Kusumkhunti, Dist-Kalahandi may be Communicated during the office hours on any working days for any further clarification between **03.09.2026 to 21.09.2026** during office hours (**i.e. 10.00:00 AM to 05:00 PM**) only.
17. Other details can be seen in the bidding documents, which is available in web-site www.tendersodisha.gov.in
18. Authority reserves the right to reject any or all the tenders without assigning any reasons thereof.
19. **Additional performance security** shall be taken on an incremental basis from the selected bidder for low prices in project works as under. As per Office Memorandum No. 07764600022025-173 BBSR dated 03.01.2026 of Works Dept. Govt. of Odisha.
 - i) Where the bid price is below 0% but not below 10% of the project cost put to bid, no additional performance guarantee/ security percentage required.
 - ii) Where the bid price is below 10% but not below 20% of the project cost put to bid, the additional performance guarantee/ security percentage shall be incremented by 0.1% for every percentage of bid price below 10% of the project cost put to bid starting at 11% with the additional bid performance guarantee being 0.1% and this additional performance guarantee percentage shall be applied on the bid price.
 - iii) Where the bid price is 20% or more below of the project cost put to bid, the additional performance guarantee percentage shall be incremented by 0.2% for every percentage of bid price 20% of project cost to bid in addition to 1% of the bid price and this additional performance guarantee percentage shall be applied on the bid price.
 - iv) The additional performance guarantee percentage shall be rounded off to the next lower percentage based on whether the decimal point of the percentage of bid price is below 0.5% of next higher percentage based on whether the decimal point of the percentage of bid price is 0.5% or more.
 - v) The additional performance security shall be treated as part of the performance security.
 - vi) In case of abnormally low bids the Procuring Entity may in such cases, seek written clarification from the bidder about the capability to deliver the contract at his offered price. However it would not be satisfactory, the tender inviting authority may be rejected the bid proposal.
20. Bidder has to furnish the running bill along with commerce invoice at the time of billing.
21. Statutory TDS deduction shall be made as applicable.
22. If there is more than one valid lowest bidder for any work the tender will be finalized through a **transparent Lottery system**, if required which will be intimated later. The activity will be done with the presence of all bidders/their authorized representatives, the Superintending Engineer and Divisional Accounts Officer. If the office happened to be closed on the above date the same will be drawn on the next working day at the same time and venue.

Sd/-

Superintending Engineer,
U.I. Left Canal Division No. -I
Kusumkhunti

Memo No. 2414

/ Dated: 03.09.2026

Copy submitted to the PA to Additional Chief Secretary to Government, Department of Water Resources, Odisha / the Engineer-in-Chief, Department of Water Resources, Bhubaneswar, Odisha for favour of kind information & necessary action.

Sd/-

Superintending Engineer,
U.I. Left Canal Division No. -I
Kusumkhunti

Memo No. 2415

/ Dated: 03.09.2026

Copy submitted to the Chief Engineer & Basin Manager, IKB, Bariniput, Koraput / Chief Construction Engineer, UIP, Mukhiguda, Kalahandi for favour of kind information & necessary action.

Sd/-

Superintending Engineer,
U.I. Left Canal Division No. -I
Kusumkhunti

CONTRACTOR

SUPERINTENDING ENGINEER

Memo No. 2416

/ Dated: 03.09.2026

Copy along with hard copy and soft copy (Through E-mail) of the e-Procurement Notice submitted to the Chief Engineer (M & E), O/o Engineer-in-Chief, Procurement, Odisha, Bhubaneswar for information and necessary action with a request to hoist the e-Procurement Notice in DoWR website (www.tendersodisha.gov.in) on or before 23.05.2026.

Sd/-

Superintending Engineer,
U.I. Left Canal Division No. -I
Kusumkhunti

Memo No. 2417

/ Dated: 03.09.2026

Copy submitted to the Collector & District Magistrate, Kalahandi, Bhawanipatna/ Superintendent of Police, Kalahandi , Bhawanipatna for favour of kind information & necessary action..

Sd/-

Superintending Engineer,
U.I. Left Canal Division No. -I
Kusumkhunti

Memo No. 2418

/ Dated: 03.09.2026

Copy submitted to the Police - in - Charge, Koksara, Police Phandi, Moter for information & necessary action. He / She Is requested to extend his/her co-operation for maintaining law and order on the above mentioned dates.

Sd/-

Superintending Engineer,
U.I. Left Canal Division No. -I
Kusumkhunti

Memo No. 2419

/ Dated: 03.09.2026

Copy submitted to all the Superintending Engineers / Executive Engineers under UIP , Mukhiguda F.A & C.A.O, U.I.I.P, Mukhiguda, Liaison Officer, UIP, Bhubaneswar for information & necessary action. And all the SDOs under Upper Indravati Left Canal Division No.- I, kusumkhunti/ DAO/ HC/ Estimator/ Cashier/ Auditor/ Notice Board for information and wide circulation.

Sd/-

Superintending Engineer,
U.I. Left Canal Division No. -I
Kusumkhunti

CONTRACTOR

SUPERINTENDING ENGINEER

PARTICULARS OF TENDER

1.	Name of the work	:	Construction of Toilet Room at Division Office Building under UI Left canal Division No I , Kusumkhunti.
2.	Amount Put to Tender	:	Rs. 12,16,048.41 /- (Excluding GST)
3.	E.M.D.	:	Rs. 12,200 /- (Online)
4.	Period of Completion.	:	08 (Eight) Calender Months
5.	Class of Contractor	:	Registered Construction firm of D & C CLASS Registered under Govt. of Odisha & other eligible classes registered elsewhere mentioned in Tender call Notice.
6.	Cost of tender document	:	Rs. 6000 /- (Non-refundable) for Bid Documents
7.	Availability of Tender in web site	:	From 10.09.2026, 10.00 AM to 21.09.2026, 05.00 PM
8.	Bidding Period Starts from	:	From 10.09.2026, 10.00 AM to 21.09.2026, 05.00 PM
9.	Date of opening of Tender	:	At 11.30 A.M. on 22.09.2026 in the office of the Superintending Engineer, U.I. Left Canal Division No.- I, Kusumkhunti, Dist- Kalahandi, Odisha, Pin-766017.

CONTRACTOR

SUPERINTENDING ENGINEER

INFORMATION AND INSTRUCTION TO BIDDERS

1. E - Procurement

The bidders desirous to participate in “**on-line**” bidding must possess compatible **Digital Signature Certificate of Class II or Class III**. The web site for on-line bidding is **<http://tendersorissa.gov.in>**.

2. General

Forms for bid and letter of Transmittal are attached herewith. All information required, for the enclosed forms should be furnished. If any particulars query is not relevant it should be stated as ‘Not applicable’. However, the tenderers are cautioned that giving incomplete information in the tender or making any change in the prescribed forms may render the tender non-responsive.

Reference information and certificates furnished along with the tender for the respective owner certifying the suitability, technical know how or capability of the tender should be signed by the owner.

The tenderer is to attach any additional information which he thinks are necessary in regard to his capabilities. No further information will be entertained after submission of bid document unless it is called for by the Government of Odisha

The condition of this bid document shall eventually be a component of Agreement.

Site Visit

The Project site may be inspected by the tenderer or his authorized representative at his own cost with prior appointment with the Superintending Engineer, U.I. Left Canal Division No. -I, Kusumkhunti

3. General Specification

The work is to be executed in accordance with the Odisha standard specification & Technical specification mentioned in financial Bid documents. Quality Standards of Bureau of Indian standard specification is to be followed.

4. Language of bid documents

All information as called for in the bid documents shall be furnished in English. All literature and correspondences in connection with bid shall also be in English. In case of amount, it has to be shown in both word and figures in English.

5. Preparation of bid

The intending bidders shall upload the scanned copy of documents, certificates, deposit receipts, affidavits form duly digitally signed for the bid. All the information called for should be furnished. No change to the forms will be accepted. Over writing or corrections must be initialed by the intending tenderer.

6. Bid Prices

In case of submission of Bids through the E-Procurement Portal, an intelligent Bill of Quantity in Microsoft Excel format shall be made available to the bidder. The bidder shall download that particular excel sheet and fill in the rates in figures at the appropriate locations. The line-item total in words and the total amount in case of item rate tenders shall be calculated automatically and shall be visible to the bidder. In case of percentage tender, the bidder will only fill in the designated cell and activate “less” or “excess” to indicate whether his/her price offer is how much excess or less than the estimate amount. The bidder is not supposed to change or modify the format of the excel sheet in any form. The Bidders shall quote the percentage up to one decimal point only.

7. Method of submission of bid Documents

The original copy of documents, certificates, deposit receipts, affidavits, should be physically produced before the Office inviting Tender on being declared as successful after opening of the bid. They should digitally sign on all statements, documents, certificates uploaded by them, owning responsibility for their correctness/ authenticity. The authority reserves the right to verify the authenticity of documents incase of any doubt or complain.

- 7.1** If the intending tenderer is an individual, the documents shall be signed by the individual above his full type written name and current address.
- 7.2** If the intending tender is a proprietary firm, it shall be signed by the proprietor above his full name and with his current address.
- 7.3** 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 technical bid documents.
- 7.4** 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
- 7.5** 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.

8. Opening of bid Documents

The bid documents will be opened by the Superintending Engineer, U.I. Left Canal Division No. -I, Kusumkhunti on the date and time notified in the tender notice in the presence of tenderer or his representative who chose to be Present.

9. Final Decision-making authority

The competent authority reserves the right to accept or reject bid without assigning any reasons and its decision shall be final.

10. Further Clarification

The Superintending Engineer, U.I. Left Canal Division No. -I, Kusumkhunti may be contacted during office hours on any working days for any further clarification regarding bid criteria

GOVERNMENT OF ODISHA

WORKS DEPARTMENT

Office Memorandum

File No 07556900042013(Pt-II) – 7885 / W, Dated 23.07.2013

Sub: Codal Provision regarding e-procurement

1. This office memorandum consists of the procedural requirement of e-procurement and shall be made part of the Detailed Tender Call Notice or Instruction to Bidder for all “Works” tenders hoisted in the portal.
2. The e-procurement portal of the Government of Odisha is <https://tendersodisha.gov.in>
3. Use of Valid Digital signature Certificate of appropriate class (Class II or Class III) issued from registered Certifying Authorities (CA) as stipulated by Controller of Certifying Authorities (CCA), Government of India such as n-Code, Sify, TCS, MTNL, e-Mudhra etc is mandatory for all users.
4. The DSC issued to the Department users is valid for the period of two years only. All the Department users are responsible to revalidate their DSC prior to expiry.
5. For all purpose, the server time displayed in the e-Procurement portal shall be the time to be followed by all the users.
6. Government after careful consideration have decided to hoist all tenders costing 10 lakhs or above in the e-procurement portal (After amendment Its limit changed to 5 Lakhs). This will be applicable across all Engineering Departments such as Works Department, Department of Water Resources, Rural Development and Housing & Urban Development Department. Government of Odisha also welcomes hosting of tenders by any other departments, authority, corporations, local bodies etc. of the State with prior approval from Works Department. Works Department is the Nodal Department for the implementation of e-Procurement in the State.
7. The e-procurement shall be operated complaint to relevant provisions of OGFR / OPWD Code / Accounts Code / Government statutes including any amendments brought from time to time to suit to the requirement of the best national practice.
8. Registration in the e-procurement portal is without levy of any charges but Government reserves the right to levy any charges for such value added services in future.
9. Contractor not registered with Government of Odisha, can participate in the e-Procurement after necessary enrolment in the portal but have to subsequently register themselves with the appropriate registering authority of the State Government before award of the work as per prevalent registration norms of the State.
10. For the role management “Department” is the Administrative Department, Organization or wing is the Chief Engineer or highest tender accepting authority or equivalent officer, Division is the Superintending Engineer or equivalent Officer and Subdivision is the Assistant Engineer or equivalent officer.
11. The e-procurement software assigns roles for operation of the module for specific function. The terminologies used in the portal and their respective functions in the software are as follows:
 - 11.1 Application Administrator (NIC & State Procurement Cell)
 - i. Master Management
 - ii. Nodal Officer Creation
 - iii. Report Generation
 - iv. Transfer of officer’s login ID
 - v. Blocking & unblocking of officer’s and bidder’s login ID
 - 11.2 Nodal Officer (At organization Level not below the Superintending Engineer or equivalent rank)
 - i. Creation of Users
 - ii. Role Assignment
 - iii. Report Generation.
 - iv. Transfer of Officer’s login ID
 - v. Blocking & unblocking of officer’s Login ID
 - 11.3 Procurement Officer-Publisher (Officer having tender inviting power at any level)
 - i. Publishing of Tender
 - ii. Publishing of Corrigendum / addendum / cancellation of Tender.
 - iii. Bid Clarification
 - iv. Uploading of Pre-Bid minutes.

CONTRACTOR

SUPERINTENDING ENGINEER

- v. Report generation.
- 11.4 Procurement Officer – Administrator (Generally sub-ordinate officer to Officer inviting Tender.)
 - i. Creation of Tender
 - ii. Creation of corrigendum / addendum / cancellation of tender.
 - iii. Report generation.
- 11.5 Procurement Officer Opener (Generally sub-ordinate officer to officer inviting the tender).
 - i. Opening of Bid
- 11.6 Procurement Officer Evaluator (Generally sub-ordinate officer to officer Inviting the Tender).
 - i. Evaluating Bid.
- 11.7 Procurement officer – Auditor (Procurement Officer Publisher and / or Accounts Officer / Finance Officer).
 - i. To take up auditing.

12 NOTICE INVITING BIDS (NIB) OR INVITATION FOR BID (IFB)

- 12.1 The Notice Inviting Bids (NIB) and Bid documents etc. shall be in the standard formats as applicable to conventional Bids and will be finalized / approved by the officers competent as in the case of conventional Bids.
- 12.2 The officer competent to publish NIB in case of conventional Bids will hoist the NIB in the portal. Simultaneously, a notification should also be published in the newspapers, as per existing rules preferably, in the following format to effect economy.

Government of Odisha “e” procurement Notice No. **SE, U.I.LCD No. -I – 04(01)/ 2026-27**
 Bid Identification No.: **SE, U.I.LCD No. -I – 04(01)/ 2026-27**

- 1. Name of the work “ **Construction of Toilet Room at Division Office Building under UI Left canal Division No I , Kusumkhunti.**”
- 2. Estimated Cost Rs. 12.16 Lakhs
- 3. Period of completion - 08 (Eight) Calendar Months
- 4. Date & time of availability of bid documents in the portal- As Per e-Procurement Notice
- 5. Last date /Time for receipt of bids in the portal - As Per e-Procurement Notice
- 6. Name and address of the Officer Inviting Bid -O/o The Superintending Engineer, Upper Indravati Left Canal Division No. - I, Kusumkhunti, Dist- Kalahandi

Further details can be seen from the e-procurement portal <https://tenderodishagov.in>

- 12.3 The tender documents published by the Tender Inviting Officer (Procurement Officer Publisher) in the website <https://tenderodishagov.in>. will appear in the “Latest Active Tenders”. The Bidders / Guest Users can download the Bid documents only after the due date and time of sale. The publication of the tender will be for specific period of time till the last date of submission of bids as mentioned in the “Notice Inviting Bid” after which the same will be removed from the List of Latest Active Tenders.

13 ISSUE OF ADDENDA / CORRIGENDA / CANCELLATION NOTICE.

- 13.1 The Procurement Officer Publisher (Officer Inviting tender) shall publish any addendum /corrigendum / cancellation of tender in the website <https://tenderodishagov.in> , notice board and through paper publication and such notice shall form part of the bidding documents.
- 13.2 The system generates a mail to those bidders who have already uploaded their tenders and those bidders if they wish can modify their tenders. The bidders are required to watch the website till last date and time of bid submission for any addendum1 corrigendum cancellation thereof. Tender inviting Authority is not responsible for communication failure of system generated mail.
- 14. **CREATION AND PUBLISHING OF BID:**
- 14.1 All the volumes documents shall be uploaded in the portal by the tender creating officer (Procurement Officer Administrator) and published by the Officer inviting Tender Procurement Officer Publisher) using their DSCs in appropriate format so that the document is not tampered with.
- 14.2 The tender document comprise the notice inviting tender, bid document / SBD, drawings in .pdf format and the schedule of quantities I BOQ in .xls format to be uploaded by the Officer Inviting Tender.

14.3 Procurement Officer Administrator creates tender by filling up the following forms:

- i. **BASIC DETAILS:**
- ii. **COVER CONTENT:** The Procurement officer Administrator should briefly describe the name and type of documents to be uploaded by the bidder in the following format:

(a) For Single Cover / Packet:

Sl No	Cover Type	Document Description	Type
1	Fee/prequel/Technical / Finance	GSTIN, PAN Contractor RC	.pdf
		Affidavits, undertaking and any other documents as per SBD/DTCN	.pdf
		BOQ	.xls

b). For Two Cover / Packet

Sl No	Cover Type	Document Description	Type
1	Fee/prequel/Technical / Finance	GSTIN, PAN Contractor RC	.pdf
		Affidavits, undertaking and any other documents as per SBD/DTCN	.pdf
2	Finance	BOQ	.xls
		Special Condition if any specifying mentioned by Officer Inviting tender	.pdf

iii. **TENDER DOCUMENT:** -The Procurement Officer Administrator should upload the NIT in .pdf format.

iv. **WORK ITEM DETAILS:**

v. **FEE DEATAILS:** The Procurement Officer Administrator should mention the cost of tender paper and EMD amount to be paid online as per Works Department Office Memorandum No. 6785/W dtd. 09.05.2017 and as laid down in DTCN/SBD.

vi. **CRITICAL DATES:** The Procurement Officer Administrator should mention the critical dates of tender such as publishing date, document download start date & end date, seek clarification start date & end date (optional), bid submission start date & closing date, bid opening date as per DTCN / SBD.

vii. **BID OPENER SELECTION:** The Procurement Officer creator can select two /three / four bid openers for a particular bid. If required the bid openers can also be selected within an organization from other procurement units (Circles / Divisions).

viii. **WORK ITEM DOCUMENTS:** The Procurement Officer Administrator should upload the digitally signed tender document (SBD / DTCN) or any other addition document / drawings in .pdf format and Bill of Quantities in .xls format.

ix. **PUBLISHING OF TENDER:** The Procurement Officer Publisher shall publish the tender using his/her DSC after detail scrutiny of the fields created and documents uploaded by the Procurement Officer Administrator. Procurement Officer Publisher can publish tenders for multiple procurement units using multiple DSCs procured for each post separately. After being relieved from the additional charges he has to surrender the additional DSCs to the Nodal Officer of the concerned organization.

15. **PARTICIPATION IN BID.**

15.1 **PORTAL REGISTRATION:** The Contractor / Bidder intending to participate in the bid is required to register in the portal using his / her active personal / official e-mail ID as his / her Login ID and attach his / her valid Digital signature certificate (DSC) to his/ her unique Login ID. He / She has to submit the relevant information as asked for about the firm / contractor. The portal registration of the bidder / firm is to be authenticated by the State Procurement Cell after verification of original valid certificates / documents such as (i) PAN and (ii) Registration Certificate (RC) / GSTIN Clearance Certificate (for procurement of goods) of the concerned bidder. The time period of validity in the portal is as per with validity of RC / GSTIN Clearance. Any change of information by the bidder is to be re-authenticated by the State Procurement Cell. After successful authentication bidder can participate in the online bidding process.

15.1.1 Bidders participating through Joint Venture shall declare the authorized signatory through Memorandum of Understanding duly registered and enroll in the portal in the name and style of the Joint venture Company. It is mandatory that the DSC issued In the name of the authorized signatory is used in the portal.

- 15.1.2 Any third party / company / person under a service contract for operation of e-Procurement system in the State or his / their subsidiaries or their parent companies shall be ineligible to participate in the procurement process that are undertaken through the e- Procurement system irrespective of who operates the system.
- 15.2 **LOGGING TO THE PORTAL** – The Contractor / Bidder is required to type his/her Logging ID and password. The system will again ask to select the DSC and confirm it with the password of DSC as a second stage authentication. For each login, a user's DSC will be validated against its date of validity and also against the Certificate Revocation List (CRL) of respective CAs stored in system database. The system checks the unique Login Id, password and DSC combination and authenticates the login process for use of portal.
- 15.3 **DOWNLOADING OF BID** – The bidder can download the tender of his choice and save it in his system to undertake necessary preparatory work off-line and upload the completed tender at his convenience before the closing date and time of submission.
- 15.4 **CLARIFICATION ON BID**: The bidder may ask question related to tender online in the e-procurement portal using his/her DSC; provided the questions are raised within the period of seeking clarification as mentioned in tender call notice/Bid. The officer inviting the bid / Procurement Officer- Publisher will clarify queries related to the tender.
- 15.5 **PREPARATION OF BID**:
- 15.5.1 The bids may consist of general arrangements drawings or typical or any other drawings relevant to the work for which bid has been Invited Bidders may down load these drawings and take out the print for detail study and preparation of his bid. Any other drawings and documents pertaining to the works available with the Officer Inviting the Bid will be open for inspection by the bidders.
- 15.5.2 The Bidder shall go through the Bid carefully and list the documents those are asked for submission. He shall prepare all documents including Declaration Form, Price Bid etc. and store in the system.
- 15.6 **PAYMENT OF EMD / BID SECURITY AND COST OF BID DOCUMENTS**.
- 15.6.1 The bidder shall transfer the Tender Paper Cost online as part of its Bid, as mentioned under DTCN/SBD through a process mentioned in Works Department Office Memorandum No. 6785/W dtd. 09.05.2017.
- 15.6.2 Also, the Bidder shall transfer the EMD/BID Security online as part of its Bid, as mentioned under DTCN/SBD through a process mentioned in Works Department Office Memorandum No. 6785/W dtd. 09.05.2017. The Bidder shall also have to furnish as part of its Bid, the Additional Performance Security (If any) as mentioned in the DTCN/SBD and as per the Para -3.5.5(V) of Note –II of OPWD Code, Vol-I modified by works department office Memorandum No. 5288/W dtd. 04.05.2016, which is to be paid online through a process mentioned in Works Department Office Memorandum No. 6785/W dtd. 09.05.2017.
- 15.6.3 Deleted.
- 15.6.4 The tender accepting authority will verify the originals of all the scanned documents of the successful lowest bidder only within 5 days of opening of the tender. In the eventuality of failure on the part of, the lowest successful bidder to produce the original documents, he will be debarred in future from participating in tender for 3 years and will be black listed by the competent authority. In such a situation, successful L-2 bidder will be required to produce his original documents for consideration of his tender at the negotiated rate equal to L1 bidder.
- 15.6.5 Contractor exempted from payment of EMD will be able to participate in the tender directly by uploading documentary evidences towards his eligibility for such exemption
- 15.6.6 Deleted
- 16 SUBMISSION OF BID.**
- 16.1 The bidder shall carefully go through the tender and prepare the required documents. The bid shall have a Technical Bid and a Financial Bid. The technical Bid generally consist of GSTIN, PAN, Registration Certificate, Affidavits, Profit Loss statement, Joint venture agreement, List of similar nature works, work in hand, list of machineries, and any other information required by OIT. The financial Bid shall consist of the Bill of Quantities (BOQ) and any other price related information / undertaking including rebates.

- 16.2 Bidders are to submit only the original BOQ (in .XIS format) uploaded by Procurement Officer Publisher (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 case of item rate tender, bidders shall fill in their rates other than zero value in the specified cells without keeping it blank. 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.
- 16.3 The Bidder shall up load the scanned copy / copies of documents in support of eligibility criteria and qualification information in prescribed format in Portable Document Format (PDF) to the portal in the designated locations of Technical Bid.
- 16.4 The bidder shall write his 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 type rates in figure only in the rate column of respective item(s) without any blank cell in the rate column in case of item rate tender and type percentage excess or less up to two decimal places only in case of percentage rate tender.
- 16.5 The bidder shall log on to the portal with his/her DSC and move to the desired tender for uploading the documents in appropriate place one by one simultaneously checking the documents.
- 16.5.1 Bids cannot be submitted after due date and time. The bids once submitted cannot be viewed, retrieved or corrected. The bidder should ensure correctness of the bid prior to uploading and take print out of the system-generated summary of submission to confirm successful uploading of bid. The bids cannot be opened even by the OIT or the Procurement Officer-Publisher/opener before the due date and time of opening.
- 16.5.2 Each process in the e-procurement is time stamped and the system can detect the time of log in of each user including the Bidder.
- 16.5.3 The Bidder should ensure clarity / legibility of the document uploaded by him to the portal.
- 16.5.4 The system shall require all the mandatory forms and fields filled up by the contractor during the process of submission of the bid / tender.
- 16.5.5 The bidder should check the system generated confirmation statement on the status of the submission.
- 16.5.6 The Bidder should upload sufficiently ahead of the bid closure time to avoid traffic rush and failure in the network.
- 16.5.7 The Tender Inviting Officer is not responsible for any failure, malfunction, or breakdown of the electronic system used during the e-procurement process.
- 16.5.8 The Bidder is required to up load documents related to his eligibility criteria and qualification information and Bill of Quantities duly filled in. It is not necessary for the part of the Bidder to up-load the drawings and other Bid documents (after signing) while up-loading his bid. It is assumed that the bidder has referred all the drawings and documents uploaded by the Officer Inviting the Bid.
- 16.5.9 The Bidder will not be able to submit his bid after expiry of the date and time of submission of bid (server time). The date and time of bid submission shall remain unaltered even if the specified date for the submission of bids declared as a holiday for the Officer Inviting the Bid.
- 16.6 SIGNING OF BID: 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 and his registration in the portal shall be blocked and the bidder is liable to be blacklisted.

17 SECURITY OF BID SUBMISSION:

- 17.1 All bid uploaded by the bidder to the portal will be encrypted.
- 17.2 The encrypted Bid can only be decrypted/opened by the authorized openers on or after the due date and time.

18 RESUBMISSION AND WITHDRAWAL OF BIDS:

- 18.1 Resubmission of bid by the bidders for any number of times before the final date and time of submission is allowed.
- 18.2 Resubmission of bid shall require uploading of all documents including price bid afresh.
- 18.3 If the bidder fails to submit his modified bids within the pre-defined time or receipt, the system shall consider only the last bid submitted.
- 18.4 The bidder should avoid submission of bid at the last moment to avoid system failure or malfunction of Internet or traffic jam or power failure etc.

- 18.5 The Bidder can withdraw his bid before the closure date and time of receipt of the bid by uploading scanned copy of a letter addressing to the Procurement Officer-Publisher (Office Inviting Tender) citing reasons for withdrawal. The system shall not allow any withdrawal after expiry of the closure time of the bid.

19 OPENING OF THE BID

- 19.1 Bid opening date and time is specified during tender creation or can be extended through corrigendum. Bids cannot be opened before the specified date and time.
- 19.2 All bid openers have to log on to the portal to decrypt the bid submitted by the bidders.
- 19.3 The bidders & guest users can view the summary of opening of bids from any system. Contractors are not required to be present during the bid opening at the opening location if they so desire.
- 19.4 In the event of the specified date of bid opening being declared a holiday for the Officer Inviting Bid, the bids will be opened at the appointed time on the next working day.
- 19.5 Combined bid security for more than one work is not acceptable.
- 19.6 The electronically submitted bids may be permitted to be opened by the predefined Bid-opening officer from their new location if they are transferred after the issue of Notice Inviting Bid and before bid opening. Further action on bid documents shall be taken by the new incumbent of the post.
- 19.7 In case of non-responsive tender, the officer inviting tender should complete the e-Procurement process by uploading the official letter for cancelled / re-tender.

20 EVALUATION OF BIDS.

- 20.1 All the opened bids shall be down loaded and printed for taking up evaluation. The Officer authorized to open the tender shall sign and number on each page of the documents downloaded and furnish a certificate that "the documents as available in the portal containing 137 nos of pages"
- 20.2 The bidder may be asked in writing/ online (in their registered e-mail ids) to clarify on the uploaded documents provided in the Technical Bid, if necessary, with respect to any doubts or illegible documents. The Officer Inviting Tender may ask for any other document of historical nature during Technical Evaluation of the tender. Provided in all such cases, furnishing of any document in no way alters the Bidder's price bid. Non submission of legible documents may render the bid non-responsive. The authority inviting bid may reserve the right to accept any additional document.
- 20.3 The bidders will respond in not more than 7 days of issue of the clarification letter, failing which the bid of the bidder will be evaluated on its own merit.
- 20.4 The Technical evaluation of all the bids shall be carried out as per information furnished by Bidders.
- 20.5 The Procurement Officer-Evaluators; will evaluate bid and finalize list of responsive bidders.
- 20.6 The financial bids of the technically responsive bidders shall be opened on the due date of opening. The Procurement Officer-Openers shall log on to the system in sequence and open the financial bids
- 20.6.1 The Financial Bid will be opened on the notified date & time in the presence of bidders or their authorized representative who wish to be present.
- 20.6.2 At the time of opening of "Financial Bid", bidders whose technical bids were found responsive will be opened.
- 20.6.3 The responsive bidders' name, bid prices, item wise rates, total amount of each item in case of item rate tender and percentage above or less in case of percentage rate tenders will be announced.
- 20.6.4 Procurement Officer-Openers shall sign on each page of the downloaded BoQ and the Comparative Statement and furnish a certificate to that respect.
- 20.6.5 Bidder can witness the principal activities and view the documents / summary reports for that particular work by logging on to the portal with his DSC from anywhere.
- 20.6.6 System provides an option to Procurement Officer Publisher for reconsidering the rejected bid with the approval of concern Chief Engineer 1 Head of Department.

21 NEGOTIATION OF BIDS

- 21.1 For examination, evaluation, and comparison of bids, the officer inviting the bid may, at his discretion, ask the lowest bidder for clarification of his rates including reduction of rate on negotiation and breakdown of unit rates.

22 NOTIFICATION OF AWARD AND SIGNING OF AGREEMENT.

- 22.1 The Employer/Engineer-in-charge shall notify acceptance of the work prior to expiry of the validity period by cable, telex or facsimile or e-mail confirmed by registered letter. This Letter of Acceptance will state the

sum that the Engineer-in-Charge will pay the contractor in consideration of the execution and completion of the Works by the contractor as prescribed by the contract and the amount of Performance Security and additional Performance security required to be furnished. The issue of the letter of acceptance shall be treated as closure of the Bid process and commencement of the contract.

- 22.2 The Contractor after furnished the required acceptable performance security and additional performance security “Letter to Proceed” or “Work order” shall be issued by the Engineer-in-charge with copy thereof to the Procurement Officer-Publisher. The Procurement Officer-Publisher shall up load the summary and declare the process as complete.
- 22.3 If the L-1 bidder does not turn up for agreement after finalization of the tender, then he shall be debarred from participation in bidding for three years and action will be taken to blacklist the contractor. Besides the consortium /JV / firm where such an agency / firm already happens to be or is going to be a partner/member/proprietor, he/ they shall neither be allowed for participation in bidding for three years nor his/ their application will be considered for registration and action will be initiated to blacklist him / them. In that case, the L-2 bidder, if fulfils other required criteria, would be called for drawing agreement for execution of work subject to condition that the L-2 bidder negotiates at par with the rate quoted by the L-1 bidder, otherwise the tender will be cancelled.

23. BLOCKING OF PORTAL REGISTRATION:

- 23.1 If the Registration Certificate of the Contractor is cancelled /suspended by the registering authority/blacklisted by the competent authority his portal registration shall be blocked automatically on receipt of information to that effect.
- 23.2 The portal registration blocked in the ground mentioned in ,the above Para-23.1 shall be unblocked automatically in receipt of revocation order of cancellation / suspension/blacklisting from the concerned authority.
- 23.3 The Officer Inviting Tender shall make due inquiry and issue show cause notice to the concerned contractor who in turn shall furnish his reply, if any, within a fortnight from the date of issue of show cause notice. Thereafter the Officer inviting Tender is required to issue an intimation to the defaulting bidder about his unsatisfactory reply and recommend to the Chief Manager (Tech.) for blocking of portal registration within 10 days of intimation to the defaulting bidder regarding his unsatisfactory reply with intimation to the Registering Authority and concerned Chief Engineer/ Heads of Office if any of the following provisions are violated.
- 23.3.1 Fails to furnish original Technical Documents before the designated officer within the stipulated date and time.
- 23.3.2 Backs out from the bid on any day after the last date of receipt of tender till expiry of the bid validity period.
- 23.3.3 Fails to execute the agreement within the stipulated date.
- 23.3.4 If any of the information furnished by the bidder is found to be false /fabricated / bogus. Accordingly the Officer Inviting Tender shall recommend to the Chief Manager (Tech.), State Procurement Cell, Odisha for blocking of portal registration of bidder and simultaneously action shall also be initiated by OFFICER INVITING TENDER for blacklisting as per Appendix- XXXIV of OPWD Code, Volume-II.

24. GUIDELINES FOR UNBLOCKING OF PORTAL REGISTRATION:

- 24.1 **UNBLOCKING OF PORTAL REGISTRATION:**
Unblocking of portal registration of a contractor shall be done by a Committee consisting of the following members.
EIC (Civil)-cum-CPO, - Chairman
Engineer-in-Chief (WR) - Member
Concerned Chief Engineer - Member
Sr. Manager (Finance), SPC - Member
Officer Inviting Tender - Member
Chief Manager (Technical), SPC- Convener
- 24.2 The Chief Manager (Tech), State Procurement Cell will be the convener and he will maintain all records for this purpose. The Committee shall meet not less than once in a month if required & shall consider the recommendation of the officer inviting tender for unblocking of portal registration. The quorum of the meeting will be four.
- 24.3 The minimum period of blocking of Portal Registration shall in no case be less than 180 days. After blocking of Portal Registration, the Contractor whose Portal Registration has been blocked may file application to the

concerned officer inviting tender showing sufficient ground for unblocking of his portal registration along with a Treasury Challan showing deposit of Rs. 10,000/- (Rupees ten thousand) only (nonrefundable) under the head of accounts '0059 - Public Works' as processing fees. The officer inviting tender shall forward the application filed by the contractor to the Chief Manager (Tech), State Procurement Cell.

- 24.4 On receipt of recommendation from the concerned Chief Engineer along with the copy of challan as mentioned above, the Chief Manager (Tech) being the member Convener of the Committee shall place the case before the Committee for examination and taking a decision in this regard. After examination the Committee may recommend for unblocking of the portal registration of said contractor if the Committee is satisfied that the fault committed by the contractor is either unintentional or done for the first time.
- 24.5 After scrutiny by the State Procurement Cell if it is found that the portal registration of a contractor has been blocked for the 2nd time the Chief Manager (Tech), SPC may not consider his case to be placed before the Committee and may advise the concerned officer inviting tender to issue show cause notice to the contractor asking him to explain as to why his portal registration shall not remain blocked. On receipt of show cause reply from the contractor the officer inviting tender shall examine the same & if considered proper he may report to the Chief Manager (Tech), SPC along with his views furnishing the copy of the show cause reply for placement of the same before the Committee for taking a decision in respect of blocking / unblocking. If the Committee found that the contractor is in habit of committing such fault again and again intentionally the committee may advise the concerned officer inviting tender to initiate proceeding for blacklisting as per the existing rule.

Sd-

EIC-Cum Secretary to Government

LETTER OF TRANSMITAL

To

The Superintending Engineer
U.I. Left Canal Division No. -I, Kusumkhunti.

Sub : Submission of bid for the work " **Construction of Toilet Room at Division Office Building under UI Left canal Division No I , Kusumkhunti.**"

Sir,

Having examined the details given in invitation and bid for the work "**Construction of Toilet Room at Division Office Building under UI Left canal Division No I , Kusumkhunti**".

I/we hereby submit the bid information and relevant documents.

2. We hereby certify that all the statements made as information supplied in the enclosed forms and Annexure are true and correct.
3. We have furnished all information and details necessary as per check list for bid and have no further pertinent information to supply.
4. We submit the requisite certified liquid asset/ credit facility certificate and authorize the Superintending Engineer, U.I. Left Canal Division No. -I, Kusumkhunti to approach the Bank issuing the Liquid asset/credit facility certificate to verify the correctness thereof. We also authorize the Superintending Engineer, U.I. Left Canal Division No. -I, Kusumkhunti to approach individuals, employers, firms and corporations to verify our competence and general reputation.
5. We submit the following certificates in support of our suitability, technical knowledge, and capability for having successfully completed the following works.
6. We submit requisite affidavit as mentioned in Tender Call Notice.

Name of work.

Client / Owner

1.

2.

3.

Enclosures:

Signature of Tenderer

Seal of Tenderer

Date of submission

CONTRACTOR

SUPERINTENDING ENGINEER

CERTIFICATE OF NO-RELATIONSHIP

I/We hereby certify that I/We* am/are* **related / not related** to any officer of Water Resources Department of the rank of Assistant Engineer & above and any officer of the rank of Assistant/ Under and above Secretary of the Water Resources Department Govt. of Odisha I/We * am/are* aware that, if the facts subsequently proved to be false, my/our* contract will be rescinded with forfeiture of E.M.D and security deposit and I/We* shall be liable to make good the loss or damage resulting from such cancellation.

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

(*) – **Strike out which is not applicable**

Signature of the Contractor

Date: -

SCHEDULE- "B"**INFORMATION REGARDING CURRENT LITIGATION, DEBARRING, EXPELLING OF TENDERED OR ABANDONMENT OF WORK BY THE TENDERER**

1. a) Is the tender are currently involved in any litigation relating to the works. **: Yes/ No**
b) If yes, give details.
2. Has the bidder or any of its constituent partners been debarred/expelled by any agency in India during the last 5 years. **: Yes/ No**
3. a) Has the tendered or any of its constituent partners failed to perform on any contract work in India during the last 5 years. **: Yes/No**
b) If yes, give details.

Note: If any information in this schedule is found to be incorrect or concealed qualification application will be summarily be rejected.

Signature of the Contractor

CONTRACTOR

SUPERINTENDING ENGINEER

AFFIDAVIT FOR AUTHENTICITY OF TENDER

I, Sri/Smt. _____ Aged _____ years, Son / Daughter / Husband /Wife of Sri / Smt. _____ at present residing, At-_____,Po- _____, Ps- _____, Dist.- _____, Pin- _____ Do hereby solemnly affirm as follows.

i) That, I / We possess a valid Contractor's **License no.** _____ for execution of work contracts, **issued by** _____ belongs to _____ Class & is **valid up to** _____.

I am submitting tenders before _____ for execution of the following work in response to **Tender Call Notice No.** _____.

Work Name _____.

I am the authorized signatory on behalf of the Contractor for signing the tender for the work mentioned above.

ii) I am swearing this affidavit that all tender documents and accompanying papers those being submitted by me before _____ are all authentic and Bonafide documents in the eyes of the Law.

That the facts stated in the affidavit are true to the best of my knowledge and belief.

Signature of Contractor / Authorized
Signatory

Note: i) Mention the License issuing authority.
ii) Mention the date up to which the License is valid.
iii) Mention name of the work for which tender is being submitted.

ANNEXURE- E(2)

AFFIDAVIT

I, Sri..... Aged Years,
Son/ Daughter/ Wife of Sri..... at present residing
At P.O..... P.S.....
Dist..... Pin..... do here by declare that , I have not
registered under the VAT act in the state of Odisha as I have not started any business in the state
and I have no liability under the act.

In the event of this contract is awarded to me, I will register my self in the VAT Act in the State
of Odisha and I will produce the VAT clearance certificate in form VAT 612 before drawl of agreement.

That the facts stated in the affidavit are true to the best of my knowledge and belief.

Signature of Contractor /
Authorized Signatory

Note:- This certificate is required to be furnished by the outside contractor who has not started any
business in the state of Odisha.

PART-II

CHAPTER – I

CONTRACT FOR WORKS

ODISHA PUBLIC WORKS DEPARTMENT (FORM P-1)

Item Rate Tender and Contract for works

General Rules and Directions for the Guidance of Contractor.

1. All works proposed for execution by contract will be notified in a form of invitation to tender pasted on a board hung up in the office and signed by the Sub-divisional Officer / Executive Engineer.

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 to be deposited by the successful tenderer and the percentage if any, to be deducted from bills. Copies of the specification, 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 payments made on account of work, 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 receipt 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 Public Works Department and their issue rates shall be filled in and completed in the office of the Sub-divisional Officer/ Executive Engineer before the tender form is issued if a form is issued to an intending tenderer without having been so filled in a completed he shall request the office to have this done before he completes and delivers his tender.

5. Any person who submits a tender shall fill up the usual printed form stating at what rate he is willing to undertake each item of the work. Incomplete tender and tenders which propose any alternation in the work specified in the said form of invitation to tender, or which contain any other conditions of any sort, or omit to note the time within which the work can be furnished or which are not accompanied by a treasury challan for the required earnest money will be liable to rejection. No single tender shall include more than one work. But contractors who wish to tender for two or more work shall submit a separate tender for each. Tender shall bear the name of the work to which they refer written outside the envelope. Cash deposits for earnest money herein before mentioned shall be made in Govt. treasuries and the challan thereof should be enclosed with the tender.

6. The Engineer 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 a tender being rejected, the challan for the earnest money forwarded therewith shall there upon be returned to the tenderer with a pay order for the amount of the earnest money.

7. The Tender Inviting Authority 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 document mentioned in rules 1 and 4 for the purpose of identification and for his acceptance with tender. 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 may reject the tender.

CONTRACTOR

SUPERINTENDING ENGINEER

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 there upon sign forthwith copies of the specification and other documents mentioned in rules 1 to 4 shall deposit the required amount of the security money 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 competent to accept the same in case he rejects the tender the security money deposited shall be refunded to tenderer.

9. When a tender is selected for acceptance the tenderer shall deposit the required amount of the security money in cash in the treasury and shall forward the challan to the Executive Engineer Govt. securities may be endorsed to the Executive Engineer in lieu of a cash deposit of the required amount of the security money. No tender shall be finally accepted until the required amount of the security money has been deposited.

10. The amount of security money to be deposited by the tenderer whose tender is selected for acceptance shall be **2 (Two)** percent of the estimated value of the work and towards this amount, the earnest money already deposited by him shall be credited. At least half this security inclusive of the earnest money shall be deposited by the tenderer within such time as may be notified to him in writing by the office opening the tender, failing which tender shall be liable to rejection.

Any balance of the Security money outstanding after completion of the contract with the tenderer may be made up by deductions of 3/5 percent of the amount of each payment to be made to him under clause 6 of the conditions of contract for the work done under the contract.

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, 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 tender or if he is not so competent, shall send the form for signature of the acceptance to the officer competent to accept it.

- 12.** (i) A separate and specific bank account may be opened to keep the security deposits deducted from the running bills in any Nationalized Bank only in the name of the concerned Executive Engineer of the Division/ FA & CAO, but not in personal name.
(ii) The security amount so deposited should be withdrawn from the same account after completion of the defect liability period of the concerned work and after the work is found defect free in all respects.

TENDER FOR WORKS

I / We hereby tender for the execution for the Government of Odisha for the work specified in the underwritten memorandum at the rates specified therein a period of **08 (Eight) calendar months** from the date of written order to commence and in accordance in all respects with the specifications designs and other documents referred to in rule. I here of and subject to the annexed conditions of contract and with such materials as are provided for by and in all other respects in accordance with such condition so far as applicable.

MEMORANDUM

(a) If several sub-works are included they should be detailed in a separate list	a.	Name of work	:	Construction of Toilet Room at Division Office Building under UI Left canal Division No I , Kusumkhunti.
	b.	Amount put to tender	:	Rs. 12,16,048.41
	c.	Agreement Amount	:	
	d.	Earnest Money Deposit	:	Rs. 12,200.00
	e.	Initial Security Deposit (including earnest money to be deposited before the commencement of the work)	:	
(e) This deposit will be 2 % of the Agreement				
(f) This percentage deduction from bills be credited to the contractor's security	f.	Percentage to be deducted from bill (As Security Deposit)	:	
	g.	Time required for the work from date of written order to commence	:	
	h.	Date of written order to commence work	:	
	i.	Actual date of commencement	:	
	j.	Stipulated date of completion	:	
	k.	Number of items of works tendered for	:	
	l.	Income Tax	:	
	m.	GST	:	
	n.	Royalty of construction materials	:	
	o.	Building and other construction Workers Welfare Cess	:	

CONTRACTOR

SUPERINTENDING ENGINEER

Signature of
contractor before
submission of
tender.

Should this tender be accepted, I/We hereby agree to abide by and fulfill all the terms and provisions of the said conditions of contract annexed here to so far as applicable or in default thereof to forfeit and pay to the Governor of Odisha or his successors in office the sum of money mentioned in said conditions.

Dated the day of20

Signature of the Witness to
tender Signature

Signature of Contractor

Address

Address

Signature of
officer by whom
accepted.

The above tender is hereby accepted by me on behalf of the Government of Odisha.

Dated..... day of20

**Superintending Engineer
U.I. Left Canal Division No-I
Kusumkhunti,**

Agreement No P1/..... Certified that this agreement containspages only.

**Superintending Engineer
U.I. Left Canal Division No.- I
Kusumkhunti,**

CONDITIONS OF CONTRACT

Compensation for delay	Clause-1 : All compensation or other sums of money payable by the contractor to Government under the terms of his contract may be deducted from or paid by, the sale of a sufficient part of his security deposit or from the interest arising there from, or from any sums which may be due or may become due to the contractor by Government on any account whatsoever and in the event of his security deposit being reduced by reason of any such deduction or sale as aforesaid, the contractor shall within ten days thereafter make good in shape of NSC/ KVP/ Deposit receipt of schedule Bank Pledged in favour of the Executive Engineer endorsed as aforesaid any sum or sums which may have been deducted from, or raised by, sale of the security deposit or any part thereof.
The work should not be considered finished until such date as the Executive Engineer shall certify as the date as on which the work is finished after necessary rectification of defects as pointed out by the Executive Engineer or his authorized agents are fully complied with by the contractor to the Executive Engineer's satisfaction :	Clause-2(a): the time allowed for carrying out the work as entered in the tender shall be strictly observed by the contractor and shall be reckoned from the date on which the written order to commence work is given to the contractor. The work shall throughout the stipulated period of the contract, be carried on with all due diligence (time being deemed to be essence of the contract on the part of the contractor) and the contractor shall pay, as compensation, an amount equal to 1/2 percent of the amount of the estimated cost, if the whole work as shown by the tender for every day that the work remains un-commenced, or un-finished after the proper dates (The work should not be considered finished until such date as the Executive Engineer shall certify as the date on which the work is finished after necessary rectification of defects as pointed out by the Executive Engineer or his authorized agents, are fully complied with by the contractor to the Executive Engineer's satisfaction). And further to ensure good progress during the execution of the work, the contractor shall be bound, in all cases in which the time allowed for any work exceeds one month, to complete one-fourth of the whole of the work before one fourth of the whole time allowed under the contract has elapsed, one half of the work, before the half of such time has elapsed, and three fourth of work before three fourths of such time has elapsed. In the event of the contractor failing to comply with the condition he shall be liable to pay as compensation an amount equal to one-third percent on the said estimated cost of the whole work for every day that the due quantity of work remains incomplete. Provided always that the entire amount of compensation to be paid under the provision of this clause shall not exceed 10 percent of the estimated cost of the work as shown in the tender. (b) If there are possibilities of exceeding this compensation amount as mentioned in clause (a) 10% of the estimated cost, or in any case in which under any clause or clauses of this contract, the contractor shall have rendered himself liable to pay compensation amounting to the whole of his security deposit in the hands of Government (whether paid in the sum or deducted by installments) the Executive Engineer on behalf of the Governor of Odisha, shall have power to adopt any of the following courses, as he may deem best suited to the interest of the Government. i) To rescind the contract (of which recession notice in writing to the contractor under the hand of the Executive Engineer shall be conclusive evidence) 20% of the value of the left over work will be realized from the contractor as penalty . ii) To employ labour paid by Deptt. of Water Resources and to supply materials to carry out the work, or any part of the work, debiting the contractor with the cost of the labour and the price of the materials (of the amount of which the cost and price certificate of the Executive Engineer shall be final and conclusive against the contractor) and crediting him with the value of the work done, in all respect in the same manner and at the same rates as

Actions when whole security deposit is forfeited:	if it had been carried out by the contractor under the terms of his contract; the certificate of the Executive Engineer as to the value of the work done shall be final and conclusive against the contractor. iii) To measure up the work of the contractor and to take such part of the work of the contract, as shall be unexecuted out of his hands and to give it to another contractor to complete, in which case any expenses which may be incurred in excess of the sum which would have been paid to the original contractor if the whole work had been executed by him (of the amount of which excess the certificate in writing of the Executive Engineer shall be final and conclusive) shall be borne and paid by the original contractor and may be deducted from any money due to him by Government under the contract or otherwise or from his security deposit or the proceeds of sale thereof or a sufficient part thereof. In the event of any of the above courses being adopted by the Executive Engineer the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials, or entered into any engagements, or made any advance on account of with a view to the execution of the work or the performance of the contract. And in case the contract shall be rescinded under the provision aforesaid, the contractor shall not be entitled to recover or be paid any sum for any work there to for actually performed under this contract, unless and until the Executive Engineer shall have certified in writing the performance of such work and the value payable in-respect thereof and he shall only be entitled to be paid the value so Certified. iv) Security deposit of the contractor shall be refunded only one year after the date of completion of the work provided the final bill has been paid and defects, if any rectified. In case, however where refund of security is delayed for nonpayment of final bill, two percent of the security deposit recovered as earnest money and initial security shall be refunded and the balance of the security deposit shall be refunded after payment of the final bill. However, the security deposit less any amount due, shall be returned to the contractor subject to the Engineer-in- Charge certifying that no liability attaches to the contractor.
Contractor remains liable to pay compensation if action not taken under clause – 5 Power to take possession of a require removal of or sell contractor's plants	Clause-3 : In any case in which any of the powers, conferred upon the Executive Engineer by clause 2 hereof, shall have become exercisable if the same shall not be exercised. The non-exercise thereof shall not constitute a waiver of any of the conditions in the event any further here of and such powers shall notwithstanding to be exercisable. In the event of any future case of default by the contractor of which by any clause or clauses hereof he is declared liable to pay compensation amounting to the whole of his security deposit, and the liability of the contractor for past and future compensation shall remain unaffected. In the event of the Executive Engineer putting in force the powers vested in him under the preceding clauses, he may if he so desires, take possession of all or any tools, plants, materials and stores, in or upon the works, or the site thereof or belonging to the Contractor, or procured by him and intended to be used for the execution of the work or any part thereof, paying or allowing for the same in the account at the contract rates, or in case of these not being applicable, at current market rates to be certified by the Executive Engineer whose certificate thereof shall be final, otherwise the Executive Engineer may notice in writing to the contractor or his clerk of the works, foreman or other authorized agent require him to remove such tools, plants, materials, or stores from the premises (within a time to be specified in such notice) and in the event of the contractor failing to comply with any such requisition, the Executive Engineer may remove them at the contractor's expense or sell them by auction or private sale on account of the contractor and at his risk in all respects, and the certificate of the Executive Engineer as to the expense of any such

	removal and the amount of the proceeds and expense of any such sale shall be final and conclusive against the contractor.
Extension of time	Clause - 4 : If the contractor shall desire an extension of the time for completion of the work, on the ground of his having been unavoidably hindered in its execution or any other ground, he shall apply in writing to the Executive Engineer within 30 days of the date of the hindrance on account of which he desires such extension as aforesaid and, the Executive Engineer shall, if in his opinion (which shall be final) reasonable grounds be shown therefore, authorize such extension of time, if any, as may in his opinion be necessary or proper. The Executive Engineer shall at the same time inform the contractor whether he claims compensation for delay. In case where the sanction of higher authority to grant extension of time is necessary, the Executive Engineer will send his recommendation to higher authority. If the order of the competent authority is not received within 60 days from the date of receipt of recommendation of the Executive Engineer, the Executive Engineer shall grant extension of time under intimation to the concerned authorities so that the contract shall remain in force, but while communicating this extension of time he must inform the contractor that extension is granted without prejudice to Government's right to levy compensation under relevant clause of the Agreement.
Final Certificate	Clause-5 : On completion of the work, the contractor shall be furnished with a certificate by the Executive Engineer (hereinafter called the Engineer-in-charge) of such completion, but no such certificate be given nor shall the work be considered to be completed until the contractor shall have removed from the area of the premises (to be distinctly marked by the Executive Engineer in the site plan) on which the work shall be executed all scaffolding surplus materials and rubbish, and cleared off the dirt from all wood-work, doors, windows, walls, floors or other parts of any building in upon or about which the work is to be executed, or of which he may have had possession for the purpose of the execution thereof, nor until the work shall have been measured by the Officer of the Department of Water Resources in accordance with the rules of the department whose measurements shall be binding and conclusive against the contractor, if the contractor shall fail to comply with the requirements of this clause as to removal of scaffolding surplus materials and rubbish and cleaning off dirt on or before the date fixed for the completion of the work, the Engineer-in-charge may at the expense of the contractor remove such scaffoldings surplus materials and rubbish and dispose of the same as he thinks fit and clean off such dirt as aforesaid and the contractor shall forthwith pay the amount of all expenses incurred and shall have no claim in respect of any such scaffolding or surplus materials; as aforesaid except for any sum actually realized by the sale thereof. Sub-Clause - 5 : If in the opinion of Engineer-in-Charge, which shall be final and binding on the contractor, occupation or utilization of a portion of the work completed in no way interferes with progress of the work the same may be occupied or utilized by on behalf of the Govt. under the written order of the Engineer-in-Charge and to get the defects, if any rectified by the contractor at his (Contractor) own cost within six months from the date of completion of the whole work provided that the contractor will not be allowed any concession either in the shape of extension of stipulated period or any other monetary compensation on account of such occupation or use.
Payment on intermediate certificate be regarded as	Clause-6 : A bill shall be submitted by the contractor each month on or before the date fixed by the Engineer-in-charge for all works executed in the previous month and the Engineer-in-Charge or his subordinate shall take the requisite measurement for the purpose having the same verified and the claim as far as admissible, adjusted, if possible, before the expiry of

advances and bill to be submitted monthly.	ten days from the presentation of the bill. If the contractor does not submit the bill within the time fixed as aforesaid, the Engineer-in-Charge or his subordinate shall measure up the said work in the presence of the contractor whose counter signature to the measurement list will be sufficient warrant, and the Engineer-in-Charge or his subordinate shall prepare a bill from such list which shall be binding on the contractor in all respects. Provided that, if any balance of the 7% security, outstanding from each such payment shall be deducted so as to, not exceeding 5% as may be necessary to make up the balance of the security. All such intermediate payments to the contractor shall be regarded as payments by way of advance against the final payment only and not as payments for work actually done and completed and shall not preclude the requiring of bad, unsound and imperfect or unskillful work to be removed and taken away and reconstructed or erected, or any part thereof in any respect, or the accrual of any claim nor shall it conclude, determine, or effect in any way the powers of the Engineer-in-Charge under these conditions or any of them as to the final settlement or adjustment of the accounts or otherwise, or in any other way vary or affect the contract. Clause-7 : The final bill shall be prepared by the officers of the Department of Water Resources in accordance with the rules of the Department in the presence of the contractor within one month of the date fixed for completion of the work.
Stores supplied by Government.	Clause-8 : If the specification or estimate of the work provides for the use of any special description of materials to be supplied from the Engineer-in-Charge's store, or if it is required that the contractor shall use certain stores to be provided by the Engineer-in-Charge under the conditions of this contract (such materials and stores and the prices to be charged therefore as hereinafter mentioned being so far as practicable for the convenience of the contractor, but not so as in any way to control the meaning or effect of this contract or are specified in the schedule or memorandum hereto annexed) the contractor shall be supplied with such materials and stores noted in the annexed schedule as are required from time to time to be used by him for the purposes of the contract only, and the value of the full quantity of materials and stores so supplied at the rates specified in the said schedule may be set off or deducted from any sums then, due or thereafter to become due to the contractor under the contract or otherwise, or against or from the security deposit, or the proceeds of sale thereof if the same is held in Government securities, the same or a sufficient portion thereof being in this case sold for the purpose. All materials supplied to the contractor shall remain the absolute property of Government and shall not on any account be removed from the site of the work and shall at all times be open to inspection by the Engineer-in-Charge. Any such materials unused and in perfectly good condition at the time of the completion or determination of the contract shall be returned to the Engineer-in-Charge's store, at the prevailing market rate or at the issue rate whichever is less if by a notice in writing under his hand he shall so require, but the contractor shall not be entitled to return any such materials unless with such consent, and shall have no claim for compensation on account of any such materials so supplied to him as aforesaid being unused by him, or for any wastage in or damage to any such materials. Clause - 8(a) : "If a contractor removes any materials or stock so supplied to him from the site of the work in contravention of the provision of this clause with a view to dispose of the same dishonestly, he shall, in addition to any other liability, civil or criminal arising out of this contract be liable to pay a penalty equivalent to five times the price of the said materials or stock, according to the stipulated rate. The penalty so imposed shall be recoverable from any sum that be then or at any time thereafter may become due to the contractor, or from his security deposit, or the proceeds of sale thereof". Clause-8(b) : Owing to difficulty in obtaining certain materials in the open market the Government have undertaken to supply materials specified in the schedule hereto annexed.

	There may be delay in obtaining materials by the Department and the contractor is therefore required to keep himself in touch with the day-to-day position regarding the supply of materials from the Engineer-in-Charge and to so adjust the progress of the work that their labour may not remain idle nor may there be any other claim due to or arising from delay in obtaining the materials. It should be clearly understood that no monetary claim whatsoever shall be entertained by the Government on account of delay in supplying materials. However, extension of time for completion of work can be granted on timely application by the contractor vide also Clause-4.
Works to be executed in accordance with specification, drawing and orders etc. Do not invalidate Contract. Extension of time in consequence of alterations. Rates of work not in estimate or schedule	Clause - 9 : The contractor shall execute the whole and every part of the work in the most substantial and workmanlike manner, and both as regards materials and otherwise in every respect in strict accordance with the specifications. The contractor shall also confirm exactly, fully and faithfully to the designs, drawings and instructions in writing relating to the work signed by the Engineer-in-Charge and lodged in his office, and to which the contractor shall be entitled to have access at such office, for the purpose of inspection during office hour and the contractor shall, if he so requires, be entitled at his own expenses to make or cause to be made copies of the specification, and of all such designs, drawings and instructions as aforesaid. Clause-10 : The Engineer-in-Charge shall have power to make any alterations in or additions to the original specifications, drawings, designs and instructions that may appear to him necessary and advisable during the progress of work and the contractor shall be bound to carry out the work in accordance with any instructions which may be given to him in writing signed by the Engineer-in-Charge and such alteration shall not invalidate the contract, and any additional work which the contractor may be directed to do in the manner above specified as part of the work shall be carried out by the contractor on the same conditions in all respects on which he agreed to do the main work, and at the same rates as are specified in the tender for the main work. The time for the completion of the work shall be extended in the proportion that the additional work differs to the original contract work and the certificate of the Engineer-in-Charge shall be conclusive as to, such proportion. And if the additional work includes any class of work, for which no rate is specified in this contract, then such class of work shall be carried out at the rates entered in the sanctioned schedule of rates of the locality during the period when the work is being carried on and if such last mentioned class of work is not entered on the schedule of rates of the district, then the contractor shall within seven days of the date of his receipt of the order to carry out the work inform the Engineer-in-Charge of the rate which it is his intension to charge for such class of work, and if the Engineer-in-Charge does not agree to this rate he shall by notice in writing be at liberty to cancel his order to carry out such class of work and arrange to carry it out in such manner as he may consider advisable. No deviations from the specification stipulated in the contract or additional items of work shall ordinarily be carried out by the contractor, nor shall any altered, additional or substituted work be carried out by him, unless the rates of the substituted, altered or additional items have been approved and fixed in writing by the Engineer-in-Charge. The contractor shall be bound to submit his claim for any additional work done during any month on or before the 15th day of the following month accompanied by a copy of the order in writing of the Engineer-in-Charge for the additional work and that the contractor shall not be entitled to any payment in respect of such additional work if he fails to submit his claim within the aforesaid period. Provided always that if the contractor shall commence work or incur any expenditure in regard thereof before the rates shall have been determined as lastly herein before mentioned, in such case he shall only be entitled to be paid in respect of the work carried out or expenditure incurred by him prior to the date of the determination of the rates as aforesaid

of rates of the district	according to such rates as shall be fixed by the Engineer-in-Charge. In the event of a dispute, the decision of the Executive Engineer of the Circle will be final
No compensation for alteration in or restriction of work to be carried out.	Clause-11 : If at any time after the commencement of the work the Governor of Odisha shall for any reason whatsoever not required the whole thereof as specified in the tender to be carried out, the Engineer-in-Charge shall give notice in writing of the fact to the contractor who shall have no claim to any payment or compensation whatsoever on account of any profit or advantage, which he might have derived from the execution of the work in full which he did not derive in consequence of the full amount of the work not having been carried out neither shall he have any claim for compensation by reason of any alterations having been made in the original specification drawings, designs and instruction which shall involve any curtailment of the work as originally contemplated.
Action and compensation payable in case of bad work.	Clause -12 : If it shall appear to the Engineer-in-charge or his sub-ordinate-in-charge of the work, that any work, that any work has been executed with unsound, imperfect or unskillful workmanship or with materials of any inferior description, or that any materials or articles provided by him for the execution of the work are unsound or of a quality inferior to that contracted for or otherwise not in accordance with the contract, the contractor, shall on demand in writing from the Engineer-in-Charge specifying the work, materials or articles complained of notwithstanding that the same may have been inadvertently passed certified and paid for, forthwith rectify or remove and reconstruct the work so specified in whole or in part, as the case may require or as the case may be, remove the materials or articles so specified and provide other proper and suitable materials or articles at his own proper charge and cost, and in the event of his failing to do so within a period to be specified by the Engineer-in-charge in his demand aforesaid, then the contractor shall be liable to pay compensation at the rate of one percent on the amount of the estimate for every day not exceeding ten days, while his failure to do so shall continue and in the case of any such failure the Engineer - in -charge may rectify or remove, and re-execute the work or remove and replace with others, the materials or articles complained of as the case may be at the risk and expense in all respects of the contractor.
Work to be open for inspection.	Clause - 13: All work under or in course of execution or executed in pursuance of the contract shall at all times be opened to the inspection and supervision of the Engineer - in-charge and his subordinates and the contractor shall at all times during the usual working hours, and at all other times at which reasonable notice of the intention of the Engineer -in-charge or his subordinate to visit the works shall have been given to the contractor either himself be present to receive orders and instruction, or have a responsible agent duly accredited in writing, present for that purposes. Orders given to the contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.
Contractor or responsible Agents to be present.	
Notice to be given before work is covered up.	Clause -14: The contractor shall give not less than five days notice in writing to Engineer-in-charge or his subordinate -in charge of the work before covering up or otherwise placing beyond the reach of measurement of any work in order that the same may be measured and correct dimensions thereof be taken before the same is so covered up or placed beyond the reach of measurement and shall not cover up or place beyond the reach of measurement, any work without the consent in writing of the Engineer in charge or his subordinate - in charge of the work and if any work shall be covered up or placed beyond the reach of measurement without such notice having been given or consent obtained,, the same shall be uncovered at the contractor's expense, or in default thereof no payment or allowance shall be made for such work of the materials with which same was executed.
	Clause -15: If the contractor or his work people, or servants shall break, deface injure or destroy any part of a building in which they may be working or any building, road, fence,

Contractor is liable for damages done and for imperfection for 3 months after certificate.	enclosure, or grass land or cultivated ground continuous to the premises on which the work of any part of it is being executed or if any damages shall happen to the work while in progress, from any cause whatever or any imperfection became apparent in it within three months from the date of final certificate of its completion shall have been given by the Engineer-in-Charge, as aforesaid the contractor shall make the same to be made good by other workmen and deduct the expenses (of which the certificate of the Engineer-in-Charge shall be final) from any sums that may be then, or at any time thereafter may become due to the contractor, or from his security deposit or the proceeds of sale thereof, or of a sufficient portion thereof and the contractor shall be liable to pay any part of the expenses not so recovered by the Engineer-in-charge.
Contractor to supply plant, ladders, scaffolding etc.	Clause -16 : The contractor shall supply at his own cost all materials (except such special materials, if any as may in accordance with the contract be supplied from the Engineer -in - charges stores), Plant, tools, appliances, Implements, ladders, cordage, tackle scaffolding and temporary works requisite or proper for) the proper execution of the work whether original, altered or substituted, and whether included in the specification or other documents forming part of the contract or referred to in these conditions or not to which may be necessary for the purpose of satisfying or complying with the requirement of the Engineer-in Charge as to any matter as to which under this conditions he is entitled to be satisfied which he is entitled to require together with carriage therefore to and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials necessary for the purpose of setting out works, and counting, weighing and assisting in the measurement of examination at any time and from time to time of the work or the materials. Failing him so doing the same may be provided by the Engineer-in-Charge at the expense of the contractor under the contract or from his security deposit or the proceeds of sale thereof, or of a sufficient portion thereof. The contractor shall also provide all necessary fencing and lights required to protect the public from accident, and shall be bound to bear the expenses of defense of every suit, action or other proceedings at law that may be brought any person for injury sustained owing to neglect of the above precautions, and to pay damages and cost which may be awarded in any such suit, action or proceedings to any such person or which may with the consent or the contractor be paid to compromise any claim by any such person.
And is liable for damages arising from provision of lights fencing etc.	Clause-17: No female labourer shall be employed within the limits of a cantonment. The contractor shall not employ for the purpose of this contract any person who is below the age of twelve years, and shall pay to each labourer for the work done by such labourer, wages not less than the wages paid for similar work in the neighborhood. The Executive Engineer shall have the right to enquire into and decide any complaint alleging that the wages paid by the contractor to any labourer for the work done, by such labourer is less than the wages paid for similar work in the neighborhood. Explanation - Fair wages means wages whether for time or piecework prescribed by the State DOWR provided that where higher rates have been prescribed under the minimum wages Act. 1948 wages at such higher rates would constitute Fair Wages. The Executive Engineer shall have the right to enquire into and decide any complaint alleging that the wages paid by the contractor to any labour for the work done by such labour is less than the wages paid for similar work in the neighborhood. The officer-in-charge of the work shall have the right to decide whether any labourer employed by the contractor is below the age of twelve years and to refuse to allow any labourer whom he decides to be below the age of twelve years to be employed by the contractor.

Work not to be sublet. Contract may be rescinded and security deposit forfeited for subletting, bribing or if contractor becomes insolvent. Sum payable by way of compensation to be considered as reasonable compensation without reference to actual loss. Changes in constitution of firm. Lump sums in estimates.	Clause-17(a) – The contractor shall if so required by the Engineer-in-Charge employ one or more Engineering Graduates or Diploma holders as apprentices at his own cost of the work as shown in the tender exceed Rs.2,50 Cr. The Chief Engineer will select the apprentices. The period of employment will commence within one month after the date of work order and would last until the date when 90% of the work is completed. The stipend to be paid to the apprentices should not be less than Rs. 200/- per month in the case of graduate Engineers and less than Rs.150/- per month in case of Diploma holders. The number of apprentices to be employed shall be fixed by the Chief Engineer in a manner so that the expenditure does not exceed 1 % of the tendered cost of the work. Clause-18: The contractor shall not be assigned or sublet without the written approval of the Executive Engineer. And if the contractor shall assign or sublet his contract or attempt to do so or become insolvent or commence any insolvency, proceedings or make any composition with his creditor or attempt to do so or if any bribe, gratuity, gift, loan, perquisite reward, or advance, pecuniary or otherwise, shall either directly or indirectly be given, promised, or offered by the contractor, or any of his servants or agents to any public officer or persons in the employ of Government in any way relating to his office employment, or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Executive Engineer may there upon by notice in writing rescind the contract and the security deposit of the contractor shall there upon stand forfeited and be absolutely at the disposal of Government and the same consequences shall ensure if he contract had been rescinded under the clause 2 thereof, and in addition the contractor, shall not be entitled to recover or be paid for any work thereto for actually performed under the contract. Clause-19: All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to the use of Government without reference to the actual loss or damage sustained and whether or not any damage shall have been sustained. Clause-20: In the case of a tender by partners, any change in the constitution of the firm shall be forth with notified by the contractor to the Engineer-in-charge for his information. In case of failure to notify the change in the constitution within fifteen days the Engineer-in-charge may by notice in writing rescind the contracts and the security deposit of the contractor shall thereupon stand forfeited and be absolutely at the disposal of Government and the same consequences shall ensure as if the contract had been rescinded under clause-2 hereof, and in addition the contractor shall not be entitled to recover or be paid for any works therefore actually performed under the contract. Clause-21: All works to be executed under the contract shall be executed under the direction and subject to the approval in all respects of the Executive Engineer of the Circle for the time being who shall be entitled to direct at what point or points and in what manner they are to be commenced and from time to time carried on. Clause-22: Deleted. Clause-23: When the estimate on which a tender is made includes lump sums in respect of parts of the work the contractor shall be entitled to payment In respect of the Items of work involved or the part of the work in question at the same rates as are payable under this contract for such items, or if the part of the work in question is not, in the opinion of the Engineer-in-charge capable of measurement, the Engineer-in-charge may by his discretion pay the lump sum amounts entered in the estimate, and the certificate in writing of the Engineer-in-charge
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Action where no specification. Definition of works.	shall be final and conclusive against the contractor with regard to any sum or sums payable to him under the provisions of this clause. Clause-24: In the case of any class of work for which there is no such specification as is mentioned in the rule I, such work shall be carried out in accordance with Circle specification and in the event of there being no circle specification, then in such case the work shall be carried out in all respect in accordance with the instructions and requirements of the Engineer-in-charge. Clause-25 : The expression “work” or “work” where used in these conditions shall, unless there be something either in the subject or context repugnant to such construction, be construed, and taken to mean the works by or by virtue of the contract contracted to be executed, whether temporary or permanent, and whether original, altered, substituted or additional. Clause-26: Government shall be entitled to recover in full from the contractor any amount that the Government may be liable to pay under Workman’s compensation Act-VII of 1923 to any workmen employed in course of execution of any part of the work covered by these contracts. Clause-27 : That the purpose of jurisdiction in the event dispute if any, the contract should be deemed to have been entered into within the state of Odisha and it is agreed that neither party to the contract or of agreement will be competent to bring a suit in regard to the matters covered by this contract at any place outside the state of Odisha. Clause-28: The department will have the right to inspect the scaffolding and centering made for the work and can reject partly or fully such structure if found defective in their opinion. Clause-29 : Sanitary arrangements will be made by the contractor at this own cost for his labour camp. Clause-30 : The contractor shall bear all taxes including sales tax, Income tax, royalty, fair-weather charges and tollage, where necessary.
	Clause-31:-Price Adjustment [WORKS DEPARTMENT OM NO. 15847/W DT. 19.11.2019 r/w WORKS DEPARTMENT OM NO. 1739/W DT. 03.02.2023] ANNEXURE-A 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):<u>Adjustment of Other Materials Component</u> Price adjustment for increase or decrease in the 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. 31(a)(ii):<u>Adjustment for Cement Component</u> 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 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):<u>Adjustment for Steel Component</u>
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	(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 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 (Mild Steel long products) has been chosen to represent steel group. 31(a)(iv): <u>Adjustment of Bitumen Component</u> (iv) 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 rates for bitumen. B_0= The official retail price of bulk bitumen 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): <u>Adjustment towards differential cost of Pipes.</u> 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.
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	Pi0= 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. 31(b): <u>Adjustment of Labour Component</u> Price adjustment for increase or decrease in the cost due to labour shall be paid in accordance with the following formula: VL= $0.85 \times P1/100 \times R \times (L1-L0)/L0$ VL= Increase or decrease in the cost of work during the month under consideration due to changes in rates for local labour. L0= 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. L1= 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. P1= Percentage of labour component of the work 31(c):<u>Adjustment of POL (Fuel and Lubricant) Component</u> (v) Price adjustment for increase or decrease in cost POL(fuel and lubricant) shall be paid in accordance with the following formula Vf= $0.85 \times Pf/100 \times R \times (F1-F0)/F0$ Vf= Increase or decrease in the cost of work during the month under consideration due to changes in rates for fuel and lubricants. F0= 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. F1= The official retail price of High Speed Diesel (HSD) at the existing consumer pumps of IOC / BPCL/ HPCL at nearest center for the 15th day of the month under consideration. Pf= Percentage of fuel and lubricant 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 31(d):<u>Adjustment for Plant and Machinery Spares Component</u> (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 Vp= $0.85 \times Pp/100 \times R \times (P1-P0)/P0$
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Vp= Increase or decrease in the cost of work during the month under consideration due to changes in the rates for plant and machinery spares.

P0= 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.

P1= 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.

Pp= 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 Portland cement
2	Bars & rods	Rebars	Mild steel long products
3.	Heavy Machinery & parts	Construction Machinery	Manufacture of Machinery for mining, quarrying & construction.

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 thereto which he may be in a position to supply.

Percentage Table

Sl. No	Category of work		% Component (cost wise)		
			Labour (P1)	POL (Pf)	Steel (Ps +Cement (Pc) +Bitumen (Pb)+ Pipe (Ppi)+Plant & Machinery Spare & Component (Pp) + other Materials*
1	R&B works (% of component)	Road Works	5	5	90
		Bridge Works	5	5	90
		Building Works	5	5	90
2	Irrigation Works (% of component)	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 breakup 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)

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.			90%
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 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 Employees 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.			0%
				Total		100%
* Values to be filled up at the time of drawl of contract **Values to be filled up in the bid document.						

FAIR WAGE CLAUSE

Clause-33 (a) The contractor shall pay the wages not less than fair wages to labourers engaged by him on the work.

Explanation : “ Fair Wage” means wages, whether for time or piece work prescribed by the state Public Works Department, provided that where higher rates have been prescribed under the Minimum Wages Act.1948, wages at such higher rates would constitute “Fair Wages”.(WD No.22059 dt:16.8.77)

- (a) The contractor shall, notwithstanding the provisions of any contract to contrary, cause to be paid a fair wage to labourer indirectly engaged on the work including any labour engaged by his subcontractors in connection with the said work, as if the labourers had been immediately employed by him.
- (b) In respect of all labour directly or indirectly employed in the works for the performance of the contractors part of this agreement, the contractor shall comply with or cause to be complied with all regulations made by the Government in regard to payment of wages, wage period deductions from wages, recovery of wages not paid and unauthorized deductions made, maintenance of wage register, wage cards, publication of scale of wages and other terms of employment, inspection and submission of periodical returns and all other matters of a like nature.
- (c) The Executive Engineer or Sub-Divisional Officer concerned shall have the right to deduct, from the money due to the contractor, any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non-fulfilment of wages or of deductions made from their wages, which are not justified by their terms of the contract or non-observance of the regulations. Money so deducted should be transferred to the workers concerned.
- (d) Vis-à-vis the Government of Odisha, the contractor shall be primarily liable for all payments to be made under and for the observance of the regulations aforesaid without prejudice to his right to

claim indemnity from his sub-contractors.

- (e) The regulations aforesaid shall be deemed to be part of this contract and any breach thereof shall be breach of this contract.
 - (f) Under the provision of the Minimum Wages Act 1948 and the minimum wages (Central Rules, 1950) the contractor is bound to allow or cause to be allowed to the labourers directly or indirectly employed in the work one day rest for six days continuous work and pay wages at the same rate as for duty. In the event of default, the Executive Engineer of Sub-Divisional Officer concerned shall have the right to deduct the sum not paid on account of wages for weekly holiday to any labourers and pay the same to the persons entitled thereto from any money due from the contractor.
 - (g) The contractor shall at his own expense provide or arrange for the provision of footwear for any labour doing cement mixing work and black topping work of roads (the contractor has under taken to execute under this contract) to the satisfaction of the Engineer-in-Charge, and on his failure to do so, the Government shall be entitled to provide the same and recover the cost from the contractor.
 - (h) The contractor shall submit by the 4th and 19th of every month, to the Engineer-in-Charge a true statement showing in respect of the second half of the preceding month and the first half of the current month respectively:
 - i.) The number of labourers employed by him on the work.
 - ii.) Their working hours.
 - iii.) The wages paid to them
 - iv.) The accident if any occurred during the said fortnight showing the circumstances under which they happened and the content of damage and injury caused by them and;
 - v.) The number of female workers who have been maternity benefit according to clause (K) and the amount paid to them, failing which the contractor shall be liable to pay the Government a sum not exceeding Rs.50/- for each default of materially incorrect statement. The decision of the Executive Engineer shall be final in deducting from any bill due to the contractor, amount levied as fine.
 - (i) In respect of all labour directly or indirectly employed in the works for the performance of the contractors part of this agreement, the contractor shall comply with or cause to be complied with all regulations made by the Government from time to time for the protection of health and sanitary arrangement for the workers employed by the Odisha Public Works Department and this will apply to work place having 50 or more workers.
 - (j) Maternity benefit rules for female workers employed by the contractor, leave and pay during leave shall be regulated as follows:
 - a) **Leave:** In respect of Delivery: Maternity leave not exceeding 8 weeks (4 weeks up to and including the day of delivery of 4th weeks following that day,.
 - in case of miscarriage: Up to 3 weeks from the date of miscarriage.
 - ii.) **Pay:** In case of Delivery: Leave pay during maternity leave will be at the rate of the woman's average daily earnings calculated on the total wages earned on the days when full time work was done during the period of three months immediately proceeding the date of which she gives notice that she expects to be confined or at the rate of Rs.52.50 a day whichever is greater.

In case of miscarriage: Leave pay at the rate of average daily earning calculated on the total wages earned on the days when full time work was done during a period of three months immediately preceding the date of miscarriage.
- Condition of the grant of maternity leave:** No maternity leave benefit shall be admissible to a woman unless she has been employed for a total not less than 6 months immediately proceeding the date on which she proceeding on leave.

MODEL RULES
FOR HEALTH & SANITARY ARRANGEMENTS FOR WORKERS EMPLOYED
BY ODISHA P.W.D.CONTRACTORS

1. APPLICATION: These rules shall apply to all construction work in-charge of Odisha Public Works Department, which is expected to continue for a year or more.
2. DEFINITIONS:
 - i. “Work Place” means a place at which an average of fifty or more workers is employed in connection with construction work.
 - ii. “Large Work Place” means a place at which an average of 500 or more workers is employed in connection with a work.
3. FIRST AID:
 - i. At every work place, there shall be maintained in a readily accessible place for first-aid appliances including an adequate supply of sterilizer dressings and sterilized cotton wool. The appliances shall be kept in good order and in large work places, which shall be readily available during working hours.
 - ii. At Large Work Places, where hospital facilities are not available within easy distance of works, first aid posts shall be established and run by a trained Compounder.
 - iii. Where Large Work Places are remote from regular hospitals an indoor ward shall be provided with one bed for every 250 employees.
 - iv. Where Large Work Places are situated in cities, towns or in their suburbs and no beds are considered necessary owing to the proximity of the city, town hospitals, an ambulance shall be provided to facilitate removal of urgent cases to these hospitals. At the work place, some conveyance facilities, such as a car, shall be kept readily available to take injured person or persons suddenly taken ill to the nearest hospital.
4. DRINKING WATER:
 - i. In every work places there shall be provide and maintained at suitable places, easily accessible to labour, a sufficient supply of water fit for drinking.
 - ii. Where drinking water is obtained from an intermittent public water supply, each work place shall be provided with storage where such drinking water shall be stored.
 - iii. Every water supply of storage shall be at distance of not less than 50 feet from any latrine, drain or other sources of pollution. Where water has to be drawn from an existing well, which is within such proximity of latrine, drain or any other source of pollution, the well shall be properly chlorinated before water is drawn from it for drinking. All such wells shall be entirely closed in and be provided with a trap door, which shall be dust and waterproof.
 - iv. A reliable pump shall be fitted to each covered well and trap door shall be kept locked and opened only for cleaning or inspection which shall be done at least once a month.
 - v. The temperature of the drinking water supplied to worker shall not exceed 90° F.
5. WASHING AND BATHING PLACE:
 - i. Adequate washing and bathing places shall be provided separately for men and women.
 - ii. Such places shall be kept clean and well drained condition.
6. SCALE OF ACCOMODATION IN LATRINES NAD URINALS:

There shall be provided within the premises of every work place, latrines and urinals in an accessible places and accommodation, separately for each of them for men and women not less than the following:

i.	Where the number of person employed does not exceed 50	No.of seats 2.
ii.	Where the number of person employed does exceed 50 but not exceed 50	No.of seats 3.
iii.	For every additional 100 employees (in particular cases, the Executive Engineer shall have the power to vary the scale where necessary)	No.of seats 3 per 100

7. LATRINE AND URINAL FOR WOMEN:

If women are employed, separate latrines and urinals separate from that for men shall also be exhibited at the entrance of latrines for each sex. There shall be adequate supply of water close to the urinals and latrines.

8. CLEANLINESS OF LATRINES AND URINALS:

Except in work places provide with water flushed latrines connected with a water borne sewerage system, all latrines shall be provided with receptacles on dry-earthen system, which shall be cleaned at least four times daily and at least twice during working hours and kept in a strictly sanitary condition. The receptacle shall be tarred inside and outside at least once in a year.

9. CONSTRUCTION OF LATRINES:

The inside wall shall be constructed of masonry or stone materials and shall be cement washed inside and outside at least once a year. The dates of cement washing shall be noted in register maintained for this purpose and kept this available for inspection.

10. DISPOSAL OF EXCRETA:

Unless otherwise arranged for by the local sanitary authorities, arrangements for proper disposal of excreta, by incineration at the work place shall be made by means of a suitable incinerator approved by the Asst. Director of public Health of Municipal, Medical Officer of Health as the case may be in whose jurisdiction the work place is situated. Alternatively, excreta may be disposed off by putting a layer of light soil at the bottom of pucca tank prepared for the purpose and covering it with a layer of waste or refuse and then covering it up with a layer of earth for a fortnight (when it will turn into manure).

11. PROVISIONS OF SHELTERS DURING REST:

At every work place, there shall be provided free of cost, two suitable sheds one for meals and other for rest or use of the labourers. The height of the shelter shall not be less than 11 feet from the floor level to the lowest part of the roof.

12. CRECHE:

- a. At every work place at which more than 50 women workers are employed, there shall be provide only hut for the use of children under the age of 6 years, belonging to such women and shall be used for infant's games and play and their bed room. The huts shall not be constructed on the lower standard than the following:
 - i. Thatched roofs.
 - ii. Mud floors and walls.
 - iii. Plants spread over the mud floor and covered with mat.
 - iv. The hut shall be provided with suitable and sufficient opening for light and ventilation. There shall be adequate provision for sweepers to keep the place clean. There shall be two Dhais in attendance. Sanitary utensils shall be provided to the satisfaction of the Health Officer of the area concerned. The use of the hut shall be restricted to children, their attendants and mothers of the children.
- b. Where the number of women is more than 50, the contractor shall provide one hut and one Dhai to look after the children of women workers.
- c. The size of the crèche shall vary according to the number of women workers.
- d. The crèche shall be properly maintained and necessary equipments like toys etc. shall be provided.

13. CANTEEN:

A cooked food canteen on a moderate scale shall be provided for the benefit of workers whenever it is considered expedient.

ODISHA P.W.D CONTRACTOR'S LABOUR REGULATIONS

- 1) **Short title:** These regulations may be called “Odisha Public Works Department Contractor’s Regulations”.
- 2) **Definitions:** In these regulations, unless otherwise expressed or indicated the following words and expressions shall have the meaning hereby assigned to them respectively, that is to say:
 - i. **“Labour”** means a worker employed by the contractor of Odisha Public Works Department, directly or indirectly through sub-contractor or other person, or by an agent on his behalf.
 - ii. **“Fair Wages”** means wages whether for the time or piece work prescribed by the State Public works Department, provided that where higher rates have been prescribed under the Minimum Wages Act.1948, wages at such rates would constitute fair wages.(WD No.22059 dt: 16.8.77).
 - iii. **“Contractor”** shall have the same meaning as defined the Payment of Wages Act and include time and piece rate wages, if any.
- 3) **Display of notices regarding wages etc:** The contractor shall :
 - i. Before he commences his work on contract, display and correctly maintain and continue to display and correctly maintain, in a clean and legible condition, in conspicuous places on the work, notices on English and in the local Indian Language spoken by the majority of the workers, giving the rate of wage prescribed by the State P.W.D/ Electricity Department for the district which the work is done.
 - ii. Send a copy of the notices to the Engineer-in-charge of the work.
- 4) **Payment of wages:**
 - i. Wages due to every worker shall be paid to him direct.
 - ii. All wages shall have to be paid in cash where no food grain is supplied by the department or partly in cash and partly in grain, if food grain is supplied by the Department to the contractor for issue to labour engaged on the work.
- 5) **Fixation of Wages period:**
 - i. The contractor shall fix the wage period in respect of which the wages be payable.
 - ii. No wage period shall exceed one month.
 - iii. Wages of every workmen 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.
 - iv. 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.
 - v. All payments of wages shall be made on a working day.
- 6) **Wage book and Wages cards etc:**
 - 6.1 The contractor shall maintain a wage book of each worker in such forms as be convenient, but the same shall include the following particulars-
 - a. Rate of daily or monthly wages.
 - b. Nature of work on which employed.
 - c. Total number of days worked during each wage period.
 - d. Total amount payable for the work during each wage period.
 - e. All deductions made from the wages with an indication in each case of the ground for which the deduction is made.
 - f. Wage actually paid for each wage period.
 - 6.2 The contractor shall also maintain a wage card for each worker employed on the work.
 - 6.3 The Executive Engineer may grant an exemption, from the maintenance of wage bond, wages cards to a contractor who, in his opinion may not directly or indirectly employ more than 100 persons on the work.

7) Fines and deduction which may be made from wages:

- 7.1 The wages of a worker shall be paid to him without any deduction of any kind except the following-
- a. Fines.
 - b. Deductions for absence from duty, i.e., from the place or places where the terms of his employment he is required to work. The amount of deductions shall be in proportion to the period for which he was absent.
 - c. Deduction for damage to or loss of good expressly entrusted to the employed person for custody or for loss of money for which he is required to account where such damage or loss is directly attributable to his neglect or default.
 - d. Any other deductions which the Odisha Government may from time to time allow.
- 7.2 No fines shall be imposed on a worker and no deduction for damage or loss shall be made from his wages until the worker has been given an opportunity of showing cause against such fines or deduction.
- 7.3 The total amount of fines which may be imposed in any one wage period on a work shall not exceed an amount equal to 10% in a rupee of the wages payable to him in respect of that wage period.
- 7.4 No fine imposed on any worker shall be recovered from him by instalments or after the expiry of 60 days from the date on which it was imposed.

8) Register of Fines, etc:

- 8.1 The contractor shall maintain a register of fines and of all deductions for the damage or loss. Such register shall mention the reason for which fine was imposed or deduction for damage or loss was made.
- 8.2 The contractor shall maintain a list in English and in the local Indian language, clearly defining the acts and omissions for which penalty of fine can be imposed. It shall display such list and maintain it in a clean and legible condition in conspicuous places on the work.

9) Preservation of Register:

The wage register, the wage cards and the register of fines, deductions required to be maintained under these regulations shall be preserved for 12 months after the date of last entry made in them.

10) Powers of Labour Welfare Officer to make investigation or enquiry:

The labour Welfare Officers or any other persons authorized by the Government of Odisha on their behalf shall have the power to make enquiries with a view to ascertaining and enforcing due and proper observance of the fair wage clauses and the provisions of these regulations. He shall at liberty to investigate into any complain regarding default made by the contractor, sub-contractor in regard to such provisions.

11) Report of Labour Welfare Officers:

The Labour Welfare Officers or others authorised as aforesaid shall submit a report of the result of his investigation or enquiry to the Executive Engineer concerned, indicating the extent, if any, to which the default has been committed with a note that necessary deductions from the contractor's bill be made and the wages and other dues be paid to the labourer concerned.

12) Appeal against the decision of Labour Welfare Officer:

Any person aggrieved by the decision and recommendation of the Labour welfare Officer or other authorized person, may appeal against such decisions to the Labour Commissioner within 30 days from the date of the decision forwarding simultaneously a copy of his appeal to the Executive Engineer concerned but subject to such appeal, the decision of the Officer shall be final and binding upon the contractor.

13) Inspection of Registers:

The contractor shall allow inspection of the wage book and wage cards of any of his workers at a convenient time and place after due notice is received or to the Labour Commissioner or any other person authorized by the Government of Odisha on his behalf.

14) Submission of Return:

The contractor shall submit periodical returns as may be specified from time to time.

15) Amendments:

The Government of Odisha may from time to time, add to or amend these regulations and on any question as to the application, interpretation of effect of these regulations, the decision of the Labour Commissioner or any other person authorized by the Government of Odisha on that behalf shall be final and binding on that effect.

Clause-34 The terms and conditions of the agreements have been read/ explained to me and I Sri/Smt certify that I clearly understand them and agreed to abide by these rules.

Date:

Witness

Contractor

ADDENDUM TO CONDITION OF CONTRACT

2. TIME CONTROL.

2.1 Progress of work and re-scheduling programme.

2.1.1. The Executive Engineer/Engineer in charge shall issue the letter of acceptance to the successful contractor. The issue of the letter of acceptance shall be treated as closure of the Bid process and commencement of the contract.

2.1.2 Within 15 days of issue of the letter of acceptance, the contractor shall submit to the Engineer-in-charge for approval and programme commensurate to clause no 2 showing the general methods, arrangements, and timing for all the activities in the works along with monthly cash flow forecast.

2.1.3. To ensure good progress during the execution of the work the contractors shall be bound in all cases in which the time allowed for any work exceeds one month to complete, $1/4^{\text{th}}$ of the whole of the work before $1/4^{\text{th}}$ of the whole time allowed under the contract has elapsed, $1/2$ of the whole of the work before $1/2$ of the whole time allowed under the contract has elapsed, $3/4^{\text{th}}$ of the whole of the work before $3/4^{\text{th}}$ of the whole time allowed under the contract has elapsed.

2.1.4 If at any time it should appear to the Engineer-in-charge that the actual progress of the works does not conform to the programme to which consent has been given, the contractor shall produce, at the request of the Engineer-in-charge a revised programme showing the modifications to such programme necessary to ensure completion of the works within the time for completion. If the contractor does not submit an updated programme within this period, the Engineer-in-charge may withhold hold the amount of 1% of the contract value from the next payment certificate and continue to withhold this amount until the next payment after the date on which the over dues programme has been submitted.

2.1.5 An update of the programme shall be a programme showing the act all progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work including any changes to the sequence of the activities.

2.1.6 The Engineer-in-charge's approval of the programme shall not after the contractor's obligations. The contractor may revise the programme submit it to the Engineer-in-charge again at any time. A revised programme is to show the effect of variations and compensation events.

2.2. Extension of the Completion date.

2.2.1 The time allowed for execution of the work as specified in contract data shall be the essence of the contract. The execution of the works shall commence from the 15th day or such time period as mentioned in letter of award after the date on which the Engineer-in-charge issue written orders to commence the work or from the date of handing over of the site whichever is later. If the contractor commits default in commencing the execution of the work as aforesaid, Government shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the earnest money and performance guarantee/security deposit absolutely.

2.2.2 As soon as possible after the contract is concluded the contractor shall submit a time and progress chart for each milestone and get it approved by the Department. The chart shall be prepared in direct relation to the time stated in the contract documents for completion of items of the works, it shall indicates the forecast of the dates of commencement and completion of various trades of section of the work and may be amended as necessary by agreement between the Engineer-in-charge and the Contractor within the limitation of time imposed in the contract documents, and further to ensure good progress during the execution of the work the contractor shall in all cases in which the time allowed for any work, exceeds one month (save for special jobs

for which a separate programme has been agreed upon) complete the work as per milestone given in contract data.

2.2.3 In case of delay occurred due to any of the reasons mentioned below, the contractor shall immediately give notice therefore in writing to the Engineer-in-charge but shall nevertheless use constantly his best endeavors to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-in-charge to proceed with the works for:

- i. Abnormally bad weather or –
- ii) Serious loss or damage by fire or
- iii) Civil commotion, local commotion of workmen, strike or lockout, officers any of the heads employed on the work or
- iv) Delay on the part of other contractors or tradesmen engaged by Engineer-in-charge, in executing work not forming part of the contract.
- v) In case of variation is issued which makes it impossible for completion to be achieved by the intended completion date without the contractor taking steps to accelerate the remaining work and which would cause the contractor to incurred additional cost or
- vi) Any other cause, which, in the absolute discretion of the authority mentioned, in contract date is beyond the contractor's control.

2.2.4 Request for re-schedule and extension of time to be eligible for consideration shall be made by the contractor in writing within fourteen days of the happening of the event causing delay. The contractor may also, if practicable, indicate in such a request the period for which extension is desired.

2.2.5 In any such case a fair and reasonable extension of time for completion of work may be given. Such extension shall be communicated to the contractor by the Engineer-in-charge in writing. Within 3 months of the date of receipt of such request, Non-application by the contractor for extension of time shall not be a bar for giving a fair and reasonable extension by the Engineer-in-charge and this shall be binding on the contractor.

2.3 Compensation for delay.

2.3.1 If the contractor fails to maintain the required progress in terms of clause-2 or to complete the work and clear the site on or before the contract or extended date of completion he shall without prejudice to any other right or remedy available under the law to the Government on account of such breach pay as agreed compensation the amount calculated at the rates stipulated below as the Executive Engineer (whose decision in writing shall be final and binding) may decide on the amount of tendered value of the work for every complied day/ month (as applicable) that the progress remains below that specified in clause-2 or that the work remains incomplete.

This will also apply to items or group of items for which a separate period of completion has been specified.

Provided always that the total amount of compensation for delay to be paid under this condition shall not exceed 10% of the tendered value of work or to the tendered value of the item or group of items of work for which a separate period of completion is originally given.

The amount of compensation may be adjusted or set off against any sum payable to the contractor under this or any other contract with the Government. In case the contractor does not achieve a particulars milestone mentioned in contract date, or the rescheduled milestone(s) in terms of clause 2.5 the amount shown against that milestone shall be withheld, to be adjusted against the compensation levied at the final grant of extension of time. Withholding of this amount on failure to achieve a milestone, shall be automatic without any notice to the contract. However, if the contractor catches up with the progress of work on the subsequent milestone(s) the withheld amount shall be released. In case the contractor fails to make up for the delay in subsequent milestone(s) amount mentioned against such milestone missed subsequently also shall be withheld. However, no interest, whatsoever, shall be payable on such withheld amount.

2.4 Bonus for early completion.

2.4.1 In case the contractor completes the work ahead of scheduled completion time, a bonus 1% (one percent) of the tendered value per month computed on per day basis, shall be payable to the contractor subject to a maximum limit of 2% (two percent) of the tendered value. The amount of bonus, if payable, shall be paid along with final bill after completion of work.

The Bonus/ Incentive should be paid in respect of individual project for new construction/ substantial additional improvement works, the minimum value for which the Bonus/ Incentive applicable is given below.

<u>Type of work</u>	<u>Minimum Value</u>
1. Building work / P.H. Work	Rs. 40.00 Lakhs
2. Road Work	Rs. 300.00 Lakhs
3. Irrigation works	Rs. 1,000.00 Lakhs

Incentive will be paid with approval of next higher authority of tender accepting authority on completion of original work before original time schedule.

2.5 Management of Meetings.

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

2.5.2 The Engineer shall record the business of management meetings and is to provide copies of his record to those attending the meeting and to the employer. The responsibility of the parties for actions to be taken is to be decided by the Engineer either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

RELEVANT PROVISION IN THIS CONTRACT STANDS MODIFIED ACCORDINGLY.

CHAPTER – II

SPECIAL CONDITIONS OF CONTRACT

SPECIAL CONDITIONS OF CONTRACT

1. DEFINITIONS

In the Contract (as hereinafter defined) the following words and expressions will have the meanings here by assigned to them:

- a) **Approved/Approval** - Means approved in writing.
- b) **Construction Plant** - Means all equipments, appliances or things of whatsoever nature required for the executing, or completion, maintenance of the works or temporary works but do 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 drawings referred to in the specifications, any modifications of such drawings approved in writing by the Engineer-in-charge and such other drawings as may from time to time be furnished or approved in writing by the Engineer-in-charge.
- f) **Engineer-in-charge** - Means the Executive Engineer, in-charge of the work specified or parts of the works under the contract, or such other departmental assistants or sub-ordinates to whom the Executive Engineer, in-charge 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./ B.I.S** - Means Indian Standard Specifications/ 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 terms "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.

2. EARNEST MONEY DEPOSIT.

- i) Tenderers including Govt. undertakings are required to deposit Earnest Money @ 1% of the amount put to tender.
- iii) The earnest money to be pledged in favour of the **Superintending Engineer, U.I. Left Canal Division No. -I, Kusumkhunti** and may be in the following shape.
 - a) Deposit Receipt of any Schedule Bank.
 - b) National Savings Certificate.
 - c) Kisan Vikash Patra
- iv) No Cash/ Cheque payments are accepted.
- v) Earnest money given with one tender previously and submitted with other tender is not to be entertained.

3. TAX CERTIFICATES

The tenderers are also required to furnish Xerox/attested copy of the valid PAN CARD, ITCC (if any), VAT/GSTIN along with tender documents failing which the tender may not be considered. The original are to be shown at the time of opening. The bidders registered out side the State are required to submit an undertaking in the form of an affidavit that they are not registered under the GSTIN Act in the state of Odisha as they have not started any business in the state and they have no liability under the act. But Bidder has to produce GSTIN clearance certificate.

4. TIME OF COMPLETION

The work is to be completed within with in the period indicated in the detailed tender call notice which includes the period of monsoon commencing from the date of issue of order to proceed with the work.

5. PRE BID INSPECTION BY CONTRACTORS

The tenderers are required to go through each clause of PWD form No. F-2 carefully in addition to clause mentioned herein before tendering. In any case the tenderer shall be deemed to have carefully examined the tender documents, visited the site of work and it's surroundings and satisfied himself as the form and nature of the site, approach roads, haul roads, local conditions, assessed all the facilities including requirement and availability of labour and materials needed from complete execution of the work and made an inventory of such information as to the risks, contingencies and other circumstances which would influence or effect his tender before tendering. He should also satisfy himself about the sufficiency of availability of materials in quarry and borrow area. The Department will not be responsible for any misjudgment of the tender on the account for any future claims.

6. VALIDITY OF TENDER

6.1 On the outer cover the tenderers should write the name of the work and authority who had issued the tender. They should submit the tender document in correct identification box. The tender submitted in the wrong box shall not be taken into consideration.

6.2 The tenderer must furnish copy of Registration & GSTIN clearance certificate at the time of delivery of tender document other wise his/her bid shall be declared as non-responsible & shall be liable for rejection.

6.3 The rates quoted shall remain valid for a period of 90 (ninety) days from the last date prescribed for receipt of tenders.

6.4 The tender which is not in the prescribed proforma and is not strictly in accordance with the terms and conditions of the tender call notice is liable for rejection.

6.5 Alternate tenders, conditional tenders and tenders containing indefinite terms will not be entertained. The tenders will be considered given special emphasis on the capability of the tenderer and the implements and earth moving machinery at his disposal for the work.

6.6 Loose letters found in the tender box intimating modification to the tenders already submitted will not be considered.

6.7 Rate quoted should be for finished items of work and for sufficiency as per the description of the schedule of quantity and specification and shall exclude GSTIN but include all taxes including rent. Royalty, labour Cess and general and incidental charges pertinent to the work, other charges of materials, octroi duty, ferry tolls, conveyance charges and other costs on account of land and building including temporary building required by the tenderer for collection of materials storage, housing of staff or other purpose for the work.

6.8 The units and rates in the tender should be written both in words and figures and in case of any discrepancy noted, the units and rates written in words will prevail. The rates should be quoted in Indian Currency.

- i) The tenderer shall bear cost of various incidental sundries and contingencies needed by the work of all within the following or similar category.
- ii) Labour camps and hutments necessary to a suitable scale including contingency and sanitary arrangements medical aids thereon to the satisfaction of the health authorities.
- iii) Water arrangements for laborer as well as for the works. No claim for carriage for water whatsoever will be entertained.

- iv) Fees and dues levied by the Municipal and water supply Authorities.
- v) Suitable equipment and wearing apparatus for the labors engaged in risky operation.
- iv) Suitable fencing, barriers, signals, including parapet and electrical signal where necessary at works and approaches in order to protect the public and employees from accidents.
- vii) No compensation for any damage done by rain or by similarly action during execution of the works shall be paid.
- viii) The tender shall be written legibly and free from erasures, overwriting or correction of the figures. Corrections unavoidable should be made by scoring out the same and initialing dating and rewriting. The tender should show the total of each page and grand total of whole tender.

6.9 The tender is to be decided as per prevailing codal provisions taking into consideration the capacity of the tenderer and equipments available with him for the work. The authority reserves the right to reject any or all tenders without assigning any reason thereto.

6.10 In order to qualify for consideration for award of the contract the tenderer should satisfy the Bid criteria as stipulated in the technical Bid. To substantiate the tenderer is required to submit authentic records duly certified by the Executive Engineer of the Department in support of such experience.

6.11 Rate to be quoted by the contractor for various items of work should be consistent and rational. Tenders with in consistent rates and/ or speculative rates shall be liable for rejection.

6.12 The payment for RA bill will be made in level section measurement and no string section measurement will be considered.

6.13 All the tenderer are required to submit along with their tenders declaration about the names of their relatives employed in Water Resources Department in the prescribed proforma appended. In case they have no relation in Water Resources Department a certificate to that effect shall have to be furnished.

6.14 An affidavit shall be furnished by the contractor at the time of submission of tender paper about the authentication of tender documents including E.M.D.

6.15 The conditions in this detailed tender call notice will form part of the agreement to be drawn by the contractor.

7. AWARD OF CONTRACT

7.1 The tenderer whose tender is selected for acceptance shall within a period of fifteen days upon written intimation being given to him by Registered post deposit, initial security deposit so that the EMD and initial security deposit will be 2% (two percentage) +additional security 1% in case of machineries to be hired from outside, of the accepted tender amount and sign the agreement in the PWD form F-2 (Schedule SLV. No.61) for fulfillment of the contract in the office of the Engineer-in -charge. This initial security deposit together with the EMD and the amount of 5% deduction from each running bill as per F-2 agreement shall be retained as security deposit for the fulfillment of this contract. This security deposit will carry no interest. Failure to enter into the required agreement and to pay the security deposit as above within the specified period shall entail forfeiture of the earnest money. No tender shall be finally accepted until the required amount of security money is deposited. The written agreement to be entered into between the Contractor and the Govt. shall be the foundation of the rights of both the parties and the contract shall be deemed to be incomplete until the agreement is first signed by the Contractor and then by the Executive Engineer, the department will accept the initial security deposit in the accepted from prescribed in clauses as above pledged in favor of the Engineer-in -Charge and in no other form. The Security deposit deducted from each running bill will be 5%.If the contractor express his request in writing he will be permitted to convert the security deposit of 5% into interest bearing

securities (for an amount not less than Rs. 10.00 lakh in each case which will be pledged in favour of the Executive Engineer)

Successful bidder registered under other state government/ MES/ Railways/ CPWD has to register under the State PWD before signing of the agreement.

7.2 The work may be splitted up and distributed among several contractors if considered necessary in urgency of circumstances of the work and the contractor will not be entitled to any compensation on this account.

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

7.4 The earnest money deposited by the unsuccessful tenderers will be refunded as per relevant rules in force.

7.5 Super/ Special Class contractors shall employ under him one Graduate Engineer and two Diploma holders belonging to the State of Odisha. Likewise an 'A' Class contractor shall employ under him one Graduate Engineer or two Diploma holders belonging to state of Odisha. The employment of such graduate Engineer and Diploma holders under the Contractor shall be full time and continuous and they shall not be superannuated, retired, dismissed or removed personnel from any State Government/Central Government Service / Public Sector Undertakings /Private companies and firm or be ineligible for appointment to Govt. service. The contractor shall pay them monthly emoluments, which shall not be less than the emoluments of the personnel of equivalent qualification employed under the State Govt. of Odisha. The Chief Engineer Roads, Odisha may however assist the contractor with names of such unemployed Graduate Engineers and Diploma holders if the contractor seeks for such help.

The name of such Engineering personnel appointed by the contractor who would be supervising the works should be intimated to the tender receiving authority along with each tender. Each bill of the contractor shall be accompanied by an employment roll of engineering personnel together with certificate of the Graduate Engineer or Diploma holder employed by the contractor to the effect that the work executed as per the bill has been supervised by him.

7.6 No part of the contract shall be sublet without written permission of the Engineer-in-charge or any transfer be made by power of attorney authorizing others to receive payment on behalf of the contractor.

7.7 No tenderer is permitted to furnish their tender in his own manuscript paper.

8. OBSERVATION OF LAWS AND LOCAL REGULATIONS, ACCIDENTS AND SAFETY MEASURES:

The Contractor shall observe all State and Local rules and regulations so far as they are relevant in controlling the operations involved carrying out the work and indemnify the Govt and employees of the Govt. against all suite losses, demands, actions, judgments and cost of every kind resulting from the commissions and omissions of the contractor and his employees in violation of the said rules and regulations.

8.1 Department for payment of the compensation under workmen's compensation act VI of 1923 on account of the workmen being employed by him and the full amount of compensation of awarded by any competent court of law to the workmen will be recovered from the contractor and will be paid to the workmen as per direction of the court.

8.2 The contractor shall have to abide by the Labour Laws and Rules in vogue and shall provide at his own cost housing, watering supply, sanitation, medical aid and other facilities to the labourers engaged in the work as required under Labour Laws and Regulations. The Contractor shall not employ labour of minor age group.

8.3 The contractor shall have to abide by the safety code introduced by the Govt. of India, Ministry of works. Housing and supply in their standing order No.44 to 50 dated 25.11.57.

8.4 Blasting where required shall be taken up only when proper precaution have been taken for the protection of lives and property in accordance with I.S. 4081 – 1967 safety code for blasting and related drilling operations. Only persons licensed for and thoroughly conversant with the working methods and precaution to be observed in using explosives shall carry out blasting. To avoid the danger of injury from flying debris, all personnel in a blasting area shall retreat to an adequate cover. While carrying out excavations, adequate precautions in accordance with I.S. 3764 – 1966. Safety code for excavation works shall be taken for the safety of workers. The contractor shall have to abide by the blasting rules & regulations.

8.5 In case of any damage to Govt. or public property or to the property owned to any persons of firms or bodies due to negligence or any such action of the contractor resulting in damage or stoppage or work thereby, the contractor shall be liable to be penalized to the extent of the assessed value of the damage or the out turn lost.

9. CHANGE OF ADDRESS OF CONTRACTOR:

The Contractor shall inform the Engineer and the Department any change of his postal address from time to time from the one given in the tender paper and authorize any person with due intimation to the Engineer-in-charge and the Department to receive instruction or communication from the Department on his behalf, failing which the said undelivered instructions and communications published in the notice board of the Engineer-in-charge shall be treated to be intimation to the Contractor and the same shall be binding on him.

All the correspondence should be made in English.

10. ARCHAEOLOGICAL FINDINGS

The contractor shall deliver to the Engineer-in-charge all articles of archaeological importance as and when those are found in course of execution.

11. CONTEMPORARY CONTRACTORS

The contractor shall take into consideration the needs and requirements of the other contractors if any, working in the vicinity during the tenure of his contract and shall neither take nor cause to be taken any steps or actions that may cause disruption disturbance to their work, labour or arrangements etc. Any action by the contractor that the Engineer-in-charge in his unquestioned direction may consider as infringement of the above would be considered as a breach of contract and he may take such action against the contractor as deemed fit.

12. TAXES & CESS:

a. The rates quoted by the Contractor shall be deemed to exclude GSTIN but other taxes including royalties of all materials that the contractor will have to purchase for performances of this contract.

b. SALES TAX / GSTIN:

2% GST to be deducted from work bills where agreement value exceeds Rs 2.50 Lakh. (to be applicable as per Government Notification).

c. **INCOME TAX:**

Income Tax will be deducted from the gross amount of each on going account & will be recovered from the contractor towards Income Tax as applicable from time to time (Provisional or as advised by Income Tax Department)

d. **Labour Cess :**

Labour Cess will be deducted from each contract bill as applicable from time to time.

13. INTEREST:

Under no circumstances interest is payable for dues of the Contractor if any lying unpaid or payable for the work.

14. PLANS AND DRAWINGS:

The work has to be carried out in accordance with the Odisha detailed standard specification and relevant I.S. specification pertaining to the tendered items of work and specifications and special conditions appended here to Drawings will be supplied to the contractor to execute the work in general conformity therewith. These drawings will be supplemented by such additional, general and details drawings or directions as may be considered necessary or desirable as the work progress. No claim will be entertained due to change of drawing.

Where details shown on those drawings differ from the requirement of the specifications, the requirement of the specifications shall govern and the contractor shall not work without proper drawings, direction and instructions. He shall check all drawings carefully and bring to the notice of the Engineer-in-charge any error and omissions and discovered, where upon the Engineer-in-charge shall prepare revised additional drawings and specifications as may be required. All such additional general and detailed drawings will be binding on the Contractor under the same terms and conditions as provided in clauses of F2 agreement. The decision of the Engineer-in-charge with regards to specification is final, for which no compensation or claim will be entertained.

15. CONSTRUCTION PROGRAMME:

i) The contractor shall have to submit the construction programme i.e. the plan and programme of execution for completion of the work at the time of agreement to the Engineer-in-charge. the construction programme should be such that, road work will commence after completion of 75% of lining work, or otherwise after completion of the canal work including structure in full shape. The Engineer-in charge shall have to approve the said construction programme by fixing a pragmatic mile stone with reference to the provisions laid down under clause 2(a) of the condition of the contract, for timely completion of the work and accordingly the work is required to be executed.

ii) If the revised construction programme is required on account of non-completion of work for which Extension of Time is required or for disruption of the execution in the stipulated period, the contractor shall have to submit the same to the Engineer-in-charge along with the Extension of Time application, if extension of time is prayed for or immediately after disruption of the execution mentioning the clear reasons as the case may be, for revision of work programme. The decision of the Engineer-in-charge is final and binding on the contractor. The contractor shall arrange for additional shifts whenever necessary to suit the revised construction programme. No extra payment on this account is admissible.

iii) The contractor has to make adequate lighting arrangements for night works wherever necessary in fulfillment of the construction programme at his own cost and no extra payment on this account is admissible.

16. AVAILABILITY OF LABOUR:

Labour required for the work may not be available to the full extent in the locality. The contractor may have to import labour from outside.

He shall arrange and regulate the labour strength according to necessity. The Department shall not entertain the claim for any idle labour whether or not at the fault of the contractor or due to any other reasons whatsoever. The contractor's item rate in the tendered are deemed to have adequate coverage on account of import and employment of required labours and providing facilities and amenities to them.

17. SUSPENSION OF WORK:

The Engineer-in-charge may from time to time by written orders without in any way deviating the contract, direct the contractor to suspend the work or any part thereof at such time and the contractor shall not after receiving such written order proceed with the work or items thereof ordered to be suspended until he shall have received a written notice from the Engineer-in-charge to proceed with the work again.

Should the work be ordered to be suspended directly in the interest of safety of the work due to acts of God or major war or indirectly as a result of the contractor not complying with any of the provisions of the contract in respect of the quality of the materials, workmanship programmed of execution he shall not be entitled to claim any compensation for any loss he may be put to directly or indirectly for such suspension of work.

During the period of suspension of the work the contractor shall properly protect and secure the works as necessary in the opinion of the Engineer-in-charge.

18. ITEMS NOT COVERED IN THE SCHEDULE:

The items of work not covered in the agreement shall be paid in the current schedule of rate of the State and those not covered by the said schedule of rates will be paid on actual analysis approved by competent authority.

19. FORCE MAJUORE:

The contractor shall take all precautions to protect the work from damages due to rains, flood, cyclones, fire or by any other natural calamity, public agitation or riots etc and also make good such damage if any at his own cost during the period of execution and till the work is taken over by the Department. No compensation will be paid to the contractor on account of idle laborers due to above reason.

20. TOOLS AND PLANT:

The contractor should arrange necessary tools, plant and machineries for the efficient execution of work at his own cost and the rates quoted should be inclusive of such charges. The department may lend on hire some machinery for use in the work subject to their availability on terms and condition as shall be specified by the Department from time to time and after execution of necessary agreement. But on the plea of non supply of machineries by the Department, the works should not be delayed nor any compensation on such account is tenable nor will the contractor be eligible for any time extension on that score.

21. HAUL ROADS:

All haul roads to Borrow areas and quarries will be constructed and maintained by the contractor at his own cost. The roads so constructed shall be allowed to be used free of cost by agencies working in other reaches of the canal including Govt. Department unless otherwise restricted by the Engineer-in-charge.

22. DEPARTMENTAL STOCK MATERIALS:

The contractor may be issued stock materials as per terms and conditions specified under Clause - 8 of F-2 contract for Bonafide use in the work. It shall be his responsibility to make all arrangements for proper transport, safe storage, watch and ward of materials and all other charges incidental there on. No payment shall be made on this account to the contractor separately.

He shall be responsible for any loss or damage of departmental materials and machinery during transit and execution of work. The stock materials to be issued by the Department and details thereof is annexed separately Annexure-IV.

23. CONSTRUCTION SHEDS:

Temporary structures may be erected by the contractor at his expenses for storage sheds, office, residence, labour hutments etc. on the land available with the Department with the permission of the Engineer-in-charge. On completion of the work these structures should be dismantled and the site cleared and handed over to the Department.

- 23.1. In the event of delay in supply of departmental materials or supply of detailed structural designs for unavoidable reasons, reasonable extension of time will be granted on the application of the contractor. But no claim for monetary compensation will be entertained under any circumstances.
- 23.2. Any slip debris and other foreign materials deposited on the working region on account of rains, flood or any other cause prior to and during the course of execution and till the work is completely taken over the department have to be cleared by the contractor at his cost. The rates quoted by the contractor shall be inclusive of all such contingencies.
- 23.3. The contractor shall not interfere with the execution of water supply or electrical arrangements or any other works entrusted to any other agency by the Department at any time during progress of work.
- 23.4. It shall be the responsibility of the contractor to make such arrangements as may be required from time to time to protect men, machinery and the works against damage due to flood and the department accepts no liability whatsoever for damage or loss on this context.

24. SITE CLEARANCE:

Such portion of the site of work as may be considered necessary for the purpose of alignment and demarcation shall be cleared of jungle, if any by the contractor at his own cost.

The limits of the structure within which work will be carried out within the scope of the contractor shall be suitably demarcated by the Department.

The contractor has to supply necessary labour at his own cost fixing benchmark pillars/alignment pillars / alignment and pegs and also for layout, leveling and profiling and maintaining the same till completion of the work. The contractor at his own cost will supply cement concrete pillars required for layout. The generally layout and Bench mark pillars already laid out by the Department is to indicate generally this alignment of Canal in the field. The contractor while taking up excavation works will preserve original pillars.

24.1. The contractor should keep himself in touch with the Engineer-in-charge for smooth execution of work and arrange adequate labour depending upon the work load and working space available. No claim whatsoever for detention / idle of labour will be entertained.

25. OTHER CONTRACTORS:

Contractor's operations shall be so planned as to prevent water from his work flowing or finding way in to the neighboring reaches. In the event of water from his reach flowing or finding way into the neighboring or subsequent reaches, the respective contractor shall be liable to pay compensation towards any expenditure incurred and loss or damage sustained by the concerned contractor(s) on account of the said reasons unless they otherwise mutually settle the issue amongst themselves. Provided that if there, by any dispute among the contractors on the account of such compensation arises, the decision of the Engineer-in-charge shall be final and conclusive and binding on concerned contractor.

26. ORDER BOOK:

An order book with pages serially numbered will be issued by the Executive Engineer shall be maintained by the Sectional Officer systematically till completion of the work and there after surrender it, to the Engineer-in-charge for record. The order book shall be available at the site during work hours for recording instructions relating to the work. Order regarding the work as and when necessary shall be entered in this book by the Executive Engineer or his superiors in office with their dated signature in exercise of statutory power vested on them which shall be duly noted by the contractor or his authorized agent with his dated signature. The Superintending Sub-ordinate, the in charge of work shall also record his observation of defective work and such orders / observation entered in this book, and noted by the contractor agent shall be considered to have been duly given to the contractor, similarly orders entered by the Executive Engineer and Chief Engineer shall be deemed to have been duly issued by the Engineer - in - charge for the contract.

27. CLAIM BOOK:

A claim book of pages serially numbered shall be issued by the Executive Engineer to the contractor who shall maintain it systematically and securely, and shall record in it such items as are not covered by his contract and or claimable as extra claim shall be entered in this book under the dated signature of the contractor or his duly authorized agent at the end of each month.

A certificate should be furnished by him along with those claims to the effect that beyond the claims entered in the book, the contractor has no other claims up-to-date. If in any month there are no claims, a recorded a certificate to that effect should be furnished by the contractor in the claim book. Each claim must be definite and should give also as far as possible the quantities as well as the total amount claimed. The claim book must be submitted regularly by the contractor to the Engineer-in-charge by the 10th day of each month for his orders. Claims not made in this manner are liable to be summarily rejected. The claim book shall be finally surrendered by the contractor to the Engineer-in-charge for record.

28. RULE TO VERBAL ORDER:

It shall be the contractor's responsibility to get any verbal orders, instructions or directions confirmed in writing without which no cognizance will be taken of such verbal orders, instructions or directions for settlement of any claim arising thereof.

29. STATUTORY OBLIGATIONS OF CONTRACTOR:

The contractor shall have to arrange water required for the work at his own cost.

- 29.1. The contractor shall have to construct and maintain coffer dam as required for the work during execution at his own cost.
- 29.2. Bailing out water from foundation, construction of cross bund dewatering wherever necessary during execution of the work shall have to be done by the contractor at his own cost.
- 29.3. Gangway, scaffolding or any such arrangements required for the work are to be provided by the contractor at his own cost as per direction of the Engineer-in-charge. The Department will have the right to inspect such arrangement made for the work and reject partly or fully such structures found defective in opinion of the Engineer-In-Charge.
- 29.4. Department shall not pay compensation to the contractor for the damage occurred to the materials and work entrusted to his due to natural calamities.

30. DEPARTMENTAL RIGHT FOR DEVIATION IN QUANTITIES:

Right is reserved to make such increase or decrease in quantity or item of work mentioned in the schedule attached to the tender notice as may be considered necessary for satisfactory completion of the work and such increase or decrease shall in no way invalidate the contractor.

31. EMERGENCY MEASURE:

The work may be split up and distributed among several contractors if considered necessary on the emergency of the circumstances of the work and the contractor will not be entitled to any compensation to this account.

32. SAFETY OF MACHINERIES:

Unusual flood may occur during the working season. In the event of overtopping or breach in the cofferdam/embankment due to such flood in the working season resulting in flooding of the working area or outside the working area, the contractor shall make his own arrangement to shift the machineries and equipments, materials etc. to a safe place at his own cost. The work shall be resumed after the floods. Necessary reconstruction of the cofferdam / embankment clearing the working area of debris and silt shall have to be done by the contractor at his own cost. Suitable extension of time may however be granted in such eventualities at the request of the contractor, but no compensation whatsoever shall be paid in this regard.

33. CONTRACTOR DYING, BECOMING INSOLVENT, INSTANCE OR IMPRISONED:

(a) In the event of the death, insanity, insolvency and imprisonment of the contractor or the contractor being a partnership or firm becomes dissolved or being a corporation goes into the liquidation, the contract may be terminated by notice in writing posted at the site of work and advertised in one issue of the local newspaper and all acceptable works shall be paid for after recovering all the contractors due to Govt. there from at appropriate rates to the person or persons entitled to receive and given dishonor-age for the payment.

(b) If the contractor becomes bankrupt or has a receiving order made against him or compound with his creditor or being a Corporation commence to be wound up not being a voluntary winding up for the purpose only an amalgamation or reconstruction or carry on its business under a receiver for the benefit of the creditors of any of them, the Department shall be at liberty.

- i) To give such liquidator receiver, or other person the option of carrying out the contract subject to his providing a guarantee for the due, faithful performance of the contract up to an amount to be determined by the Department.

- ii) To terminate the contract forthwith by notice in writing to the contractor or to the liquidator or receiver or to any person in whom the contract may become vested and to act in the manner as per prevalent clauses of F-2 contract.

34. MEASUREMENT OF EACH WORK SHALL BE TAKEN AS FOLLOWS:

Before commencement of work initial levels and to determine the final measurement of the work, final levels of the embankment or canal or ground or structural work as the case may be, shall be taken in presence of the contractor. The contractor will satisfy himself about the correctness of the initial and final levels entered in the level book issued by the Engineer-in-charge and in token of the acceptance of the said levels the contractor shall have to sign in each page of level book in which the said levels are recorded. Basing on these levels, the gross quantity of work executed by the contractor shall be arrived at. After completion of the work the contractor shall be given a written notice to attend the final measurement. On receipt of the notice, the contractor must have to attend the final measurement failing which the measurement ex-parte shall be taken by the Engineer-in-charge which shall be binding on the contractor. In case of the abandonment of work, if it is decided by the Engineer-in charge that final measurements of executed work shall be taken, the same procedure shall be followed as in case of final measurement on completion of work. It is the responsibility of the contractor to make the site free from all problems to take measurement by the Executive Engineer or his authorized officer. If, in the opinion of the Engineer-in-Charge, the site is not free from problem for measurement and the contractor does not take any corrective measures to get rid of same, the Engineer-in-Charge shall make the site free from problem to take the measurement at the cost of the contractor and to determine cost involved there of, certificate by the Engineer-in-Charge for the purpose, shall be conclusive and binding.

- 34.1. The Engineer-in-charge shall decide the contractual matters in accordance with codes, rules and acts in vogue which shall be binding on both parties.

35. REMOVAL OF CONTRACTOR'S MEN:

The contractor shall on the written direction of the Executive Engineer immediately removed from the works any person employed thereon, who may, in the opinion of the Engineer-in-charge, be incompetent or has misconduct himself. Such person shall not be employed again on the works without the written permission of the Engineer-in-charge.

36. DETAILS CALL NOTICE BEING PART OF CONTRACT:

The detail Tender Call Notice and all the Annexure there to will form the part of the agreement when the work will be awarded to the contractor. All the correspondences made with the contractor and all his correspondences with the department after the tender is received will also be attached with the agreement.

37. FAIR WAGES CLAUSE:

The contractor should abide the fair wage clause introduced by the Govt. and shall not pay less than the fair wages fixed by the Govt. to the laborer engaged by him in the work.

38. LABOUR LICENSE AND REGISTRATION:

The contractor is to furnish labour license as per the relevant labour Act and rules in force before signing the agreement, failing which execution of agreement will not be entertained.

39. PRICE PREFERENCE:

- a) Schedule Caste and Schedule Tribe tenderers will be given concession where their tenders are within 10% of the rate quoted by the lowest tenderer for any work. The work may be considered for award to him / them at the lowest tendered rate in relation of rule 18 of O.G.F.R. Vol. 1 Para 2.5.14 of O.P.W.D. Code vide Govt. of Odisha Works Deptt. Circular No.27748 dated 11.10.97.
- b) Preference in price will also be given to M/s Odisha Construction Corporation Ltd. as per relevant Govt. Circular.

40. QUALITY CONTROL AND TESTING:

The quality control organization of department will conduct necessary tests to ensure specifications and quality of execution of work as per standard procedures in vogue. The testing charges of Reinforcing Bar will be borne by the contractor.

41. TESTING OF THE STRUCTURES:

During execution of work, the contractor shall arrange the requisite equipments for testing of the work if found necessary at his own cost.

42. DEFECTS LIABILITY:

The contractor shall be responsible to make good of the defects at his own expense, which may develop or may be noticed before the expiry of one year from the certified date of completion and which is attributable to the contractor. All notices of such defect shall be given to the contractor promptly. In case, the contractor fails to make good of the defects, the Engineer-in-charge employ other persons/ agencies to make good of such defect, and all expenses consequent thereof and incidental thereto, shall be borne by the contractor.

In the event Government takes over portions of works, as they are completed, the liability of the contractor under this clause for those portions shall extend to a period of one year from the actual date on which portions of the works are taken over to the possession of the Department.

43. 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 work, interpretation of the contract drawing and contract specification, mode of procedure and the carrying out of the work, the decision of the Engineer-in-charge, which shall be given in writing, shall be final and binding on the contractor. The Engineer-in-Charge's final authority applies to technical consideration and does not include decisions regarding sums due to or from the contractor for extension of time.

44. PAYMENT OF PRICE ESCALATION IN THE CONTRACT CONTAINING THE PRICE ADJUSTMENT CLAUSE:

With regard to payment of price escalation during the extended period when the reasons for delay are not attributable to the contractor, it is clarified that where the extension of time is allowed by the Govt. / Higher authorities with the benefit of price escalation in respect of the balance work left for execution, pragmatic revised milestones should be fixed for completion of the balance work. The escalation calculation should be based on the milestones which could have been achieved by the contractor during the agreement period and extended period and should be limited to the quantities stipulated therein. Payment of price escalation during extended period will be paid subject to approval of the same by the Government of Odisha, Department of Water Resources.

45. SETTLEMENT OF DISPUTE:

If the contractor considers any work demanded of him to be outside the requirements of the contract or considers any drawing record or ruling of the Engineer-in-charge, on any matter in connection with or arising out of the contract or carrying out of work to be unacceptable, he shall promptly ask the Engineer-in-charge in writing for written instruction or decision. There upon the Engineer-in-charge shall give his written instructions or decision within a period of thirty days of such request. Upon receipt of the written instruction or decision, the Contractor shall promptly proceed without delays to comply with such instruction or decision. If the Engineer-in-charge fails to give his instructions or decision in writing within a period of thirty days after being requested or if the contractor is dissatisfied with the instruction or decision of the Engineer-in-charge, the contractor may within thirty days after receiving instructions or decision of the Engineer-in-charge will approach to the higher authority who shall afford an opportunity to the contractor to be heard and to offer evidence in support of his appeal. The Authority shall give his decision within a period of thirty days after the contractor has given the said evidence in support of his appeal, which shall be binding upon the contractor.

46. RESOLUTION OF DISPUTES:

- a) All claims are to be settled by a Civil Court of Competent jurisdiction by way of Civil Suit.
- b) The contractor shall not be entitled to invoke Civil Suit until and unless he has completed the work or until the Govt. has made alternative arrangements for completion of work in question as the case may be.
- c) The pendency of Civil Suit proceedings shall not dis-entitle the Government for completion of the work.

47. JURISDICTION OF COURT:

For the purpose of jurisdiction in the event of dispute, if any contractor should be deemed to have entered into within the State of Odisha and it is agreed that neither part to the contractor nor the agreement will be competent to bring a suit in regard to matters covered by this contract any place outside the state of Odisha.

- 47.1. If any further necessary information is required, the Engineer-in-charge will furnish such information on written request, but it must be clearly understood that tender must be received in order and according to instruction / specifications appended herewith.

48. CEMENT:

The Cement manufactured inside the State of Odisha is to be used as mentioned in Technical Specification. (Refer clause 31 of condition of contract).

49. STEEL:

Reinforcement bar manufactured by Steel Authority of India Ltd. (SAIL) is to be used. (Refer clause 31 of condition of contract).

50. BITUMEN:

Bitumen manufactured by Indian Oil Corporation Ltd. (IOCL) is to be used. (Refer clause 31 of condition of contract)

CHAPTER – III

TECHNICAL SPECIFICATION

SECTION - 1

GENERAL SPECIFICATION

The terms the India Standard Specification herein after referred to as BIS as used therein means the relevant Bureau of Indian Standard codes with all amendments published up to the date of Submission of tenders. A statement of relevant BIS is applicable to this contest is enclosed.

LIST OF INDIAN STANDARDS

Sl. No.	Short Title	B.I.S Number
I. CEMENT		
1.	Specification to ordinary Portland cement 33 grade (4 th Rev)	269-1989
2.	Specification for Portland Pozzolana Cement	1489-1976
3.	Portland Slag Cement (Fourth revision)	455-1989
4.	Method for physical tests for hydraulic cement (Reaffirmed 1980)	4031-1968
5.	Method of Chemical analysis for hydraulic cement (First revision)	4032-1985
6.	Rapid hardening Portland cement	8041-1978
7.	Hydrophobic Portland cement	8043-1978
8.	High Strength ordinary Portland cement	8112-1976
II. AGGREGATES		
1.	Specification for coarse and fine Aggregates from natural source for concrete (Second Revision)	383-1970
2.	Specification for sand for masonry mortars	2116-1965
3.	Method of Tests for aggregates for concrete	2385-1969 (Part- I to Part- VIV)
4.	Standard sand for testing of cement (First revision) with amendment 1 and 2 Reaffirmed 1980	650-1966
5.	Methods for sampling of aggregates for concrete	2430 -1969
6.	Method of test for determining aggregates impact value of soft coarse aggregates	5640-1970
III. STEEL		
1.	Code of practice for bending and fixing of bars	2502-1963
2.	Specification for cold worked steel deformed bars for concrete reinforcement	1786-1979
3.	Code of practice for welding of MS Bars used for reinforced concrete construction.	2751-1966
4.	Code for practice for use of Metal arc welding for general construction of mild steel	818-1989
5.	Deformed bars for concrete reinforcement hot rolled mild steel and medium tensile steel (Revised)	1139-1966
6.	Recommendations for detailing of reinforcement in reinforced concreted works	5525-1969
7.	Specification for Mild Steel and medium tensile steel Bars for Concrete reinforcement.	432-1966(Part I)
8.	Code for practice for safety and health requirement in Electric and Gas welding and cutting operations	818-1968
Sl. No.	Short Title	B.I.S Number
9.	Code for practice for fire precautions in welding and cutting operation.	3016-1965
10.	Measurement of building and Civil Engineering works, method part VIII steel work and iron work	1200-1974 (Part VIII)
11.	Code of procedure for manual or metal ARC and welding of Mild steel	823-1964
12.	Specification for filler rods and wires for gas welding	1278-1972
13.	Recommendations for welding cold worked steel bars for reinforced concrete construction	9417-1979
14.	Hard drawn steel wire fabrics for concrete reinforcement	1566-1982

IV. CONCRETE		
1.	Method of Measurement of building and Civil Engineer work Part-II cement concrete works.	1200-1968 (Part-II)
2.	Code of practice for plain and reinforced concrete	456-2000
3.	Specification for pre cast concrete coping blocks.	5751-1969
4.	Methods of tests for strength of concrete	516-1959
5.	Code of practice for laying in situ cement concrete lining on canals	3873-1993
6.	Specification for Admixtures for concrete	9103-1979
7.	Method of Test for Autoclaved cellular concrete products.	6441-1972-73 (Part-I to IX)
8.	Method of Sampling and Analysis of concrete	1199-1959
9.	Specification of Batch type concrete mixtures (Second Revision)	1791-1968
10.	General requirements for Concrete Vibrators immersion type	2505-1980
11.	Specification for concrete vibrating tables	2514-1963
12.	Method of test for permeability of cement mortar & concrete	3085-1965
13.	Specification for fly ash for use as pozzolana as admixture for Concrete	3812-1981 (Part-II)
14.	Specification for Portable swing weigh batch for concrete (single and double bucket type)	2722-1964
15.	Code of practice for installation of joints in concrete pavements	6509-1972
16.	Code of practice for general construction of plain and reinforced concrete for dams and other massive structures	457-1957
17.	General requirement for concrete vibrator screed board type (First revision)	2506-1985
18.	Code of practice for concrete structures for shortage of liquids	3370 (Part-1 to 4)
19.	Code of practice for use of immersion vibrator for consolidating concrete (First revision)	3558-1983
20.	Method for testing performance of batch type concrete mixer	4634-1968
21.	Form vibrators for concrete	4656-1968
22.	Concrete batching and mixing plant	4925-1968
23.	Ready mixed concrete (Scond revision)	4926-1976
24.	Code of practice for sealing joints in concrete lining on canals	5256-1992
25.	Vibrating plate compactor	5889-1970
26.	Concrete transit mixer and agitator	5892-1970
27.	Concrete pavers	7245-1974
28.	Concrete slump test apparatus	7320-1974
Sl. No.	Short Title	B.I.S Number
29.	Method of making curing and determining compressive strength of accelerated cured concrete test specimens.	9013-1978
30.	Specification for 43 Grade Ordinary Portland Cement (First Revision)	8112-1989
31.	Specification for 53 Grade Ordinary Portland Cement (First Revision)	12269-1987
32.	Specification for admixtures for concrete (First Revision)	9103-1999
V. OTHER SUBJECTS		
1.	Safety code for scaffolds and ladders part I scaffolds	3696-1966
2.	Safety code for scaffolds and ladders Part 2 ladders.	3696-1966 (Part-II)
3.	Recommendation s on stacking and storage of construction materials at site.	4082-1977
4.	Plywood for general purposes (Second revision amendment 1 to 3)	303-1975

5.	Test Sieves	460-1985
6.	Code practice for under drainage of lined canals (2nd revision)	4558-1995
7.	Code of for practice for in situ permeability test	5529 (Part-1 & 2)
8.	Structural steel (Standard quality) (with amendment No.1 to 3)	IS: 226-1975
9.	Hard drawn steel wires (Third revision)	IS: 432-1982 (Part-II)
10.	Concrete pipes (with and without reinforcement) (2 nd revision)	IS: 458-1971
11.	Code of practice for laying of concrete pipes	IS: 783-1959
12.	Specification for mild steel tubes, tubular and other wrought Steel fittings Part-I mild steel tubes (fourth revision) (With Amendments No. 1 to 5)	IS:1239-1979
13.	Hard drawn steel wire fabric for concrete reinforcement (Second revision)	IS: 1566-1982
14.	Asbestos cement pressure pipe (Second revision)	IS: 1592-1980
15.	Preformed filler for expansion test in concrete payment and structures (non extruding and resilient type)	IS: 1838-1961
16.	Cast iron detachable joints for use with asbestos cement pressure pipes.	IS:8794-1978
17.	Structural steel (Fusion welding quality) (Second revision)	IS: 2062-1980
18.	Code of practice for laying of cast iron pipe (With amendment No. I)	IS: 3114-1965
19.	Methods of testing for concrete pipes	IS 3597-1966
20.	Rubber sealing rings for gas mains water mains and sewers	IS: 5382-1969
21.	Centrifugally cast (spun) iron low pressure pipes for water gas and sewage (First revision)	IS: 6163-1978
22.	Code of practice for laying of asbestos cement pressure pipes	IS: 6530-1972
23.	Cast iron detachable joints for use with asbestos cement pressure pipes	IS: 8794-1978
24.	Other Publications: Ministry of shipping and transport Specification for Road and Bridge works	No. 7900

In addition to the relevant BIS code, the specifications prescribed and guidelines issued by Central water Commission Standard Specifications shall also be followed where BIS specifications are not available.

All works of the contract shall be executed as per the specific and relevant clause/ clauses of relevant I.S. code unless otherwise specified. Materials used should confirm to the desired standards prescribed in the relevant codes. Wherever a Para of IS Code is cited in specification, it goes without saying that the latest revision of the specification subsequently, shall apply. For the purpose of relevancy or otherwise of any provision of the I.S. Code referred to, the decision of the Engineer-in-charge shall be final and binding.

SECTION – 2 **SITE OF WORK**

2.1 DISCHARGE RECORDS

The Hydrological data, pertaining to the canal and the streams crossing the canal furnished in the relevant report and drawings, are for information of bidders and contractors. It should be noted that the data used in preparing these particulars were recorded at locations different from the work site. The Government (i.e Govt. of Odisha) does not guarantee the reliability or accuracy of any of the data, shall assume no responsibilities for any conclusions or interpretations that may be made from them. The contractor shall undertake at his expense such studies as are necessary to assess the reliabilities and accuracy of the information presented in the Data.

2.2. SETTING OUT OF WORK

2.2.1 Permanent bench marks shall be fixed at suitable location connecting permanent bench marks fixed by Survey of India. Temporary Bench Marks shall be set up by the Department at every 0.5 Km intervals at convenient locations along the canal to serve as reference levels. The contractor shall establish additional reference Bench Marks as may be needed at his own cost for facilitating the setting out and taking levels for measurement of work, with the approval of the Engineer-in-charge. The bench mark shall be marked on a concrete pillar 30 cm.(L) x 30 cm (B) x 75 cm (H) which shall be embedded 55 cm into firm ground and projecting 20 cm above the ground. The Bench Mark pillar shall be constructed in plain cement concrete of M-10. The pillar shall be protected from being disturbed. The RL of bench marks shall be conspicuously carved and painted on the pillar.

2.2.2 Before starting any work and during execution (if required), the contractor shall erect reference bench marks, reference lines and check profiles at convenient locations as per the direction of the Engineer-in-charge. The centreline of the canal and the reference line for all alignments for demarcation purpose shall be laid by dug-belling on the ground. The reference line shall comprise the base line properly dug-belled on the ground with the numbered concrete/ masonry RD pillar suitably spaced.

2.2.3 Centre line of the canal shall be marked by fixing pillar/ stone at 30 m intervals. Profiles of the canal in filling and in moderate cutting shall be marked at 50 m intervals in straight reaches and at 25 m intervals in curves. A reference line shall also be marked on ground away from the outer edges of cutting and filling with pillars at suitable intervals for future reference.

To ensure correctness of execution, the edges of cutting and the outer toe lines of canal in filling should be marked by fixing pillars or pegs at suitable intervals or by dug- belling.

2.2.4 The check profiles shall be located 15 m apart or longer as directed by the Engineer-in-charge to serve as a guide for execution of all slopes and steps to the elevations and profile(s) indicated in the approved drawings. All important levels and all reference points with respect to bench marks and reference shall be fixed and co-related by the contractor as per directions of the Engineer-in-charge.

2.2.5 The zones of full cutting section, full filling section, partial cutting and filling section shall be separated by conspicuous demarcation in the field.

The curves stipulated in construction drawings shall be carefully laid in the field by adopting approved method of curve layout. The curves shall be marked on the ground by fixing pegs at very closer intervals and joining the peg points by dug-belling to a suitable depth.

The locations of different structures indicated in construction drawing shall also be clearly marked on the ground along the alignment of the canal. The control structure locations of off-taking canals shall also be clearly demarcated, so that unnecessary excavation or filling at these locations can be avoided.

The spoils dumping zones shall clearly be demarcated in the field. These zones should be at least 2 m beyond the location of catch water drains.

2.2.6 To ensure accuracy in execution of cutting, the canal embankment, spoil banks and the structures, their layout shall be given in an appropriate manner with pegs and pillars suitably placed in relation to outer dimensions of these elements.

2.2.7 All materials and labour for setting out works including construction of reference bench marks, reference lines, check profiles and surveys as may be required at the various stages of construction, shall be made by the contractor at his own cost. The cost of such works shall be deemed to have been included in the cost of items in schedule.

2.3 CLEARING AND GRUBBING

2.3.1 CLEARING AND LEVELING SITE.

The portion of the right-of-way where required for constructing the work under these specifications shall be cleared of all trees, bushes, rubbish and other objectionable materials. Trees designated by the Engineer-in-charge shall not be cut and shall be protected from injury. Such cleared materials shall be disposed-off as provided in the sub-paragraph 3.2.3 below or removed from the site of work before the date of completion of the contract as approved by the Engineer-in-charge. The clearing operation shall be in accordance with clauses 4.1., 4.1.1., 4.2 and 4.3 of IS: 4701-1982 Indian code of Practice for earth work in canals. Surface boulders, either loose or partly embedded in the ground will have to be removed and stacked as directed.

2.3.2 GRUBBING.

The area described or shown on the relevant site plan shall be cleared of all obstructions, loose stones, non required materials and rubbish of all kinds. All brushwood shall be cleared and the roots grubbed up. **Trees to be preserved will be designated by the Engineer-in-charge.** No trees shall be cut down and removed

without the instructions of the Engineer-in-charge. Those which are cut down shall be grubbed up. The same remarks apply to jungle clearance.

The products of the clearing shall be stacked in such place and manner as may be ordered by the Engineer-in-charge and the ground shall be left in a perfectly clean condition. All products of the clearing shall be the property of Govt. and shall be disposed- off as per the direction of the Engineer-in-charge.

All holes or hollows, whether originally existing or produced by digging up roots shall be carefully filled up with earth, well rammed to the design density and levelled off as directed.

2.3.3 PREPARATION OF BED

Ant-hills shall be completely dug out before earth work is started. Loose stones and digging of ant-hills involved in the preparation of bed. The contract rate for the earth work shall be deemed to include all the work to be done in accordance with this clause. In cases where the work of preparation of bed is rather extensive, the Engineer-in-charge will usually provide a separate schedule item of such preparation, but in the absence of such schedule provision, the contractor shall understand that his tender rate is inclusive of all such work without extra charge.

The contractor shall therefore examine the site before tendering and provide for all items to be done under this earth work tender rate. Old bunds will be benched or sloped as directed by Engineer-in-charge before addition of earth. The benches shall be 450 mm x 450 mm unless other sizes are specified (Refer page-35/Chapter-2 of Technical Manual, OCTDMS). The benches or slope shall be inspected by the Engineer-in-charge or engineer designated for the purpose and approved before new earth work is keyed into them.

2.3.4 DISPOSAL OF CLEARED AND GRUBBED MATERIAL

The disposal of cleared and grubbed materials shall be in accordance with clause 4.1.1 of IS 4701-1982 code of practice for earth work on canals. All waste materials to be burnt shall be piled neatly and when in suitable condition shall be burnt completely to ashes. Piling of waste material for burning shall be done at such a location and in such a manner as would not cause any fire risk in cleared area. Suitable materials and equipments for prevention and suppression of the fire shall be kept available at all times.

The materials to be disposed off shall be buried.

2.3.5 PAYMENT

For the clearance of light jungles, heavy jungle with or without up-rooting etc., payment will be made as provided for in the bill of quantities. Separate payment will not be made for clearing of site and grubbing including disposal of the cleared and grubbed materials required under the above paragraphs as specified in the contract document. The contractor shall include the cost thereof in the price bid in the bill of quantities of the contract for the relevant finished item of work for which clearing and grubbing as mentioned in the above para are required. No payment towards removal of small stones and boulders of size less than 0.5 cubic meters will be made, and the rate quoted for excavation will be considered to include this item. However, payment will be made for the removal of surface boulders of sizes greater than 0.5 cubic meter, either loose or partly embedded in the ground, at the rate quoted in bill of quantities for the actual quantity so removed based on stack measurement applicable for the relevant strata classification after deducting 40% towards voids.

Benching will be paid as separate item, per cubic meter of excavation of bench at the rate provided for in the tender documents.

2.4 USE OF WATER

2.4.1 WATER FOR DUST ABATEMENT

The contractor shall procure and apply water for dust abatement.

Water applied for dust abatement will not be eligible for payment. The cost of procuring and applying water including all expenses for all means of conveying water to the point of use, their collection, usage, and all other incidental expenses will not be paid separately including creation of source of water and the cost shall be deemed to have been included in the concerned unit price bid in the bill of quantities of the contract for the relevant finished item of work for which water for dust abatement is required.

So also the cost of procuring and applying water required for the works shall be included in the price bid in the bills of quantities for the items of work for which the water is used.

2.4.2 PREWETTING OF CANAL PRISM AND ADJACENT AREAS

The contractor shall furnish all labour, materials and equipment and shall procure and apply water required for pre-wetting the areas under canal and embankment.

Water applied for pre-wetting areas as detailed above will not be eligible for payment. The cost of procuring and applying water including all expenses for all means of conveying the water to the point of use, their collection, usage and all incidental charges shall be included by the contractor in the concerned unit price

bid in the bill of quantities for that item of work where the water shall be used and no separate payment for the same will be made.

2.5 SITE DRAINAGE

2.5.1 CROSS DRAINAGE

The contractor shall handle all flows from natural drainage channel intercepted by the work under these specifications, 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. 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-in-charge.

In addition to cross drains, longitudinal drains may be considered necessary for proper drainage. The drainage system consisting of network of cross and longitudinal drainage system will be led into out-fall drains to prevent stagnation of water at the place of construction. The drains shall be constructed to the section designed and shall be either open or filled up with material to ensure free flow of water without clogging of the filled materials.

The cost of all works and materials required by this paragraph shall be included by the contractor in the unit prices quoted in the bill of quantities and no separate payment will be made for the same.

2.5.2 DRAINS

In connection with excavation for the canal and structures, the contractor shall perform excavation for the construction of drains, beam drains and chutes and any other drains as directed by the Engineer-in-charge.

The location, grades and sections of the drains shall be as shown on the drawings and or as directed. Measurement of excavation for the above drains will be made to the lines shown in the drawings or as directed. Payment for excavation for the above drains, channels and embankment will be made at the unit price bid in the bill of quantities for execution of canal, which unit price shall include the cost of placing the materials in embankment or otherwise disposing of the excavated materials and all work necessary to maintain the work in good order during construction.

2.5.3 BERM DRAINAGE AND DOWEL BANKS

Berm drainage, including drainage along the berm and banks of the canal and longitudinal berm drains shall be constructed where shown to dimensions and grades on the drawings or as directed.

The surface of the berm shall be sloped transversely and dowel banks shall be made along with sides of the banks and berm where shown on the drawings and elsewhere where directed. The dowel banks may be made by balding of material in place, following completion of a canal reach.

No direct payment will be made for constructing Dowel banks and sloping berms and cost thereof shall be included in the unit price per cubic meter bid in the bill of quantities for construction for canal embankment including reconstructing and remodelling.

2.6 MONSOON DAMAGES

Damages due to rain or flood either in cutting or in banks shall have to be made good by the Contractor till the work is handed over to the department. The responsibility for de-silting and making good the damages due to rain or flood rests with the contractor. No extra cost is payable for such operations and the contractor shall therefore, had to take all necessary precautions to protect the work done during the construction period.

2.7 REMOVAL OF SILT AND WATER

Accumulated silt and water in the canal and structures for the works partly done by the contractor in current or previous seasons should be removed and no extra payment will be made, for such removal of silt and water. This unit rate of excavation is deemed to include cost of removal of such silt and water.

2.8 PROCEDURES FOR MEASUREMENT

Before commencement of work, initial levels to indicate existing ground levels, shall be taken at 30 m intervals longitudinally along the alignment of the canal. The level points transversely along the cross sections shall be at the maximum of 5 m intervals in flat ground and 3 m in undulating terrain. The cross sections shall be extended beyond the limit of work to a suitable distance and minimum 5 m beyond the toe lines of slopes on both the sides. The interval stipulated shall be made closer depending on the topography or any stipulation made by the Engineer-in-charge.

All initial levels shall be recorded in ink in authenticated level books issued by the Engineer-in-charge and shall be signed by the Junior Engineer/ Assistant Engineer when he records the levels. The Assistant Engineers and Executive Engineers shall exercise checks strictly in accordance with the codal provisions.

Actual construction works shall not be allowed to start unless the above formalities are fulfilled. If the work is awarded to any agency, the level shall be recorded in the presence of the contractor or his authorized agent. The contractor or his authorized agent shall sign each page of the level book/ field book in token of acceptance. These cross sections shall form the basis of all future measurements and payments. Each dimension shall be measured to the nearest 0.01m, areas shall be computed to nearest 0.01sqm. Volume shall be computed to nearest 0.01 cubic m.

SECTION - 3 CONCRETE WORKS

4.0 CONCRETE STRUCTURES

Concrete in structures shall conform to the requirements of paragraphs 4.1.1.

4.1 CONSTRUCTION OF STRUCTURES

The item of the schedule for concrete in the structures includes all cast-in-place concrete in the structure. Concrete to be Cast-in-place for all the structures shall conform to the requirement of section 4.2 below. Pipe and fitting of miscellaneous metalwork, mechanical and electrical equipment and other items forming a part of the structures are provided for elsewhere in these specifications.

The structures shall be built to the lines, grades, and dimensions shown on the drawings. The dimensions of each structure as shown on the drawings will be subject to such modifications as may be found necessary by the Engineer-in-charge to adapt the structure to the conditions disclosed by the excavation or to meet other condition. Where the thickness of any portion of a concrete structure is variable, it shall vary uniformly between the dimensions shown.

Where necessary, the contractor shall be furnished with additional detail drawings of the structures to be constructed as determined by the Engineer-in-charge. The contractor will not be entitled to any additional allowances above the price bid in the bill of quantities by reason of the dimensions fixed by the Engineer-in-charge or by reasons of any modifications or extension of a minor character to adopt a structure at site.

The cost of furnishing of all materials and performing all work for installing timber, metal and other accessories for which specific price are not provided in the schedule, shall be included in the applicable prices bid in the schedule for the work to which such items are appurtenant.

4.2 GENERAL CONCRETE REQUIREMENTS

4.2.1 COMPOSITION

Concrete shall be composed of cement, sand, coarse aggregate, water, admixtures (if any) as specified and all will be mixed in batching plant by weight or by concrete mixers by volume and brought to the proper consistency. Batching plant shall conform to IS: Code 4925-1968.

For works in which water tightness is required the specification in IS: 3370-1965 Para 1 to 10 shall be adopted.

4.2.1.1 MIXING:

Concrete shall be mixed in a mechanical mixer and shall be as dense as possible, plastic enough to consolidate, well and stiff enough to stay in place on the slopes.

Mixing shall be continued until there is a uniform mixing of the materials and the concrete is uniform in colour and consistency. The time of mixing shall be as shown in table-1 of IS 457-1957 reproduced below.

Capacity of Mixer	Minimum time for Mixing	
	Natural Aggregates	Manufactured Aggregates.
All mixers	2 minutes	2-1/2 minutes.

4.2.1.2 NOMINAL MAXIMUM SIZE OF AGGREGATES:

Sizes of aggregates shall conform to IS: 383-1970. The coarse aggregates to be used in concrete shall be as large as practicable, consistent with required strength, spacing of reinforcement and embedded items and placement thickness. The size of the coarse aggregates to be used will be determined by the Engineer-in-charge and may vary incrementally according to the conditions encountered in each concrete placement. Nominal maximum size of aggregates for concrete in structures and canal lining shall be as indicated in the relevant drawings appended to the contract documents. When proper placement of concrete is impracticable with the size of the aggregate specified in the drawings, smaller coarse aggregates than specified shall be used as per the opinion of the Engineer-in-charge.

4.2.1.3 MIX PROPORTIONS:

The proportions of various ingredients to be used in the concrete for different items of the work are given in the bill of quantities. In proportioning concrete, the quantity of both cement and aggregate should be determined by volume. Water shall be either measured by volume in calibrated tanks or weighed. Batching plant shall conform to IS: 4925-1968 (Indian Standard Specification for batching and mixing plant). All measuring equipments shall be maintained in a clean serviceable condition and their accuracy periodically checked. Adjustment shall be made as directed to obtain concrete having suitable workability, impermeability, density, strength and durability without the use of excessive cement. The acceptance or rejection of concrete shall be as per the acceptance criteria laid down in clause-16 of IS: 456-2000.

The water cement ratio exclusive of water absorbed by the aggregate shall be sufficiently low to provide adequate durability in concrete. The water cement ratio of various grades of concrete shall be as determined and ordered by the Engineer-in-charge. Admixture of Pozzolana, if ordered, shall conform to the requirements specified in IS: 9103-1979 (Indian Standard Specification for Admixtures for concrete).

4.2.1.4 CONSISTENCIES:

The slump of concrete at the placement shall be as follows:

Sl. No.	Place condition	Degree of workability	Value of workability.
1.	Concreting of light reinforced sections without vibration or heavily reinforced section with vibrations.	Medium	25mm to 75mm slump for 20 mm aggregate.
2.	Plain concrete work	-do-	-do-
3.	Lining with slip form machine for concrete paver finish	-do-	60 to 70 mm slump

If the specified slump is exceeded at the placement, the concrete is unacceptable. The Engineer-in-charge reserves the right to require lesser slump whenever concrete of such lesser slump can be consolidated readily into place by means of vibration specified by the Engineer-in-charge. The use of equipment, which will not readily handle and place concrete of the specified slump will not be permitted.

To maintain concrete at proper consistency, the amount of water and sand batched for concrete shall be adjusted to compensate for any variation in the moisture content or grading of the aggregates as they enter the mixer. Addition of water to compensate for stiffening of the concrete after mixing and before placing will not be permitted. Uniformity in concrete consistency from batch to batch will be required.

4.2.2 CONCRETE QUALITY CONTROL MEASURES AND QUALITY ASSURANCE TESTS

4.2.2.1 CONCRETE QUALITY CONTROL MEASURES

- The contractor shall be responsible for providing quality concrete to ensure compliance of the contract requirements.
- Making and cutting concrete test specimens in the field will conform to IS 516-1959
- Capping cylindrical concrete specimens will conform to IS 516-1959
- Compressive strength of concrete specimens will conform to IS 516-1959.

4.2.2.2 SAMPLING PROCEDURE AND FREQUENCY

- A random sampling procedure shall be adopted to ensure that each concrete batch has a reasonable chance of being tested i.e. the sampling should be spread over the entire period of concreting and should cover all mixing units.
- FREQUENCY :** The frequency of sampling of concrete of each grade shall be in accordance with the following-

Quantity of concrete in cum	Number of samples.
1 to 5	1
6 to 15	2
16 to 30	3
31 to 50	4

Note: At least one sample shall be taken during each shift.

4.2.2.3 TEST FACILITIES

The contractor should supply in free of cost, the samples of all the ingredients of concrete used in the work for the test to be conducted by the Engineer-in-charge or any officer nominated by him.

4.2.2.4 CONTRACTOR TO FURNISH DRAWINGS AND DATA

Not less than 30 days prior to start of installation of the contractor's plant and equipment for processing, handling, transporting, storing and proportioning concrete, the contractor shall submit its drawings and data to the Engineer-in-charge for approval, showing the arrangement of plant etc. The drawing and data shall provide a description in sufficient details for an adequate review of the facilities and equipment the contractor proposes to provide at site of work.

4.2.3 CEMENT

4.2.3.1 GENERAL

Cement shall conform to clause 5.1 to 5.1.3 of IS 456-2000 for the purpose of specifications. Cement used shall be any of the following with the prior approval of the Engineer-in-charge.

- a. 33 grade Ordinary or low heat Portland cement conforming to IS: 269-1989
- b. Rapid hardening Portland cement conforming to IS: 8041-1990
- c. Portland slag cement conforming to IS: 455-1989
- d. Portland Pozzolana cement conforming to IS: 1489-1991
- e. 43 grade ordinary Portland cement conforming to IS: 8112-1989
- f. Hydrophobic cement conforming to IS: 8043-1991
- g. 53 grade Ordinary Portland cement conforming to IS: 12269-1987

The provisions of this paragraph apply to cement for use in cast in place concrete required under these specifications. Portland cement required for items such as concrete pipes, pre-cast concrete structural members and other pre-cast concrete products for grout and mortar and for other items provided for, under appropriate paragraph of these specifications covering items for which such Portland cement is required.

The contractor shall make his own arrangements for the procurement of cement to required specifications required for the work. Transportation from the place of supply to the batching plant shall be in weather-tight rail cars, trucks, conveyors and other means, which will protect the cement completely from exposure to moisture. Immediately upon receipt at the jobsite, bulk cement shall be stored in dry, weather tight, properly ventilated bins until the cement is batched. The bins shall be emptied and cleaned by the contractor when so directed by the Engineer-in-charge. However, the intervals between required cleaning will normally be not less than 6 months. Each shipment of bagged cement shall be stored separately so that it may readily be distinguished from other shipment and shall be stored in a dry enclosed area protected from moisture. Storage of materials shall be as described in IS: 4082-1996 (IS recommendation on staking and storage of construction materials at site). To prevent under-aging of bagged cement after delivery, the contractor shall use bags of cement in the chronological order in which they were delivered to the job site. All storage facilities shall be subject to approval of the Engineer-in-charge.

4.2.3.2 ACCEPTANCE OF CEMENT.

Cement shall be supplied by the contractor according to clause 10.1 of IS: 269-1989.

4.2.3.3 ACCEPTANCE OF POZZOLANA:

Pozzolana added to the concrete as an admixture shall be sampled and tested as per IS: 9103-1999.

4.2.3.4 RECOVERY OF COST OF CEMENT IN WASTED CONCRETE ETC:

The cost of cement used in wasted concrete in replacement of damaged or defective concrete and extra concrete required because of over excavation and in concrete placed by the contractor in excavations intentionally performed to facilitate the contractor's operation shall be borne by the contractor himself. No extra payment shall be made to the contractor for such additional quantity.

4.2.4 ADMIXTURES

The contractor shall use air-entraining admixtures as directed by the Engineer-in-charge. Admixtures shall be of uniform consistency and quality and shall be maintained at the job site at uniform strength of solution. Admixtures shall be batched separately in liquid form in containers capable of measuring at one time the full quantity of each admixture required for each batch. Chemical admixtures, which harm the quality and strength of concrete, shall not be used in the concrete.

4.2.5 WATER

The water used in making and curing of concrete mortar and grout shall be free from objectionable quantities of silt, organic matter, injurious amounts of oils, acids, salts and other impurities etc. as per IS specification 456-2000.

The Engineer-in-charge will determine whether such quantities of impurities are objectionable. Such determination will unusually be made by comparison of compressive strength, water requirement, time of set and other properties of concrete made with distilled or very clean water and concrete made with the water proposed for use. Permissible limits for solids when tested in accordance with IS: 3025-1964 shall be as tabulated below:

4.2.5.1 PERMISSIBLE LIMITS FOR SOLIDS IN WATER

1. Organic solids :Maximum permissible limit 200 mg/l.
2. Inorganic solids :300 mg/l.
3. Sulphate (as SO₄) :500 mg/l.
4. Chlorides (as Cl) :2000 mg/l for plain concrete work and 1000 mg/l for RCC work.
5. Suspended matter :2000 mg/l.

The pH value of water shall generally be not less than 6 (six).

If any water to be used in concrete mortar or grout is suspected by the Engineer-in-charge of exceeding the permissible limits for solids, samples of water shall be obtained and tested by the Engineer-in-charge in accordance with IS: 3025-1964.

4.2.6 SAND (FINE AGGREGATE)

4.2.6.1 GENERAL

The term sand is used to designate aggregate most of which passes 4.75 mm IS Sieve and contains only so much coarser material as permitted in clause 4.3 of IS: 383-1970. Sand shall be predominantly natural which may be supplemented with crushed sand to make up deficiencies in the natural sand grading.

All sand shall be procured by the contractor from approved sources. Sand as delivered to the batching plant shall have uniform and stable moisture content. Determination of moisture content shall be made as frequently as possible; the frequency for a given job being determined by the Engineer-in-charge according to weather conditions following IS: 456-2000.

4.2.6.2 QUALITY:

The sand shall be clean, dense, durable, uncoated rock fragments as per IS: 383-1979. Sand may be rejected if it fails to meet any of the following quality requirements:

FINENESS: The fineness modulus of sand shall be between 2.20 to 3.20.

ORGANIC IMPURITIES IN SAND:

Colour, no darker than the specified standard in clause 6.2.2. of IS: 2386 Part II 1963 (Indian Standard method of test for aggregates of concrete Part II estimation of deleterious materials and organic impurities)

Sand shall be screened before use. If sand brought to site is not clean, it must be washed clean in water. Fine draft sand or sea sand or sand containing saline impurities shall on no account be used.

SODIUM SULPHATE TESTS FOR SOUNDNESS:

The sand to be used shall pass Sodium or Magnesium Sulphate accelerated test as specified in IS: 2386(Part-V) 1963 for limiting loss on weight.

SPECIFIC GRAVITY:

The sand to be used shall have minimum specific gravity of 2.4

DELETERIOUS SUBSTANCE:

The amount of deleterious substances in sand shall not exceed maximum permissible limits prescribed in table-1, clause 3.2.1 of IS: 383-1970 (Indian Standard Specification for coarse and fine aggregates from natural

source for concrete) when tested in accordance with IS: 2386-1963.

4.2.6.3 GRADING

The sand as batched shall be well graded and when tested by means of standard sieves, shall conform to the limits given in table-4 of IS: 383-1970 and shall be described as fine aggregates, Grading zones, I, II, III and IV. Sand complying with the requirements of any of the four grading zones is suitable for concrete. However, sand conforming to the requirements of grading zone IV shall not be used for **reinforced cement concrete** work.

Sieve analysis of natural sand shall conform to the following limits of gradation.

I.S. Sieve size	Percentage of passing on Sieve		
	Grading Zone-I	Grading Zone-II	Grading Zone-III
4.75 mm	90-100	90-100	90-100
2.36 mm	60-95	75-100	85-100
1.18 mm	30-70	55-90	75-100
600 micron	15-34	35-59	60-79
300 micron	5-20	8-30	12-40
150 micron	0-10	0-10	0-10

It is recommended that the sand conforming to grading zone-I to III is suitable for use.

4.2.7 COARSE AGGREGATES:

4.2.7.1 GENERAL

For the purposes of these specifications, the term "Coarse Aggregate" designate clean well graded aggregates, most of which is retained on 4.75 mm. I.S: Sieve and containing only so much finer materials as permitted for various types described under clause 2.2. of IS: 383-1970. Coarse Aggregate for concrete shall consist of uncrushed stone, or crushed stone and partially uncrushed and crushed stone.

Coarse Aggregates for concrete shall be procured by the Contractor from the approved quarries. The contractor shall, unless otherwise specified in the tender notice and subsequently on this basis in the contract, be responsible for payment of seignorages, quarry fees etc. on all materials.

Coarse aggregates as delivered to the batching plant shall generally have uniform and stable moisture content. In case of variations, clause 9.2.3 of IS 456-2000 shall govern during batching.

4.2.7.2 QUALITY

The coarse aggregate shall consist of naturally occurring (crushed or uncrushed) stones, and shall be hard, strong, durable, clear and free from veins and adherent coating, and free from injurious amounts of disintegrated pieces, alkali, vegetable matter and other deleterious materials. Coarse aggregate not conforming to any of the following requirements, shall be rejected.

LOS ANGELES ABRASION TEST

The abrasion value of aggregates when tested in accordance with the method specified in IS: 2386 (Part IV)-1963 using Los Angles machine, shall not exceed 30% for aggregates to be used in concrete for wearing surface and 50% for aggregates to be used in other concrete.

AGGREGATE CRUSHING STRENGTH TEST

Aggregates crushing value, when determined in accordance with IS: 2386 (Part IV)-1963 shall not exceed 45% for aggregates used for concrete other than wearing surface and 30% for wearing surfaces. As an alternative to the crushing strength test of aggregates, impact value shall be found out with the method specified in IS: 2386 (Part IV)-1963. The aggregates impact value shall not exceed 45% by weight for aggregates used for concrete for other than wearing surfaces and 30% by weight for concrete for wearing surface such as runways roads and pavements.

SOUNDNESS TEST

The coarse aggregates to be used for all concrete works shall pass a Sodium or Magnesium Sulphate accelerated soundness test specified in IS: 2386 (Part V)-1963 and the average loss of weight after 5-cycles shall not exceed the limits specified in clause 3.6 of IS: 383-1970.

SPECIFIC GRAVITY

The coarse aggregates shall have specific gravity of 2.60 minimum.

DELETORIOUS MATERIALS

The maximum quantity of deleterious materials in coarse aggregates shall not exceed the limits specified in Table of I.S: 383-1970 when tested in accordance with IS: 2386-1963.

4.2.7.3 SEPARATION

The coarse aggregates shall be separated into nominal sizes during production of the aggregates. Just prior to batching, the coarse aggregates shall be re-washed by pressure spray and finish screened on multi-desk vibrating screen capable of simultaneously removing undersized and over sized aggregate from each of the nominal aggregate. Aggregates entering the batches occur during intermittent batching then a dewatering screen will be required after the finish screens to remove the excess free moisture. Finish screens shall be mounted over the batching plant or on the ground adjacent to the batching plant. Finish screens shall be so mounted that, the vibration of the screen will not be transmitted to the batching bins or scales and will not affect the accuracy of the weighing equipment in any other manner.

The method and rate of feed for finish screening shall be such that, the screens are not over-loaded and result in a finished product, which meets the grading requirements of these specifications. Coarse aggregate shall be fed to the finish screens in a combination of alternations of nominal sizes, which will not cause noticeable accumulation of poorly graded coarse aggregates in any bin. The finish-screened aggregates shall pass directly to the individual batching bin in such a manner as to minimize breakage. Below 2.36 mm. materials passing through the finish screens shall be wasted unless it is routed back through a sand classifier in a manner, which causes uniform blending with the natural sand being processed. Water from finish screening shall be drained in such a manner as to prevent aggregate wash water from entering the batching bins and weighing hoppers washing and finish screening requirements shall be subject to approval by the Engineer-in-charge.

Coarse aggregates for concrete shall be separated into various nominal maximum sizes specified in the relevant paragraph. Separation of the coarse aggregate into the specified sizes after finish screening shall conform to the grading requirements specified in Table-2 of IS 383-1970 when tested in accordance with IS: 2386 (Part II)-1963 (Method of test for aggregates for concrete part I) particles size and shape.

Coarse aggregate for mass concrete may be separated as previously herein specified. Separation of the coarse aggregates into the various sizes shall be such that when tested in accordance with IS 2386 (Part I) 1963 shall conform to the requirements specified in Table 3 of IS 383 – 1970.

Sieves used in grading tests shall be standard mesh sieves conforming to IS 460 (Part I) 1978 (specification for test sieves part I wire cloth test sieves)

4.2.8 PRODUCTION OF SAND AND COARSE AGGREGATE

4.2.8.1 GENERAL

Sand and coarse aggregate for concrete and sand for mortar and grout shall be obtained by the contractor from the approved sources. The approval of deposits by the Engineer-in-charge shall not be construed as consisting of the approval of all or any specified materials taken from the deposits and the contractor will be responsible for the specified quality for all such materials used in the work.

Tests performed on samples of sand and coarse aggregate obtained from the approved sources mentioned in the contract documents indicates that they are generally suitable. Well in advance of their usage on the works, the contractor shall have his own testing of materials and satisfy himself that they conform to the specification mentioned here in for use in the works.

No separate payment will be made for such tests. If sand and coarse aggregate are to be obtained from a deposit not previously tested and approved by the Engineer-in-charge, the contractor shall submit representative samples for pre-construction test and approval not less than 60 days before the sand and coarse aggregates are required for use. Each sample shall approximately consist of 100 Kg. of material. In addition to pre-construction tests for the approval of deposits, the Engineer-in-charge may test the aggregates for their suitability during their processing. The contractor shall provide such facilities as may be necessary for procuring representative samples free of cost at the aggregate processing plant and at the batch plant or mixing platform.

However, use and development of any such deposit shall be subject to the approval by the Engineer-in-charge. Any royalties (seigniorages or other charges) required for the materials taken from deposits either owned by the State Government or controlled by the Department of Mines and Geology, Govt. of India or owned by any other person shall be paid by the contractor.

4.2.8.2 DEVELOPING AGGREGATE DEPOSITS

If the deposit is owned by the State Govt. and controlled by the department of Mines and Geology, the portion of the deposit used shall be located and operated so as not to detract the usefulness of the deposit or any other property of the Government and so as to preserve, in so far as practicable, the future usefulness or value of the deposit. The contractor shall carefully clear the area of deposit from which the aggregates are to be produced, free from trees, roots, bushes, sods, solid unsuitable sand, gravel and other objectionable matter. Materials including stripping, removed from deposits owned by the Government, controlled by the Director of Mines and Geology, Government of India, and not used in the work covered by these specifications shall be disposed-off as directed.

Due to the overall construction programme, it is quite likely that more than one contractor may elect to use of the sources named in the contract document. The contractor shall be responsible for coordinating his work such that it does not interfere with the operations of other contractors who are also using any given source.

4.2.8.3 PROCESSING RAW MATERIALS

Processing of the raw materials shall include screening and washing as necessary to produce sand and coarse aggregate conforming to the requirements of paragraph 4.2.6 and 4.2.7. Processing of aggregate produced from any source owned by the State Government and controlled by the Department of Mines and Geology shall be done at an approved site. Water used for washing aggregate shall be free from objectionable quantities of salts, organic matter and other impurities. Oversize metal may be crushed to correct aggregate particle size and excess material in individual coarse aggregate size fractions may be crushed to give the largest practical yield of usable concrete aggregate.

Suitable types of crushers shall be used with the prior approval of the Engineer-in-charge for producing coarse aggregates. Crusher fines produced in the manufacture of coarse aggregates may be used in sand. Crushed stone, sand, crushed gravels and crusher fines if used shall be predominantly cubical in shape and shall be blended uniformly with natural sand by routing them together through sand classifier. Crusher coarse aggregate shall be blended uniformly with natural coarse aggregate by routing both together through the classifying screens.

In the process of developing and producing aggregates from approved sources for work under these specifications, **the provisions of environmental quality protection shall apply.**

4.2.8.4 COST

This shall be included in the applicable price bid in the schedule for concrete, filter and other works in which the aggregates are used of which prices shall include the cost for stripping, producing and transporting & storing the materials. The contractor shall not be entitled to any additional compensation for materials wasted from a deposit including crushed fines and materials, which have been discarded by the reasons of being above the maximum size specified for use or for any other reasons.

4.2.9 BATCHING

The contractor shall notify the Engineer-in-charge 24 hours before batching of concrete. Unless inspection is waived in each case, batching shall be performed only in the presence of an Engineer authorized by Engineer-in-charge.

The contractor shall provide, maintain, and operate the equipment as required to accurately determine and control the prescribed amounts of the various materials entering the concrete mixtures. The quantities of cement, sand and each size of coarse aggregate entering each batch of concrete shall be determined by individual volume measurement or by weight as the case may be. Cement has to be weighed/ measured in volume separately from the aggregates. Sand and coarse aggregates may be weighed with separate scale and hoppers.

The grading of aggregates shall be controlled by obtaining the coarse aggregate in different sizes and blending them in the right proportions, the different sizes being stacked in separate stock piles, the materials shall be stock piled a day before use. The grading of coarse and fine aggregates will be checked as frequently as directed by the Engineer-in-charge. Water shall be added by weight or measured by volume in calibrated tanks. The amount of added water shall be adjusted to compensate for any observed variations in the moisture contents. Determinations of moisture content in the aggregate shall be in accordance with IS: 2386 (Part III) 1963 (Indian Standard Method of test for aggregate of concrete Part III). The amount of surface water carried by aggregates will be determined in accordance with Table-5 of IS: 456-2000.

Cement and aggregates are hauled from a central batching plant to the mixer. Each batch shall be protected during transit to prevent loss and to limit the pre-hydration of cement. Separate compartments with suitable covers shall be provided to protect the cements or they shall be completely enfolded in and covered by the aggregates to prevent wind loss. If cement are enfolded in moist aggregates or otherwise exposed to

moisture and delay occurs between batching and the mixing, then extra cement shall be added to each batch. The extent of such extra cement will be to attain the required quality. **No separate payment** for this addition of extra cement shall be made.

4.2.10 MIXING

4.2.10.1 GENERAL

The concrete ingredients shall be thoroughly mixed in mechanical mixers designed to positively ensure uniform distribution of all the component materials throughout the concrete at the end of the mixing period. Mixing shall be done as per clause-9 of IS: 456-2000. The mixer should comply with IS: 1971-1985 (IS Specifications for batch type concrete mixers)

The concrete as discharged from the mixer shall be uniform in composition and consistency from batch to batch. Workability shall be checked at frequent intervals as per IS: 1199-1959. Mixer shall be examined regularly by the Engineer-in-charge or his authorized Engineer for changes in conditions due to accumulation of hardened concrete or mortar or to wear of blades. The mixing shall be continued until there is a uniform in colour and consistency and to the satisfaction of the Engineer-in-charge. If there is, aggregation after unloading, the concrete should then be remixed.

Any mixer that at any time produces unsatisfactory mix shall not be used until repaired. If repair attempts are unsuccessful, a defective mixer shall be replaced. Batch capacity shall be at least 10% of but not in excess of the rate capacity of the mixer unless otherwise authorized by the Engineer-in-charge.

4.2.10.2 CENTRAL MIXERS

Water shall be admitted prior to and during charging of the mixer with all other concrete ingredients. After all materials are in the mixer, each batch shall be mixed for not less than the time

specified by the Engineer-in-charge. The minimum mixing time shall be 2 minutes. The minimum mixing time specified is based on average mixer performance. The Engineer-in-charge will adjust the minimum mixing time as required by the observations of the mix delivered from mixer. Excessive over mixing which require addition of water to maintain the required concrete consistency shall not be permitted.

In addition to IS: 1791-1985, the mixing equipment shall conform to the following further requirements.

1. Plant configuration shall be such that the mixing of each mixer can be observed from the safe location, which can be easily reached from the control station. Provisions shall be made so that the operator can observe the concrete in the receiving hopper or bucket as it is being dumped from the mixers.
2. Each mixer shall be controlled with timing device, which will indicate the mixing period and assure compliance of required period of mixing.
3. The batch plant shall be equipped with an interlocking mechanism, which will prevent concrete batches from entering mixers, which are not empty.

4.2.10.3 TRUCK MIXERS

Each truck mixer shall be equipped with accurate water meter located between the supply tank and mixers with a dial or digital indicator and a reliable revolution counter, located near the water meter, which can be readily reset to Zero for indicating the total number of revolutions of the drum for each batch. Each mixer shall have affixed there to a metal plate on which the drum operations in terms of volume for both mixing and agitating and the maximum and minimum speeds of rotation of the drum are mainly marked.

Mixing shall be continued for the minimum period specified and may be increased and number of revolutions, speed of the drum may be such that the mixture as delivered from the mixer has uniform colour and consistency to the satisfaction of Engineer-in-charge. In no case shall the design water content be exceeded.

Concrete shall be discharged within half an hour after the introduction of the water and cement into the mixer. Each batch of concrete when delivered at the job site from commercial ready mix plants shall be accompanied by a written certificate of batch weights and time of batching.

4.2.11 TEMPERATURE OF CONCRETE

Fresh structural concrete and fresh canal lining concrete shall be placed at temperature of 15⁰ C to 30⁰ C. During hot or cold weather the concreting should be done as per the procedure set in IS: 7861 (Part I) 1975 or IS: 7861 (Part II).

The temperature will be determined by placing a thermometer in the concrete immediately after sampling at the site of placement. The temperature of concrete at the batch plant shall be adjusted to assure that the specified concrete temperature is attained at the placement.

In case of concrete in hot weather condition, the contractor shall employ effective means such as pre-cooling of aggregates and mixing water and placing at nights as necessary to maintain the temperature of the concrete as it is placed at the specified limit. The methods of pre-cooling shall be subject to approval by the Engineer-in-charge.

Then contractor shall not be entitled for any additional compensation due to the foregoing requirements.

4.2.12 FORMS

4.2.12.1 GENERAL

Form shall be used wherever necessary to confine the concrete and shaping it to the required lines. If a type of form does not consistently perform in an acceptable manner as determined by the Engineer-in-charge, the type of form shall be changed and method of erection shall be modified by the contractor subject to approval of the Engineer-in-charge.

Plumb and string lines shall be installed before and maintained during concrete placement. Such lines shall be used by the contractor's personnel and by the Engineer-in-charge and shall be in sufficient number and properly installed as determined by the Engineer-in-charge. During concrete placement, the contractor shall continuously monitor plumb and string lines, form positions and immediately correct the deficiencies.

Forms shall have sufficient strength to withstand the pressure resulting from placement and

vibration of the concrete and shall be maintained rigidly in position. Where form vibrators are to be used, forms shall be sufficiently rigid to effectively transmit energy from the form vibrators to the concrete while not damaging or altering the positions of forms. Forms shall be sufficiently tight to prevent loss of mortar from the concrete. Chamfer strips shall be placed to produce bevelled edges on permanently exposed concrete surfaces. Interior angle intersecting concrete surfaces and edges of construction joints shall not be bevelled except where indicated on the drawings.

Suitable struts, stiffeners, or ties shall be used for the formwork wherever necessary. All supports shall be braced and cross-braced into two directions. All splices and braces shall be secured by bolting unless specially intended otherwise. All struts shall be firmly supported against settlement and slipping, by suitable means as directed. All supports shall be cut square at both ends and firmly supported against settlement and slipping. When the formwork is supported on soil, sleepers etc. shall be used to properly disperse the loads. In case the supports rest on already completed beam or slab suitable props shall be provided under the latter.

The formwork shall be of well-seasoned timber or steel. When timber forms are used, they shall be lined with MS sheet or other suitable smooth faced non-absorbent materials as specified. Supports may be of timber or steel. Suitable wedges in pairs to facilitate adjustment and subsequent releasing of forms shall be provided preferably at the upper end of the supports. The details of the proposed formwork and supports shall be submitted to the Engineer-in-charge and shall be approved before erection.

In case of columns, retaining walls or deep vertical component, the height of the column shall facilitate the placement and compaction of concrete and suitable arrangement may be made for securing the forms to the already poured concrete for placing the subsequent lifts. No steel tie or wires used for securing this formwork shall be left exposed-off the face of the finished work.

Suitable inserts for block-outs for electrical and other service fixtures where necessary shall be provided in the required locations as specified. At the time the concrete is placed in forms, the surfaces of the forms shall be free from encrustations of mortar grout or other foreign material. Before concrete is placed, the surface of the forms shall be oiled with commercial forms of oil.

4.2.12.2 REMOVAL OF FORMS

The stripping of formwork shall conform to clause-11.3 of IS: 456-2000. The contractor shall be liable for damage and injury caused by removing forms before the concrete has gained sufficient strength. Forms on sloping faces of concrete, such as forms on the watersides of wrapped transitions shall be removed as soon as the concrete has attained sufficient stiffness to prevent sagging. Any needed repairs or treatment required on such slopping surfaces shall be performed at once and be followed immediately by permitted curing.

To avoid incessant appearance in concrete that might result from swelling of forms, wood forms for wall openings, shall be loosened as soon as the loosening can be accomplished without damages to the concrete. Forms for the opening shall be constructed as to facilitate such loosening. Forms shall be removed with care so as to avoid injury to concrete and any concrete so damaged shall be repaired in accordance with paragraph 6.2.21.

4.2.12.3 COST

The cost of furnishing all materials and performing all works for constructing forms including any necessary treatment or coating of forms is included in the price bid of item of form work provided in the bill of

quantities.

4.2.13 TOLERANCES FOR CONCRETE CONSTRUCTION

4.2.13.1 GENERAL

Tolerances are defined as allowable variations from specified lines, grades, and dimensions and as the allowable magnitude of the surface irregularities. Allowable variations from specified lines, grades and dimensions are listed as given under sub-paragraph 4.2.13.2 below.

The intent of this paragraph is to establish tolerances that are consistent with modern construction practice that is governed by the effect that, permissible variations may have upon a structure. The Govt. reserves the right to diminish the tolerances set forth therein if such tolerances impair the structural action, operational function or architectural appearance of a structure or position thereof.

Concrete shall be within all stated tolerances even though more than one tolerance may be

specified for a particular concrete structure, provided that the specified variation for one element of the structure shall not apply, when it will permit another element of the structure to exceed its alterable variation. Where tolerance is not specified for particular structure, tolerances shall be those specified for a similar work. As an exception to clause-2 of the general provisions, specific tolerance shown here in connection with any dimension shall govern. The contractor shall be responsible for finishing the concrete forms within the limit necessary to ensure that the completed work will be within the tolerance limit specified. The defective work where the tolerance limit is exceeded shall be remedied in accordance with the sub-paragraph 4.2.13.2 and 4.2.13.3 as below.

4.2.13.2 VARIATION FROM SPECIFIED LINES, GRADES AND DIMENSIONS

Hardened concrete structure shall be checked by the contractor and will be subject to such inspection and measurement as needed to determine that the structures are within the tolerance as specified below.

Variation is defined as the distance between the actual position of the structure or any element of the structure and the specified position in plan for the structure or the particular element. Plus or minus variations shown as indicated or permitted from actual position up or down and in or out from the specified position in plan. Variations not designated as plus or minus indicate the minimum deviation permitted between designated successive points on the completed element of construction.

Specified position in plan is defined as the lines, grade and dimensions described in those specifications or shown on the drawings or as otherwise prescribed by the Engineer-in-charge.

4.2.13.3 TOLERANCE FOR CANAL EXCAVATIONS

1. Departure from Established alignment :
 ± 20 mm to on straight sections.
 ± 50 mm on tangent sections.
 ± 100 mm on curves.
2. Departure from Established Grade : ± 20 mm

4.2.13.4 TOLERANCE FOR CANAL LINING

1. Departure from Established alignment :
 ± 20 mm to on straight sections.
 ± 50 mm on partial curves and tangents

4.2.13.5 TOLERANCE FOR CANAL STRUCTURES

1. Deviations from specified dimensions of cross section of columns, beams, piers and slabs : $(-)$ 6 mm to $(+)$ 12mm
2. Deviations from dimensions of footing :
 - a. Dimensions in plan : $(-)$ 12mm to $(+)$ 50 mm
 - b. Eccentricity : ± 0.02 times width of footing in the direction of deviation but not more than 50mm
 - c. Thickness : ± 0.05 times the specified thickness

Note: Tolerance applies to concrete dimensions only but not for positioning of vertical reinforcing bars or dowels.

4.2.13.6 CONCRETE SURFACE IRREGULARITIES

GENERAL

Bulges, depressions and offsets are defined as concrete surface irregularities. Concrete surface irregularities are classified as “abrupt” or “gradual” and are measured relative to the actual

concrete surface.

ABRUPT SURFACE IRREGULARITIES

Abrupt surface irregularities are defined herein as offsets such as those caused by misplaced or loose forms, loose knots in form of Lumber, or other similar forming faults. Abrupt surface irregularities are measured using a straight edge held firmly against the concrete surface over the irregularity and the magnitude of the offset is determined by direct measurement.

GRADUAL SURFACE IRREGULARITIES

Gradual surface irregularities are defined herein as bulges and depressions resulting in gradual changes on the concrete surface. Gradual surface irregularities are measured using a suitable template conforming to the design profile of the concrete surface being examined. The magnitude of the gradual surface irregularities is defined herein as measures of the rate of change in slopes of the concrete surface.

The surface irregularities shall not exceed 6 mm for bottom slab and 12 mm for side slopes when tested with a straight edge of 1.5 meter in length.

The magnitude of gradual surface irregularities on concrete shall be checked by the contractor to ensure that the surfaces are within the specified tolerance. The Engineer-in-charge will also make such checks of hardened concrete surfaces as determined and ensure necessary compliance with such specifications.

4.2.13.7 HARDENED CONCRETE NOT WITHIN SPECIFIED TOLERANCES

Hardened concrete which is not within specified tolerances shall be repaired to bring it within those tolerances. Such repair shall be in accordance with paragraph 4.2.20 and shall be accomplished in a manner approved by the Engineer-in-charge. Such repair shall be done only after consultation with a representative of Engineer-in-charge regarding the method of repair. The Engineer-in-charge shall notify as to the time when repair will be performed.

Concrete shall be finished in a manner, which will result in concrete surface with a uniform appearance. The fins and any rough projections can then be rubbed down and the whole surface brought to an even finish by rubbing with a wooden float using a mortar of one part of cement by two parts of coarse sand as an abrasive. The mortar at the same time filling the voids, a neat cement works shall then be applied to give a smooth surface. If the concrete has set hard, the fins and rough projections, if any shall be removed by using carborandum brick or a paved grinding machine by chipping, before finishing-off with the smoothing wash. If the work of chipping is not done with care or if the surface exposed after removal of the forms cannot be satisfactorily dealt with in this manner due to bad work or for other reasons, a coat of cement plaster of 1:2 mix of the thickness as ordered by Engineer-in-charge shall be applied. No extra payment will be given for finishing concrete surface as instructed above in this clause.

4.2.13.8 PREVENTION OF REPEATED FAILURE TO MEET TOLERANCES

When concrete placements result in hardened concrete that does not meet the specified tolerance, the contractor shall submit to the Engineer-in-charge an outline of all preventive actions such as modification to the form system, modified procedure for setting screeds and different finishing techniques to be implemented by the contractor to avoid repeated failure.

The Engineer-in-charge **reserves the right to delay concrete placement** until the contractor implements such preventive actions, which are approved by the Engineer-in-charge.

4.2.14 REINFORCING BARS

Reinforcing bars shall be placed in the concrete as shown in the drawings or as directed. For anchoring the concrete to the hard rock, provision of anchor bar is made in the drawing and contractor shall place these anchor bars to the spacing and depth shown in the drawings.

The contractor shall make his own arrangement for procurement of steel of required specification of reputed factory for the work. Transportation from the place of supply to work site and all incidental charges will be borne by the contractor.

4.2.14.1 MATERIALS

Unless shown otherwise on the drawings the reinforcement to be used shall be High Yield strength deformed bars of grade Fe-415 conforming to IS: 1786-1985 specification for high yield strength deformed steel bars and wire for reinforced cement concrete.

4.2.14.2 PLACING THE GRILLS

Reinforcement shall be bent and fixed in accordance with the procedure specified in IS: 2502-1963 (code of practice for bending and fixing of bars for concrete reinforcement). All reinforcement shall be placed and maintained in the position shown in the drawings. Splices shall be located where shown in the drawing, provided that the location of the splice may be altered subject to written approval of the Engineer-in-charge.

Subject to the written approval the Engineer-in-charge, the contractor may for his convenience, alter splice bars at additional locations other than those shown on the drawings. All additional splices allowed shall be **at the expense of the contractor**. In order to meet design and space limitation on splicing, some bent bars may exceed usual clearance, cutting and bending of such bars from stock lengths may be required at the site.

Unless otherwise prescribed, placement dimensions shall be to the centre line of the bars. Reinforcement will be inspected for compliance with requirement as to size, shape, length, spacing and splicing etc.

Before reinforcement is embedded in concrete, the surface of the bars shall be cleaned of heavy flaky rust, loose scale, dirt, grease or other foreign substances, which in the opinion of the Engineer-in-charge are objectionable. Heavy flaky rust that can be removed by firm rubbing with burlap or equivalent treatment is considered objectionable.

As specified in clause 12.3.1 of IS: 456-2000, unless otherwise specified by the Engineer-in-charge, reinforcement shall be placed with the following tolerances.

- a. For effective depth 200 mm or less ± 10 mm
- b. For effective depth more than 200 mm ± 15 mm

The cover in no case be reduced by more than one third of specified cover or 5 mm whichever is less. Reinforcement shall be securely held in position so that it will not be displaced during the placing of the concrete and special care shall be exercised to prevent any disturbances of the reinforcement in concrete that has already been placed. Welding of bars shall be done as directed by the Engineer-in-charge and in conformity with the requirements of clause 12.4 of IS: 456-2000. Concrete cover shall be maintained as shown on the drawings.

4.2.14.2.1 REINFORCEMENT DRAWINGS

The Engineer-in-charge will supply drawings of reinforcement details and bar bending schedules for adoption.

4.2.14.2.2 MEASUREMENT AND PAYMENT

Measurement for payment of reinforcement bars will be based on the weight of the bars placed in the concrete in accordance with the drawings supplied by the Engineer-in-charge when conformance with these specifications drawings has been determined at the time of embedment. Except as otherwise provided below, payment for furnishing and placing reinforcing bars will be made at the unit price bid in the bill of quantities for furnishing and placing reinforcement bars which unit price shall include the cost of reinforcing bars, attaching wire, cutting, bending, cleaning, tying the grills, securing and maintaining in position of the reinforcing bars as shown in the drawings.

The total weight of bars placed as reinforcement in concrete shall be arrived at by adding the products of lengths each size and mass per meter (vide Table-1 and Para 6.2.1 of IS: 1786-1985) of that size of rod.

4.2.15 PREPARATION FOR PLACING

4.2.15.1 GENERAL

No concrete shall be placed until formwork installation of items to be embedded and preparation of surface involved in the placement have been approved.

The contractor shall supply concrete placement checkout cards (Placement Register) satisfactory to the Engineer-in-Charge and shall provide a watertight container for such cards at the convenient location near each individual concrete placement site. The cards shall list all the various work items for example "cleanup" and "embedded items" required prior to placement of concrete. After each work item for an individual placement has been completed that item on the cards shall be signed by contractor or his representative signifying completion of the required work. Engineers authorized by the Engineer-in-Charge will inspect the work during and after completion of each phase of the preparation and if the work is satisfactory will sign the checkout card (placement register). Approval of preparation of placement will not be complete until the contractor or his representative and above authorized Engineer have approved by signature to all applicable

items for the placement.

All surfaces of forms and embedded materials shall be free from curing compound, dried mortar of previous placements and foreign substance before the adjacent or surrounding concrete placement is begun.

Prior to beginning concrete placement, the contractor shall make ready a sufficient number of properly operating vibrators and operators, and shall have readily available additional vibrators to replace defective one during the progress of the placement. The Engineer's representative at the placement may delay the start of the concrete placement until the number of working vibrators available is acceptable.

4.2.15.2 FOUNDATION SURFACES

All surfaces upon or against which concrete is to be placed shall be free from frost, ice, water, mud and debris. Rock surface shall be free from oil, objectionable coatings, and loose semi-detached and unsound fragments. Immediately prior to placement of concrete, surfaces of rock shall be washed with an air water jet and shall be brought to uniform surface dry condition.

Earth foundation surfaces shall be wet to a depth of 15 cm or to impermeable material whichever less before placement.

4.2.15.3 CONSTRUCTION JOINTS

Construction joints are defined as concrete surfaces upon or against which concrete is to be placed and to which new concrete is to adhere, but which have become so rigged that the new concrete can not be incorporated integral with that previously placed. The provision of construction joints shall conform to clauses 12.4.1 and of IS: 456-978.

When the work has to be resumed on a surface, which has hardened, such surface shall be roughed. It shall then be swept clean thoroughly and wetted. For vertical joints, neat cement slurry shall be applied on the surface before it is dry. For horizontal joints the surface shall be covered with a layer of mortar about 10 to 15 mm thick, composed of cement and sand in the same ratio as the cement and sand in concrete mix. This layer of cement slurry or mortar shall be freshly mixed, applied immediately before placing of the concrete.

Where the concrete has not fully hardened, all litanies shall be removed by scrubbing the wet surface with wire or bristle, brushes, care being taken to avoid dislodgment of particles or aggregate. The surfaces shall be thoroughly wetted and all free water removed. The surface shall then be coated with neat cement slurry. On this surface, a layer of concrete not exceeding 15 mm. in thickness shall first be placed and shall be well recommend against old work, particular attention being paid to corners and close spots, and work thereafter shall proceed in the normal way.

4.2.15.4 CONTRACTION JOINTS

Contraction joints serve to provide for volumetric shrinkage of monolithic concrete and or movement between monolithic units at established joints, thus preventing formation of objectionable shrinkage cracks elsewhere in concrete. Prior to application for wax based curing compound to contraction joints, the surfaces of all joints shall be cleaned thoroughly of accretion of concrete or other foreign material by scraping, chipping or other means approved by the Engineer-in-Charge. Water stops, reinforcing bars and other embedded items shall be free of curing compound when adjoining concrete is placed.

4.2.16 PLACING OF CONCRETE

4.2.16.1 GENERAL

The contractor shall notify the Engineer-in-Charge before batching 'begins for placement of concrete. Placing shall be performed only on the presence of an authorised Engineer's representative. Placement shall not begin until after preparations are complete and the concrete placement check out card has been signed by the contractor or his representative and the authorized representative of the Engineer-in-Charge substantiating completion of all preparation for that placement.

All surface upon or against which concrete is to be placed shall be prepared in accordance with paragraph 4.2.15.

Re-tampering of concrete will not be permitted for any concrete, which has become so stiff that proper placing cannot be assured.

Concrete shall not be placed in standing water except with written permission of the Engineer-in-Charge and the method of placing shall be subject to approval. Concrete shall not be placed, in running water and shall not be subjected to running water until after the concrete has

hardened. Concrete shall be deposited as nearly as practical in its final position and shall not be allowed flow in such a manner that the lateral movement will cause of the coarse aggregate separated from the concrete mass. Methods and equipment employed in depositing concrete in forms minimize clusters of coarse aggregates. Clusters that occur shall be scattered before the concrete is vibrated. Forms shall be constantly monitored and their position adjusted as necessary during concrete placement in accordance with paragraph

4.2.12 and 4.2.13.

All concrete except canal lining shall be placed in approximately horizontal layers. The depth of layers shall not exceed 15 cm. The Engineer-in-Charge reserves the right to require lesser depth of layers where concrete cannot otherwise be placed and consolidated in accordance with the requirements of these specifications. All construction joints which intersect exposed concrete surface shall be made straight and level to plumb except as shown otherwise on the drawings. The placing of concrete shall be in accordance with clause 12.2 of IS: 456-1978.

If concrete is placed monolithically around openings having vertical dimensions greater than 60 cm or if concrete in decks, floor slabs or other similar part of structures is placed monolithically with supporting concrete, the following requirements shall be strictly observed:

- (1) Concrete shall be placed up to the top of the formed opening at which point further placement will accommodate settlement of fresh concrete. If concrete levels are specified beneath nearly horizontal structural members such as decks floor slabs, beams and girders or the levels being between the nearly horizontal members and the vertical supporting concrete below, concrete shall be placed to the bottom of the bevels before delay of placement.
- (2) The last 60 cm or more of concrete placed below horizontal members or bevels shall be placed with a slump of 50 mm or less and shall be thoroughly consolidated.

In placing concrete on uniform slopes so steep as to make internal vibration of the concrete impractical without footing, the concrete shall be placed in non-vibrating slip forms with screed extending approximately 0.75 meters back from its leading edge. Concrete ahead of the slip form screed shall be consolidated by internal vibrations so as to ensure complete filling under the slip form.

A cold joint is an unplanned joint resulting when a concrete surface hardens before the next batch is placed against it. Cold joints would be allowed only in the event of equipment break down or other unavoidable prolonged interruption of continuous placing. If such unavoidable delay in placing occurs, which make it that, unconsolidated concrete may harden to the extent that later vibration will not fully consolidate it, the contractor shall immediately consolidate such concrete to a stable and uniform slope. If the delay of placement is short enough to permit penetration of the underlying concrete, placement shall resume with particular care being taken to thoroughly penetrate and re-vibrate the concrete surface placed before the delay. If concrete cannot be penetrated with vibrator, the cold joint shall be then treated as a construction joint. Care shall be taken to prevent cold joints when placing concrete in any part of the work. The concrete placing rate shall ensure concrete is placed while previously placed adjacent concrete is plastic, so that the concrete can be made monolithic by normal use of vibrators/ tamping.

Concrete shall not be placed in rain sufficiently heavy or prolonged to wash mortar from concrete. A cold joint may necessarily result from prolonged heavy rainfall.

There shall not be any additional payment, over the unit price bid in the schedule for concrete by reason for any limitation in the placing of concrete, required under the provisions of this paragraph.

4.2.16.2 TRANSPORTATION

The transportation of concrete shall conform to clause 12.1 of I.S: 456-1978.

The methods and equipment used for transporting concrete from the batch plant to its final position in the placement and the time that elapses during transportation shall not cause measurable segregation of coarse aggregate or slump loss during transportation exceeding 5 centimetres.

Concrete shall be deposited as practical to its final position. The use of Aluminium pipe or Aluminium chutes for delivery of concrete will not be permitted. Concrete buckets shall be capable of promptly discharging concrete of the specified mix design and the dumping mechanism shall be capable of discharging at one location, small portions of concrete from a full bucket.

If used to transport concrete, the truck mixers shall meet the applicable requirements of

paragraph 4.2.10. The transporting equipment for placing concrete shall readily handle the place concrete of the specified slump. The Contractor shall when directed, replace in-adequate transporting equipment with acceptable equipment.

4.2.16.3 COMPACTION

The compaction of concrete shall conform to clause 12.3 of I. S 456-1978.

Concrete shall be consolidated by vibrators/ tampers. The vibrations shall be sufficient to remove all undesirable air voids from the concrete, including the air voids trapped against the forms. After consolidation, the concrete shall be free of rock pockets and honey comb areas and shall be closed snugly against all surfaces of forms and embedded materials. All concrete shall be properly consolidated before it hardens.

Except as herein after provided, consolidation of all concrete shall be by immersion type vibrators.

Immersion type vibrators shall be operated in nearly vertical position and the vibrating head shall penetrate and re-vibrate the concrete in the upper portion of the underlying layer. Care shall be exercised to avoid contact of the vibrating head with embedded items and with formed surfaces, which will later be exposed to view. Concrete shall not be placed upon either plastic concrete until the previously placed concrete has been thoroughly consolidated.

Form vibrators shall be used in conjunction with slip form lining machines to consolidate concrete in canal linings. Such vibrators shall be arranged for effective, uniform consolidation for the concrete. The Engineer-in-Charge or his representative may remove samples of the hardened concrete for testing and examination, and the Contractor shall repair, at no cost to the Government, the concrete from which such samples are removed.

Immersion type vibrators shall be operated at speeds of at least 7000 revolutions per minute when immersed in concrete. Form vibrators shall operate at speeds of at least 8000 revolutions per minute when being used to consolidate concrete. The Contractor shall immediately replace improperly operating vibrators with acceptable vibrators.

4.2.17 FINISHES AND FINISHING

The requirements for finishing of concrete surface shall be as specified in this paragraph, paragraph 4.2.12 and 4.2.13 or as otherwise indicated on the drawings. The Contractor shall notify the Engineer-in-Charge before finishing concrete. Unless inspection is waived, in each specific case, finishing of concrete shall be performed only when a Engineer's representative is present. Concrete will be tested by the Engineer-in-Charge in accordance with paragraph 4.2.13 where necessary to determine whether the concrete surface is within the specified tolerances.

Finished concrete which is not within the specified tolerances shall be repaired in accordance, with paragraph 4.2.20. Interior surfaces shall be sloped for drainage where shown on the drawings or as directed. Surfaces which will be exposed to the weather and which would normally be level shall be sloped for drainage.

Floating may be performed by use of hand or power driven equipment. Floating shall be started as soon as the screed surface has stiffened sufficiently and shall be the minimum necessary to produce a surface that is free from screed marks and is uniform in texture. Joints and edges shall be tooled where shown on the drawing or as directed.

After the surface of roadway slabs of concrete bridges have been wood floated, the surfaces shall be given a broom finish. The finish shall be applied when the water sheet has practically disappeared. The broom shall be drawn transversely across the pavement with adjacent strokes slightly overlapping. The brooming shall be completed before the concrete is in such a condition that the surface will be torn or unduly roughened by the operation. The finished surfaces shall have a uniform appearance and shall be free of corrugations exceeding 1.5 millimetres in depth. Broom shall be of a quality, size and construction and be operated as to produce a surface finish of satisfaction to the Engineer-in-Charge.

The finishing in lining be in accordance with Clause 5.7 of IS: 3873-1993. The finished surface shall be equivalent in evenness, smoothness and free from rock pockets and surface voids to that obtainable by effective use of a long handled steel trowel. Where the surface produced by lining machine meets the specified requirements, no further finishing operations will be required.

4.2.18 PROTECTION

The contractor shall protect all concrete against damage until its final acceptance by the Engineer-in-Charge. The contractor shall provide protection to prevent erosion to fresh concrete whenever precipitation either periodic or sustaining is imminent or occurring.

When precipitation appears imminent, the contractor shall immediately make ready at the placement site all materials, which may be required for protection of fresh concrete. The Engineer-in-Charge may delay placement of concrete until adequate provisions for protection against weather are made.

All fresh concrete surfaces shall be protected from contamination and from foot traffic until concrete has hardened. Hardened concrete surfaces, which have to receive finish, shall be protected against damage from foot traffic and the construction activity by covering with protective mats, plywood, or by other effective means. Method of protection shall be subject to approval by the Engineer-in-Charge.

4.2.19 CURING

4.2.19.1 GENERAL.

The contractor shall furnish all materials and perform all work required for curing concrete. All concrete including bed and sides of canal lining shall be cured by water curing.

The pre-cast slab for canal lining shall be cured by keeping them immersed in water for seven days

and by sprinkling water for another 21 days with straw canvass, Hessian or similar materials cover over slab.

The uniformed top surfaces of bridges decks shall be cured for 28 days with a damp sand cover or curing mat cover. The sand or curing mats shall not be kept so wet as to allow water to drain from them, which may stain other concrete. The sand or curing mats shall be removed after expiry of the curing period.

All concrete surfaces shall be treated as specified to prevent loss of moisture from the concrete until the required curing period elapsed or until immediately prior to placement of other concrete or back fill against those surfaces. Only sufficient time to prepare construction joint surfaces and to bring them to a surface dry condition shall be allowed between discontinuance of curing and placement of adjacent concrete.

Forms shall be removed within 24 hours after the concrete has hardened sufficiently conforming to IS: 456-2000 to prevent structural collapse or other damage by careful form removal. Where required, repair of all minor surface imperfection shall be made immediately after form removal. Prior to curing, minor surface repair shall be completed within 2 hours after form removal and shall be immediately followed by the initiation of curing by the applicable method specified herein. Concrete surfaces shall be kept continuously moist after form removal until initiation of curing.

4.2.19.2 MATERIALS

Concrete cured with water shall be kept wet at least for 28 days from the time the concrete has attained sufficient set to prevent detrimental efforts to the concrete surfaces. The concrete surfaces to be cured shall be kept wet covering them with water saturated materials by using a system of perforated pipes, mechanical sprinklers or porous hose or by other methods which will keep all surface continuously wet. All curing methods are subject to approval of the Engineer-in-charge.

4.2.19.3 COST

The cost of furnishing of all materials and performing all work for curing concrete shall be included in the price bid in the bill of quantities for the concrete on the particular curing methods are required.

4.2.20 REPAIR OF CONCRETE

Concrete shall be repaired in accordance with the clauses 5.7 of IS 3873-1978. Imperfections and irregularities on concrete surface shall be corrected in accordance with the paragraph 4.3.13 and clause 5.7 of IS: 3873-1978.

Repair to concrete surfaces and addition where required shall be made by cutting regular opening into the concrete and placing fresh concrete to the required lines. The chipped openings shall be sharp and shall not be less than 70mm in depth. The fresh concrete shall be reinforced and chipped and trowel to the surface of the openings. The mortar shall be placed in layers not more than 20mm in thickness. After being completed, each layer shall be compacted thoroughly. All exposed concrete surface shall be cleaned of impurities, lumps of mortar or grout and unsightly stains.

The cost of furnishing all materials and performing all work required in the repair of concrete shall be borne by the contractor.

4.2.21 MEASUREMENT OF CONCRETE

Measurement for payment of concrete required to be placed directly upon or against surfaces of excavation will be made to the lines for which payment for excavation is made.

The unit of measurement will be in cubic metre. In measuring concrete for payment, the volume of all opening, fixtures embedded pipes and metalwork each of which is larger than 0.1 square meters in cross section will be deducted.

4.2.22 PAYMENT FOR CONCRETE

Payment for concrete shall be made at the applicable unit price in therefor in the bill of quantities, which unit price shall include the cost of furnishing all materials and performing all works required for the concrete construction except that payment for furnishing and placing reinforcement bars and form work which shall be made at the respective unit price's bid thereof in the schedule.

4.2.23 DETAIL SPECIFICATION OF EXPANSION JOINTS/ CONSTRUCTION JOINTER (EJ/CJ) FOR CANAL STRUCTURE

Description of Items

The joint should be left in concrete/masonry in required places as per drawing and design. Embedded parts if any will have to be provided prior to casting of concrete/construction of masonry. Old surface of the concrete/masonry 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 - 4

TECHNICAL SPECIFICATIONS OF P.H. PORTION OF WORK

A) WATER SUPPLY & SANITARY INSTALLATIONS:

Materials of following standard manufacturers are to be used in the work. The contractor shall indicate, in the offer, the brand or make of the materials, for which the rates are quoted.

(a) Sanitary fixtures:

To be of best quality vitreous ware of porcelain.

- (i) Indian water closet
- (ii) Foot Rests
- (iii) Wash Hand Basin
- (iv) Kitchen Sink Hindware/Parry Ware / Neycer/ ISI marked
- (v) Urinals
- (vi) Drain Board
- (vii) Odisha Closet
- (viii) European Water Closet & Low Level Flushing Cistern.

(b) C.I. High Level Flushing Cisterns : Sushila Industries Prabhat Iron Foundry/
East India Steel / I.S.I. marked. "

(c) H.C.I. Soil Waste Pipes: Confirming to I.S.I. 1729-1954, having

- I.S.I.Mark.
- (d) **C.P. Bath Room Fittings:** Plaza/ Jaquar I.S.I. marked & confirming to-latest ISS
- (e) **Brass Fittings :** Shakti/Anupama /Luster/1.S.I.Marked.
- (f) **Gunmetal Valves :** Anupama / Leader / B.S.I.S.I. marked.
- (g) **G.I. Pipes (Medium Class):** Manufactured by TATA / JINDAL / B.ST. having I.S.I. Mark.
- (h) **Galvanised Iron fittings :** I.S.I. marked C/R brand.
- (i) **Paints:** Asian / Berger / Jonson/Confirming to I.S.S
- (j) **Cast Iron Manhole cover frame:** Sushila Industries / Prabhat Iron Foundry / East India Steel make confirming to ISS 7.26
- (k) **Stone Ware Pipes & Fittings :** Manufactured by Odisha Ceramic Industries / Odisha industries / Keshab Ceramic confirming to I.S.S. Specification No.651 / 1980 {Grade A}
- (l) **P.V.C. (S.W.R.) & P.V.C (Rigid.) Pipe/Fittings:** Manufactured by the Supreme Industries Ltd., Bombay / Oriplast, Balasore Duroplast confirming to I.S. Specification No. 4985/81 (Class IV)

(B) BUILDING MATERIALS:

(a) Bricks:

Bricks shall be of locally available best quality kiln burnt. Bricks shall be well burnt, uniform deep red, cherry or copper colored, free from cracks and flaws, well shaped, uniform in size, homogeneous in textures and shall omit a clear metallic sound when struck, bricks shall have a minimum crushing strength 75 Kg/Cm² and shall not absorb water more than 20% by weight.

(b) Cement Mortar:

Mortar shall be well mixed to a uniform colour and consisting in the proportion as specified in the items of work. Sand shall be measured on the basis of its dry volume and the quantity shall be adjusted for bulking of damp sand. Cement shall be mixed, taking 50 kg. or 0.035 Cum. in volume only required quantity that can be consumed within 30 minutes of adding water shall be mixed at one time.

(c) Cement:

Cement should confirm to IS-269/IS-455.

(d) Sand:

Locally available best river sand medium size.

(e) Coarse Aggregates:

The coarse aggregate shall be of hard granite stone and shall generally confirm to I.S. 389. Porous Course aggregate shall not be used. The aggregate shall be free from clay films and other adherent coatings. Aggregate containing clay films over the stone materials shall be thoroughly washed. The aggregate shall be from approved quarry and crusher broken. Course aggregates shall be composed of particles ranging between the sizes 2.36 to the maximum size as may be specified in the relevant item of work, within the range, the aggregates shall be well graded so as to produce a dense concrete.

(f) Reinforcements:

Mild steel Round Bars, coiled twisted and deformed bars of steel of medium tensile strength will be used as reinforcement as per drawing and design and directions. Mild steel bars shall conform to I.S.;226/1962 standard quality or IS:432/1966 - Grade-I. Black annealed wire (Not thinner than 24 gauge for tying the reinforcements shall be used).

SECTION - 5

TECHNICAL SPECIFICATION FOR SANITARY & PLUMBING WORKS

(A) Sanitary ware & allied fittings :

1. General:

All Sanitary fixtures and their allied fittings, should be of first quality, manufactured by Hindustan Sanitary Ware / Parryware / Nycer, These should be approved by the Engineer-in-charge of the G.P.H. Wing before use.

2. Squatting Pattern W.C. (pan) (Odisha Pattern Closets):

The water closet shall be of vitreous China of specified size and pattern, with an integral flushing rim. It shall have the flushing inlet at the back. The Odisha closet should be of approved quality confirming to I.S.S.-2656 (Part-III).

The squatting type Indian Water Closet (Odisha Closet) shall be sunk in floor sloped towards the pan in a workmanship like manner. The closet shall be fixed on a proper cement concrete base of 1:3:6 proportion, taking care that the cushion is uniform and even, without closet, to receive the specified thickness of the floor finishing. The joint between the Closet and the P.V.C. (S.W.R) trap shall be made with W.C. ring and rubber lubricant and shall be leak proof.

3. Flushing Cistern :

The flushing of the Indian water closet (Odisha Closet) shall be done by C.I. or Polyethylene High Level low-level porcelain valve-less syphonic flushing cistern of approved brand and quality I.S.I. Marked and capacity as specified. The connection between the cistern and water closet shall be made by 32 dia O.I. flush pipe, made from G.I. Pipe (Light Quality) or 32 dia P.V.C. Pipe as specified in the tender schedule. The flush pipe with an offset should be fixed to wall by using C.I. Holder Bat Clamps. The capacity of the cistern should be 10 Ltrs. as per I.S.S. 15 Ltrs. In case of low-level cisterns. The Cistern shall be fixed on cast Iron or Rolled Steel Cantilever Brackets (Bulltin type), which shall be firmly embedded in the wall, with C.C. 1:2:4. The Cistern shall be provided with 20mm dia P.V.C. Overflow Pipe with fittings, which shall terminate into mosquito proof coupling secured in a manner that will permit it to be readily cleaned or renewed.

The 32mm dia Flush Pipe shall be connected to the Water Closet by means of approved type joint. The Flush Pipe shall be fixed to wall by using C.I. Holder Bat Clamps. The bend and the Offset as required in the Flush pipe shall be made cold. The inside of the Cistern shall be painted with two coats of approved black bitumen paint. The Outer face of the Cistern, Brackets Overflow pipe and Flush Pipe etc., shall be painted with two coats of any synthetic enamel paint of approved shade and make, over a coat of priming. The cost of the rate quoted for the flushing cistern. The inlet connection to the Cistern shall be made with 450 mm 1 cmg 15 mm dia P.V.C. Heavy type connection Pipe.

4. Wash Hand Basin:

The Wash Hand Basin shall be of the White Vitreous China of approved quality, make and brand I.S.I, marked. It shall be one-piece construction with an integral combined overflow. The size of the basin shall be

as specified. Each basin shall be provided with one 15 mm dia C.R Brass Pillar Tap, 32mm dia C.R Waste, C.R. Chain and Rubber Plug, Unions, Joints, C.P Bottletrap cast complete in all respects of approved quality.

The Basin shall be supported on a pair of R.S. or C.I. Cantilever brackets (built in type) embedded and fixed in wall with cement concrete, 1:2:4. These brackets shall be painted to the required shade with two coats of approved synthetic enamel paint over a coat of priming.

The waste of the Basin shall discharge into a floor trap or Channel through bottle traps as specified. One 32mm dia C.P. Bottle Trap is to be fixed to the Waste of the Basin & the outlet of the bottle trap is to be connected to the waste pipe to discharge the waste to the Pipe, to discharge the waste to the aforesaid floor trap. The inlet connection to the Basin shall be made with 450mm Long 15mm dia Heavy type P.V.C. connection pipe.

5. Kitchen Sink:

Unless otherwise mentioned the Kitchen Sink and drain board (if used) shall be of white Vitreous China or fire clay as specified and approved quality, make a brand, confirming to T.S.S, It shall be of one piece construction with integral combined overflow. The size of the sink and Drain Board shall be as specified.

Each Sink shall be provided with one 15mm dia C.P. brass, Bib Cock, long body, 40mm C.P. Waste with overflow C.P. Chain & Rubber Plug, unions etc., complete in all respects as specified and of approved quality.

The sink shall be supported on a pair of M.S. or C.I. Cantilever Brackets (Built in type) embedded or fixed in position in the wall by Cement Concrete 1:2:4. The brackets shall be painted to required shade with two coats of approved synthetic enamel paint over a coat of priming. The waste should discharge into a floor Trap or Channel. The waste pipe should be 40mm dia P.V.C. Pipe jointed to the waste of the Sink with a Brass union nut.

6. Standing Urinals :

The Urinals shall be flat pattern lipped front basin of required dimension of White Vitreous China and one piece construction with internal flushing box rim of an approved make and brand as specified. It shall be fixed in the position by*using wooden plug embedded in the wall with screws of proper size. Each Urinal shall be connected to a 40mm dia RV.C. Waste Pipe, which shall discharge into a channel of floor trap. The lip of Urinals shall be kept at 525mm from floor level, while fixing the Urinal on wall.

Where no. of Urinals are fixed in a line, the distance between the centres to centre of each Urinal shall be kept 750mm. and each Urinal should be separated from one to other by a partition plate. The centre to centre of partition plates shall be kept 750mm apart. The partition plate shall be of one-piece 25mm thick marble plates, cut to size and front corners rounded. The partition plates shall be embedded in wall with cement concrete and finished smooth. The bottom of the partition plate should be kept 350mm above floor level and top should be kept at 1250mm above floor level. The plates should project 600mm from wall surface. The width of the plates to be embedded inside the wall should not be less than 100mm. The thickness of the plates shall be minimum 25mm.

For flushing the Urinals each Urinals shall be connected with one 20mm dia G.I. Pipe (Medium Class), One of this pipe shall be inserted into the inlet of the Urinal and jointed with Jute and putty where as the other end is connected either with a Tee or Bend with the 25mm dia size Water Pipe Line fixed on the wall horizontal above the Urinals. In each 20mm dia flush pipe one 20mm dia cum-metal Gate value, the water will flow to thermal of Urinal through the inlet pipe and flush the Urinal. After flush, the valve can be closed to avoid wastage of water. One 40mm dia P.V.C. Waste Pipe shall be connected to the waste of each Urinal, to discharge the Waste into the Channel of Trap. One end of this Waste pipe shall be made a cup size to fit into the projected waste and tightened with screws.

7. Squatting Urinal Plates:

The Urinal Plates shall be of White Glazed Vitreous China with integral flushing rim of size 450 X 350mm of approved make and brand as specified. There shall be white vitreous channel with stop and outlet pieces in front. These plates shall be fixed on C.C. at 75mm to 100mm above floor level.

For flushing arrangement, one 25mm dia G.I. Common Water Pipeline (minimum size) shall be fixed on the wall parallel to floor. For each urinal one 20mm dia G.I. Branch Pipe shall be taken down up to 200mm from floor level just at the centre of each plate, in which one 20mm dia Gate Valves is fixed at 350mm above floor level. At 1200mm height, the 20mm dia flush pipe shall be divided into two branches shall be taken downward and connected to the inlets of the urinals plate at floor level. By operating the valve as above, the water will rush into the rims of the urinal plate and flush it.

Where there are number of urinals fixed in a line, each urinal should be separated by a partition plate fixed in the centre of two urinal plates. The centre-to-centre distance of the partition plates shall be kept 750mm.

The partition plates shall be of one-piece marble plate, 25mm thick, cut to sizes and front corners rounded. The plates are to be embedded in wall with cement concrete and finished smooth. The bottom of the partition plates shall be kept flushed to urinal top level and the top level of partition plate shall be kept at 1200mm from the urinal plate top and the projection from the wall shall be 600mm. The width of the plate to be embedded inside the wall should not be less than 100mm.

(B) Soil and waste pipes and fittings

1. H.C.I. Pipe Fittings

The Cast iron Soil, Waste and design pipes (spigot & socket joints) shall be of make and brand as specified (under specification of materials), confirming to I.S.S. 3989-1970 and ISI marked with approved clamps are to be used. The pipes and fittings shall be free from cracks, laps, pinholes, and other imperfection and carefully cited. The access door fittings shall be designed and made so as to avoid dead space in which filth may accumulate and door shall be provided with 3mm thick rubber insertion packing when closed and bolted.

WEIGHT OF HCI PIPES

2.	Dia of Pipe in mm	Thickness in mm	Length 1.8mtr. D/s	of pipe 1.8mtr.	& width	piece
	50 mm	5mm	16.00kg.	15.00 kg.		
	75 mm	5mm.	13.83kg.	16.52kg.		
	100 mm	8mm	24.00kg.	22.00kg.		
	150mm	8mm	26.70 kg.	31.82kg.		
		Tolerance 10%				

3. The jointing should be done with pig lead confirming to I.S. 782-1966 - grade 99.94. The spigot and of Pipes and Fittings should enter into the socket end. The annular space shall be packed with spun yarn gasket, compacted so as to leave a depth for receiving required quantity of lead in a continuous pouring from ladder. After pouring lead in the joints in full, caulking is to be done three times round with the caulking chisels, so that the joints may be sealed with lead. The depth of lead in a point should be 35mm and the rest depth of the joint should be packed with spun yarn Gasket.

4. Requirement of lead and Gasket cement for jointing H.C.I. Pipes (Each Joint)

Dia of pipe in mm.	Lead in kg. (same for lead & cement joint)	Gasket in kg.	Cement kg.
100	1.2kg.	0.13kg.	0.12kg.
50	0.36 kg.	0.06 kg.	0.06 kg.

5. The inside of the pipes and fittings shall be well coated with special tar or bitumen solution of approved quality. Where the pipe and fittings are laid below the ground, the outer surface of the pipes and fittings shall

also to be painted with two coats of black anticorrosive paint of approved quality. On completion of the work, the exposed pipes and fittings are to be painted with two coats of synthetic enamel paint of approved colour & quality over a coat of red oxide primer. The cost of paint should include in the rates.

6. Soil pipes for ventilation is to be connected to the sewer at its floor and without a trap and be carried to such a height, at least above roof level, to prevent damage to health by commission of foul air, The pipe shall terminate as open and protected by a cowl.

7. The waste water pipe shall be connected with the nearest yard gully or a surface drain.

8. The traps should be of hard cast iron and should have a water seal at least 50mm deep.

9. All the soil and waste pipes and fittings, after laid and fixed shall be smoke tested, to the entire satisfaction of the Engineer-in-charge. The Cost of testing is to be included in the offer. For smoke-test the materials usually burnt greases cotton waste, which gives out a clear pungent smoke, which is easily detected by sight and smell. Smoke shall be pumped to the drains from the lower end from a smoke machine, which consists of lower, and burner.

a) **P.V.C (S.W.R.) & P.V.C. (Rigid) Pipes & Fittings**

9.01. The P.V.C. (S.W.R.) and P.V.C. (Rigid), soil Waste & Vent Pipes (Spigot & Socket, & couples joints), shall be of make & brand as specified (Under Specification of materials) confirming to I.S.S., B.S.S. & DIN are tube used.

The main specification of P.V.C. Soil & Waste pipes and fitting are as below.

Materials – Un-plasticized Poly Vinyl-Chloride (UPVC).

- | | | |
|----|--|---|
| b) | Color - | Grey |
| c) | Dimensions | - |
| | (i) Diameter | - Fittings - 75mm/110mm/63mm & 63mm. |
| | Pipes | - 75mm, 110mm, on lengths of 3.or 6 mtr. |
| d) | Wall thickness | - Fittings - Minimum 3.2mm at any port. |
| | Pipes | - As per application |
| | For Rainwater | - 75mm-1.8. to 2.2.mm, 110mm-2.5. to 3mm |
| | Waste & Soil | - 75mm -1.8 to 2.2mm, 110mm -2.5 to 3 mm, 63mm – |
| | Underground drainage with | |
| | light/NIL Traffics | - 110mm - 2.5 to 3mm |
| | Light/Nil in Heavy traffic | - 110mm 3.7 to 4.3mm |
| e) | Standard Confirming to Attributes Confirms to Standard No. | |
| | i) Fittings & Wall B.S.4514, DIN 10531 | |
| | Thickness | - DIN 19534 I.S.7834 - PVC (Rigid) |
| | ii) Pipe Wall thickness | - IS 4905 |
| | iii) Rubber ring | - IS 5382 |
| | iv) Fitting dimensions | - DIN 19531 - P.V.C.,
DIN 19534-S.W.R.
IS - 7834 V.C. (Rigid) |
| | v) Pipe Dimensions | - IS 4985 |

b) **Laying instructions & Jointing Procedure**

1 **Jointing of P.V.C. (S.W.R.) Pipes & Fittings**

Clean the outside of the pipes spigot and the inside of the sealing groove of the fitting. Apply the rubber lubricant, to the spigot end, sealing ring and pass the spigot end into the socket, containing sealing ring, until fully homed. Mark and position of the Socket edge with pencil on the pipe, then withdraw the pipe from the socket by approx. 10mm towards thermal expansion gap.

2 **Fixing of the Pipes and fittings on wall surface.**

P.V.C. pipes both (S.W.R.) & (Rigid), fixed on wall surface, are to be supported by P.V.C. pipe clips, specially made for these pipes, with horizontal runs, the pipe clips should be spaced at intervals of more than

10 times the outside diameter of the pipes. In vertical lines the clips are to be spaced at intervals of one meter to a maximum of two meters according to pipe diameter. •

3 Jointing of P.V.C. (Right) Pipe Fittings

Clean the Outside of the pipes and inside of the socket of a fitting of the inside of the couplers (where 2 plain ended pipes are jointed) of. Apply solvent cement solution, evenly and smoothly on the outer surface of the pipe end and inside surface of either the coupler of the socket and pass the pipe end into the socket of the fittings. Up to full depth of socket. In case of jointing 2 plain-ended pipes 1st. push the coupler up to half depth on the end of one pipe and the outer half of the coupler should be pushed to the end of other pipe and thus, both pipes are jointed.

4 Fixing of P.V.C. pipes and Fittings through holes of Walls or Chajja of roofs etc.

The Wall/concrete slots should allow for a stress free installation, Pipes and fittings to be inserted into the slots, without a cement base, have to be applied first with a thin coat of P.V.C. Solvent cement, followed by sprinkling of dry sand (medium size). Allow it to dry. This process gives a sound base for cement concrete fixation, around the pipes/fittings while mending the damages.

5 Anti-syphonage Pipes

All the antisiphonage pipes and fittings to be used are of 63mm. If these are not available under the items of P.V.C. (S.W.R.) materials, 63mm pipes and fittings, manufactured under P.V.C.(right) materials can be used, since the raw materials for both is same.

6 All traps should have a minimum water seal of 50mm as per I.S. 5329 and IS 2556 (Part XIII). Where antisiphonage connection is required, the traps to be supplied and used should have a 50mm antisiphonage vent horn on the outlet side. All the Traps used with the closets, should be of the size 125mm X 110mm i.e. Inlet (Socket end) of 125mm & outlet (spirit end) of 110mm only.

7 Installation of Water Closet

Determine the correct Location of the P/S Trap & set on a firm base, relative to the floor finish by pouring concrete on a slab. Bedding can be carried out by pouring concrete around the trap, ensuring that the traps outlet is left clear of concrete. Place the W.C. Connector ring to the socketed end of 125/110mm R/S trap. Apply rubber lubricant on W.C. Connector ring as well as outer side of water closet (connection point) and now complete the joint by pushing the W.C. to home of 125mm socket of the trap.

8 P.V.C. (Rigid) Pipes and Fittings

63mm (O.D.) P.V.C. Pipes to be used for these work either in antisiphonage system or elsewhere, should be of "Quick Fit" Pipes Class 2 (4kg. F/Cm²), Quick Fit, Pipes have one end socketed. The P.V.C. (Rigid) fittings, such as 63mm elbow, 63mm equal Tees 110mm x 63mm reducer etc. used in the work, should be of injection-molded fittings.

9 One -'jointing rubber ring will be available, with each P.V.C. (S.W.R.) pipe and fitting and hence, the cost of therein will not be added in the joint.

10. Measurement

All pipes shall be measured not/length as laid or fixed and shall be measured over all fittings such as bends, junctions, traps etc. The length shall be taken along the center line of the pipes and fittings. Fittings will be counted extra over.

1. Before fixing and painting, the pipe shall be tested hydraulically to pressure 0.4Kg/Cm² for pipes under I.S.-1729/1964 and at a pressure 0.7 Kg/Cm² for pipes under I.S. 3989-1970 without showing any sign of leakage, sweating or other defect of any kind. The pressure should be applied internally and shall be maintained for not less than 15 seconds.

c) Water Supply Pipes and Fittings:

1. Materials.

All galvanized Iron Pipes are to be of mild steel continuous welded, screwed tubes, medium quality conforming to I.S.S. and bearing ISI Marks manufactured by reputed Firms and approved brands as specified. The pipes shall conform to IS.1239 (Part-I) -1975. All G.I. Fittings shall be of 'R' Brand manufactured by M/s. R.M. Engineering Ltd., Ahmedabad and 'C' brand manufactured by Present Engineering works or equivalent best quality.

2. Laying of Pipes

The layout of the mains and service pipe set etc., will be done in accordance with the drawings. The contractor is to mark out the exact position of the pipes and fittings at site and take approval of the Engineer In-charge, before taking up the work.

3. Where the Pipes are laid, underground these must not be laid less than 450mm below ground level and coated with one coat of approved black bituminous paint. For laying the G.I. pipes and fittings below ground level, the width and the depth of the trenches for different dimensions for the pipes shall be given as below :

Dia of Pipe	Width of Trench	Depth of Trench
15mm to 50 mm	300 mm	600 mm
65mm to 100mm	450 mm	750 mm

The pipes shall be laid on a layer of 75mm thick sand and filled up with sand up to 75mm above pipes and the remaining portion of the trench shall then be filled up with proper ramming as described in "Excavation and refilling". The surplus earth shall be disposed of as directed.

Thrust or anchor blocks of cement concrete 1.2.4 in hard granite chips shall be constructed on all bends or branches to transmit the hydraulic pressure without impairing the ground and spreading it over a sufficient area. Pipes shall not be laid to pass through manholes, catch pit, drain, where, it is unavoidable the pipes shall be carried in sleeve pipe of M.S./G.I., as approved by the Engineer-in-charge. The rate should include such a situation.

4. Where Pipes run along walls, the same are to be fixed to the wall with holder bat clamps /M.S. Hooks as below:

Dia of pipe in mm	15	20	25	32	40	50
Horizontal line	2m	2.50m	2.50m	2.50m	3m	3m
Vertical line	2.5m	3m	3m	3m	3.5m	3.5m

Where the pipes are passing through the R.C.C. / Masonry wall / Column / beam or pillars, these must pass through the appropriate higher sizes of C.I./G.I Sleeve Pipes and are to be included in the rates. In case the pipes are embedded in walls and floors it should be painted with one coat of anticorrosive paint of approved quality. ,

All pipes should be fixed horizontal and vertical. For taking the pipes through the walls and floors & roof slabs etc. the holes shall be made by filling with chisels or jumper and not by dismantling the brickwork or concrete. After fixing, the holes shall be made good with cement concrete 1:2:4 and properly finished with C. Plaster 1.4 to match the adjacent surface. Union Nuts are to be provided in each of the vertical riser or drop on and from G.I. Tank and near the Valve and as and where necessary. The long screw fittings of 3 mtrs. for long horizontal lines and inside the lavatory / Kitchen etc.

5. After laying and jointing the pipes and fittings shall be inspected under working condition of pressure and flow. Any joint found leaking pipes should be removed and replaced without extra cost. The pipes and fittings after they are laid shall be tested to hydraulic pressure of 6 Kg/Cm². The test pressure should maintain without loss of for at least half an hour.

6. Painting

On completion of the test, the exposed pipes and fittings are to be painted with two coats of synthetic enamel paint of approved color and brand over a coat of priming.

7. Measurement

The length shall be measured in running meter. Correct to centimeter for the finished work, which shall include the pipes and fittings such as Bends, Tees, Elbows, etc., but excludes brass or Gun-metal fixture like tap, Cooks, Valves, PVC connection pipes etc.

8. Ball Valve

The ball valve shall be high or low pressure class as stipulated in the Tender Schedule and shall confirm to I.S. 1703-1968, The nominal size of ball valve shall be that corresponding to the size of Pipe for which it is used. The Ball valve shall be of brass or gun-metal and the float for low pressure polyethylene and for high pressure in copper. Each and every ball valve while in closed position shall withstand and internally applied hydraulic pressure of 20 Kg/Cm² for a minimum period of two minutes without leakage or sweating.

Every high pressure ball valve when assemble in working condition, with the float immersed to not more than half its volume shall remain closed against a test' pressure of 10.5Kg/Cm² and a low pressure ball valve against a test pressure of 5.3 Kg/Cm².

Polyethylene floats shall be watertight and non-absorbent and shall not contaminate water and with do jointing adhesive jointing parts. The minimum thickness of the copper sheet used for making copper floats shall be of 0.45 mm. The thickness of materials of the float shall be uniform throughout.

9. Ferrule

The ferrules for connection with C.I. main shall generally confirm to I.S. 2692-1964 and shall be of nominal bore as specified. The ferrule shall be fitted with 3 screw and 1 plug or valve capable of complete cutting off the supply to the connected pipe as and when required. For fixing the ferrule, the C.I. main shall be drilled and tapped during non-supply hour at 45 to the connected Pipe as that when required. The ferrule must be so fitted, that no portion of the sunk shall be left projecting within the main on which it is fitted. After the

ferrule is connected, one C.I. bell mouth cover or with bricks (as specified) shall be kept over the ferrule to cover the ferrule to protect it and the cost thereof is to be included in the item, even if there is no mention.

10. Non-return Valve (Check Valves)

The non-return valve shall be of Brass or Gunmetal and shall be of horizontal or vertical flow type and of the size as specified and confirm to I.S. 7810-1959 and I.S. 778-1957. The approximate weights of the valves are given below.

Dia in mm	Horizontal type (in kg)	Vertical type (in kg)
15	0.30	0.25
20	0.55	0.25
25	0.90	0.75
32	1.25	0.90
40	1.70	1.20
50	2.90	1.45
65	5.25	2.15
80	7.70	4.10
	±Tolerance 5%	

11. Foot Valve

Foot valve is generally placed at the lower end of the suction pipe of the centrifugal pump to prevent the suction pipe from emptying. On vertical non-return valve may also be fixed in place of foot-valve. The foot valve shall confirm to I.S.038-1967.

12. Water meters (Domestic types)

Water meter up to 50mm nominal size shall confirm to I.S.-779-1968. The meter body shall be of bronze/ Gun-metal and marked to read in liters complete with registration box and lid. The water meters shall be provided with Strainers. Strainers shall be of material, which is not susceptible to electrolyte, clean and shall be fitted on the inlet side of water meter. It shall be possible to remove and clean the strainer and not permit disturbing the registration box. The offer should include the same. The water meters shall bear ISI Mark.

13. Bibcock & Stopcock

These shall confirm to I.S.781-1967 and bear ISI Mark. The bibcock is a draw off tap with a horizontal inlet and free outlet and stopcock is a valve with a suitable means of connection for Insertion in a pipeline for controlling or stopping the flow. This shall be of screw down type. The cock shall open in anti-clockwise direction. The stopcocks should be of C.P open type/concealed type/angle valves type as specified in tender schedule. Bibcock should be also C.P Brass bibcock.

14. Full way Valve (Brass)

Full way valve is a valve with suitable means of connection for insertion in a pipeline for controlling or stepping the flow. The valve shall be of brass fitted with a cast-iron wheel and shall be of gate valve type confirming to I.S, 780-1960, opening Full way and of the size as specified.

Dia in mm	Flanged End Valves in kg	Screwed End Valve in kg
15	1.021	0.567
20	1.503	0.680
25	2.498	1.077
32	5.232	1.559
40	6.082	2.268
50	6.691	3.232
65	10.149	6.840
80	13.281	8.845

15. Gun Metal Full way Valve

This shall be of the Gun-Metal fitted with wheel and shall be of Gate-Valve type opening full way. This shall confirm to I.S, 778-1971. Class I. The Valves should bear ISI Mark.

TECHNICAL SPECIFICATION FOR STONEWARE PIPE ETC.

1. Stoneware Pipes (Materials)

The S.W. pipes & fitting should be of Grade 'A' confirming to I.S 651/1965. The pipes shall be sound, free from visible defects such as fire crack or hair crack and flow or blister. The pipes shall give a sharp clear line when struck with a light hammer and should be perfectly salt glazed.

Internal dia of Pipe in m.m.	Thickness of the Barrel in m.m.	Weight of each pipe in kg.
100	12	14
150	16	23
200	17	33
230	19	44
250	20	52
300	25	79
350	30	100
400	35	125
450	38	147

The length of pipes is 600mm exclusive of the internal depth of socket.

2. Excavation of Trench for laying Sewer Pipes

The trenches for the pipes shall be excavated to the lines & level as directed. The bed of the trench shall have to be evenly dressed throughout from one change of grade to the next. The gradient is to stout by means of sight rails and boning rods and required depth be excavated at any point. The depth of the trench shall not less than one meter, measured from top of the pipe to the surface of the ground under roads and not less than 0.75m elsewhere. The width of the trench shall be the nominal diameter of the pipe plus 350mm. The bed of the trench if in soft or made up earth, shall be well watered and rammed before laying the pipes and the depressions if any shall be properly filled with sand and consolidated in 200mm layers. Depending on soil condition, piling may even be necessary if so desired by the Engineer In-charge. If rock is met with, it shall be removed 150 mm below the level of the pipe and the trench will be refilled with sand and consolidated.

The excavated materials shall not be placed within One Mtr. or half of the depth of the trench whichever is greater from the edge of the trench. The trench shall be kept free from water. Shoring and shuttering shall be provided wherever required. Excavation below water level shall be done after dewatering the trenches.

After the excavation of the trench is completed, foundation of cement concrete 1:4:8 in hard granite metal (size 40mm) shall be laid with proper level all along under the length of the pipe with launching on all around concrete as per drawing.

3. Laying, Jointing, haunching of the Pipes and fittings.

Drain Pipes (S.W. pipe & other pipes used for drain and Sewer) shall be laid in straight lines and to the even gradients as shown in the layout drawings. The socket end of the pipes shall face stream. Adequate care shall be exercised in setting out and determining the level of the pipes and the contractor shall provide suitable instruments, templates, sight rails, boning rods and other equipments necessary for the purpose. In the case of pipes with joints to be made with loose collars, the collars shall be slipped on before the next pipe is laid. In those joints, a tight ring of twisted tarred jute soaked in cement mortar filling to ensure proper alignment and prevent. Cement entering the pipes, Cement compound joints is to be finished with proportion 1:1 with 45 beveling. The joints are to be kept wet with wet bag until the same are properly set with. The cement mortar joints shall be cured at least for 7 (Seven) days.

In the case of S.W. Pipe joints (socket & spigot), they should be caulked first with tarred jute (Spun) of required diameter, almost quarter depth of the socket, after which cement mortar 1:1 is pushed in with wooden chisel and finishing beveled at outside at 45 degree. Instead of jute of hump rubber gasket of proper size may also be used. The whole joint must be cured for not less than three days. In case of pipes less than 250mm dia, joints should be made at ground level with three pipes at a time and for larger ones two pipes at a time and after curing they should be soiled in foundation with the help of the ropes. All pipes should be properly launched with cement concrete 1:3:6 with washed gravel where the pipes are crossing the drain or all round concrete 1:3:6 with washed gravel is to be done to 150 mm thick over the barrel of the pipe. The whole of the drain work shall be tested when laid, and at the completion of the contract, to the satisfaction of the Engineer-in-charge and shall be retested if necessary until found satisfactory. The test shall be made by means of water under pressure at the highest point of the Section under test and providing an air pipe at the lower end of the line. Maximum head of 5 (five) feet (1.5m) must be maintained.

4. Excavation and refilling.

Excavation for drain and pipe trenches shall be straight and to correct depth and gradient. The trench bottom shall be of required width as per specification to allow working space for pipe jointing.

Excavated materials shall be dumped away from the site as directed by Engineer-in-charge. Suitable precautions are to be taken to prevent in flow of water into the excavated area, during construction.

The contractor at his own expense shall pump out or otherwise remove any or all water which during the continuance of contract may be found in the excavated trenches to keep the trench clear of water during the work under progress. The pipeline shall not be refilled and covered, until the line therein has been passed and tested.

5. Buried Services

All pipes, cable mains and other services exposed by the excavations shall be effectively supported by timbering or other means for which no extra payment will be allowed. The contractor shall be responsible for any damage occurring to buried services and make good the same at his own cost to the satisfaction of the Engineer-in-charge.

6. Trench condition :

Where a trench is excavated and refilled after laying the pipe, settlement of the earth in the refilled trench take place. The filling above the top of pipe, settles relatively, more than the sides of the trench, thereby developing frictional resistance. The contractor is required to take special precaution against this, while refilling the trenches. Procedure for backfilling as stipulated earlier should be strictly followed.

7. Inspection Chambers/Manholes

At every change of alignment, gradient or diameter of a drain there shall be a manhole or Inspection Chamber. The maximum distance between man hole chamber shall be 30 metres for the linelaid straight.

All manhole and inspection chamber shall have internal dimension as shown in drawing and B.O.Q. The depth of invert shall be fixed to the gradient. The foundation for Manhole shall be 175mm thick & with cement concrete 1.3.6 in hard stone metal / granite metal of 40mm size. The concrete shall project 150mm beyond the external faces of the brickwork.

The brick masonry shall be done in cement mortar in the proportion of 1:4 and thickness of the brick wall should be 250mm thick up to 1200mm depth from Ground Level and beyond that the wall thickness shall be maintained 375mm. The inside surface of the walls of the chamber, shall be finished with cement plaster 1.3 and outside with cement pointing 1.3. In addition to this, the inside surface should also be provided with cement punning.

On the top of base concrete channeling on C.C. 1.2.4 with granite chips is to be done keeping the diameter equal to the dia of drain pipe and depth equal to half of the dia of pipe. The channel, 'should' be done longitudinally at the centre, connecting both the ends of the pipe. The channel is to be hunched up with concrete 1.2.4 with hard granite chips of size 12mm sloping upwards from the edge of channel to meet the side of chamber at gradient of 1.6. The channel and benching are to be finished smooth and cement mortar 1.3 and punning unless it is unavoidable. The branch should deliver sewerage in the Manhole in the direction of main flow and the junction must be made with care so that the flow in the main is not impeded. Channels for drains coming from the side of the Manhole Chamber, shall be curved to meet the main drainage channels.

The Manhole and Inspection Chambers shall be covered with R.C.C. cover slab of thickness 100mm to 150mm according to the requirement at site. One C.I. Manhole cover of diameter and weight as stipulated in the tender schedule shall be fixed, on the cover slab. Unless otherwise mentioned the C.I. Cover and Frames and shall conform to I.S. 1726/1960. Heavy duty covers etc., under heavy vehicular traffic condition and capable of bearing wheel loads up to 11.25 tons, are to be used and medium duty under light type wheel traffic loads and light duty for domestic premises are to be used. Covers and Frames shall be clearly cast, double water seal type and they shall be free from all and sand holes. The cover shall be gas tight and water tight with proper water-seal. The C.I. Cover and frame shall be coated with two coats of black bituminous paint. The frame of Manhole cover shall be fixed on the slab while the slab is cast. R.C.C.M.H. covers of 50cm dia and 100mm thickness shall be fitted in line of C.I.M.H. cover if stipulated in the bill of quantity of the tender schedule.

8. Gully Trap Chamber

The size of chamber for 100mm HCl yard gully shall be of 250mm X 250mm (Inside). Foundation with 100mm thick cement concrete 1.3.6 with hard granite metal of size 40mm from outer surface of wall and Brick work in cement mortar 1.4, 125mm thick, depth up to 600mm maximum. The finishing of masonry wall both inside and outside should be done in cement mortar 1.4 cement punning should be provided on the inner surface the trap should be buried in cement concrete 1.2.4 in H.G. chips up to the mouth and one hinged C.I. Grating of size 300mm x 300mm are to be fixed on the top of mouth of Gully trap to arrest rubbishes shall be provided. The foundation, should project 75mm from outer.

9. Kota/ Marble Stone flooring

The Kota/Marble stones shall be of thickness specified but not less than 20mm and of uniform with edges absolutely square & straight. They shall be laid in Cement Mortar (1.4) over masonry or concrete base. The sides of the stones shall be arranged to butt against each other truly so as to come the joints practically invisible and certainly not more than 0.8mm in width anywhere. The joints shall not be filled with mortar but may afterwards be grouted with neat white cement mixed with matching colour pigment. When the floor has completely set, it, should be polished with pumice stone and finally with pads of felt.

10. Glazed tile dado

The glazed porcelain tiles shall be of approved size and thickness 5mm to 6mm with edges absolutely straight & surface accurately plain. They shall be fixed in 6mm. thick cement mortar 1.3 using cement slurry over pre-cement plastered base. The sides of the tiles shall be arranged to but against each other truly so as to make the joints practically invisible. However, the joints may be grouted with white cement mixed with coloring materials to match the tiles and neatly cleaned leaving no trace of excess grouting materials. The tiled surface and edges should be perfectly vertical and straight. The corner points must be normally right angled unless the site condition demands otherwise,

ADDITIONAL APPENDIX TO BILL OF QUANTITY:

(For P.H. Items of Work)

1. The quantities of items mentioned in the tender schedule may increase or decrease during execution of works but the contractor will complete the work as per his tendered rates in accordance with the instruction of Engineer in charge of G.P.H. wing.
2. **Specification:** The standard PHD and PWD specification will be followed for execution of work. During the course of execution of work, the instructions of the Engineer in charge shall be final and binding.
3. The Sales Tax element should not be added to the analysis of rates and the previous practice should be followed as per the Works Department letter No.IIT.22-89-18170 dt.18.7.1989
4. There should be no clause either in the tender or in agreement for payment of any additional claim on account of Sales Tax on completed works which will be deemed to be recovered by existing omnibus stipulation as per the works Department letter No.TIT 22/89-18170 dt.18.7.89.
5. It is the responsibility of the Contractor to arrange watch and ward to the installations until testing commissioning and handing over for which no extra payment towards watch and ward will be paid,
6. The contractor shall maintain a separate site order book for P.H. portion of work.
7. The P.H. portion of work shall be open for inspection by the authorities of P.H. Circle (R&B) Odisha, Bhubaneswar and the higher authorities and instructions imparted during the course of Inspection should be binding on the contractor.
8. Materials not covered by any of the above categories of items in the bill of quantity have to be approved by the competent authorities before utilizing the 'same in works. In such event, the payment of such item will be made as per actual on due approval by the competent authority.

11. All materials required for the work shall be supplied by the contractor as per standard specifications appended with due approval by the Engineer in charge of G.P.H. Wing. In case the materials as per make specified are not available, the materials of equivalent make and as per I.S. Specifications or of best quality when not covered by I.S. Specifications can be utilized on prior approval of concerned S.E./ E.E., GPHD (R&B) Circle/Division or the officers duly authorized. It is binding on the part of the contractor to use such items of materials which are available in the Departmental store and in such case the deduction from the bills will be made at stock issue rates.

SECTION - 6

TECHNICAL SPECIFICATION OF INTERNAL ELECTRIFICATION WORKS

The details of internal wiring, the position of fittings, fans, switches and plug sockets etc. are indicated in the layout drawings. The position of light fittings, fans, switchboards etc. indicated in these drawings are only for the guidance of the supplier and the actual position of these shall be mutually decided between the supplier and the purchaser. The supplier shall submit the purchaser of his consideration and approval all runs of wiring and the exact position of all the points and the switch boxes first marked on the points buildings.

All internal wiring shall be done in conformity to the latest Indian standard specification/Rules, code of practice adopted by CPWD and other standard practices prevalent in the part of the country. For the purpose of the specification the terminology used shall be as defined in IS:732 and IS:1356 of the definition of points wiring. The installation shall be carried out in conformity to all requirements of IE Act, 1910 and IE Rules 1956.

- a) Ceiling rose in (in case of ceiling and exhaust fan).
- b) Ceiling rose or connector (in case of pendants except stiff pendant points)
- c) Bank plate (in case of stiff pendant).
- d) Socket outlet (in case of socket outlet points)
- e) Lamps holder (in case of wall Bracket, batten holder bulk head fitting and similar other fittings)
- f) Call bell / buzzer (in case words 'via' the switch shall be read 'via' the ceiling rose / socket outlet for bell push, where no ceiling rose / socket outlet its provided.

The following shall be deemed to be included in the point wiring

- a) Switch and ceiling rose are required
- b) In case of wall brackets, bulk head fittings, cables as required up to the lamp holders]
- c) Bushed conduit for porcelain tubing where cables pass through walls.
- d) All wood or metal blocks, boards and boxes, R.J. Boxes sunks or surface type including those required for fan regulator but excluding those under the distribution board and main control switch.
- e) Earth wire from 3 pin socket point to the common earth including connection to the earth dolly.
- f) Earth wire of 16SWG/14 SWG/I.G. wire for loop earthing of the fixture
- g) All fixing accessories such as clips, nails, screw, plug, rawl plug, wooden plug, round blocks etc. as required
- h) Joint for junction boxes and connecting the same as required
- i) Connections to ceiling rose or connection socket outlet, lamp holders, switch, fan regulators etc

The point wiring in case of fan and light points shall mean the distance between the control switch and ceiling rose, connect or back plate, socket outlet or lamp holder depending upon the fittings measured along the runs of wiring irrespective of the number of wires in run. In the case of socket outlet points, the length shall mean the distance between the socket outlet and the tapping point of live wire on the nearest switchboard or junction box, as the case may be.

In the case of exclusive socket outlet circuits wired on 'Joint Box' system of wiring, any junction provided for extending the wiring beyond the point referred to, shall be treated as the nearest tapping point. In case of call bell / buzzer points the length shall mean the distance between the call bell and the ceiling rose / socket outlet or the bell push (when the ceiling rose / socket outlet is not used).

Sub main shall include the earth wire of adequate size main distribution Board up to sub distribution board B.B. such wiring has been classified on the basis of length. For the internal lighting, either surface conduct wiring system or recessed conduit or batten wiring system shall be provided as specific in the bill of quantities and working drawings.

LED LIGHTS

1. LED light distribution pattern, illuminance, Luminous flux, chromaticity, color temperature, color rendering Index to applicable standard Lm79 & Lm80.
2. LED lights should be as per standards IEC EN 60598 and IEC61547.
3. LED luminaries should in function in a temperature raise -30°C + 60°C under 95% relative humidity condition to simulate adverse operating environment.
4. The LED produces should meet safety standards as per EN60598, EMC/EMI standard as per EN611547/EN 55015 and EN61000-3-2 and 61000-3-3 for Harmonics.
5. The electronic driver should work in the short circuit and open circuit conditions and should work in the voltage range 90V to 3000 volts.
6. LED lighting fixtures should be manufactures with LEDs of on only reputed makes such as Cree, Samsung, Lumiled osram and other equivalent.
7. The officer-in-charge has reserve the right to inspect and tested the quality in Govt. laboratory to ensure technical qualifications to meet the requirements.
8. LED lights no toxic materials U V and IR spectrum protects insect life.
9. It should be manufacture with dia-cast aluminium with required colour as per manufacture for released months.
10. The LED lights Should function 90 to 380V, 50/60 Hz, PF-Z0.9 (230V AC), Copper temp-3000K/4000K/ 6000K/ operation temperature - 20°C + 50°C in-gross protection-IP 20, lifespan 30000hrs.

A.C. Machine

The tenders should furnish following documents in cover-1.

1. Detail drawing and design.
2. Technical specification as per manufactures norms supp.
3. Detail of equipments and material supplied.
4. Make, model with individual price may be furnished.
5. All the materials and equipments must be confirming to ISI.

Lighting arrester

Supply, Installation, Testing and Commissioning of Copper Plate Earthing (600x600x3mm)with running Copper Flat 25x5mm from copper plate to funnel of 40mm dia GI PIPE heavy duty with including all accessories, excavation of earth and providing masonry work with cover plate having locking arrangement and and , charcoal, salt , funnel , tinned brass bolt, check nut and washer complete in all respect as per Direction of Engineering -in-Charge.

ABB optimised pluse rod 30 ESE Terminal & mounting mast or pole (2meter) mounting MAST (3Meter) with gay wire and base plate.

D.G. Set

DG set should be capable of running continuously for unlimited hours in a year, stopping required only for service duration.

Diesel Engine

Duty : Continuous running

Type: 4Stroke, Turbo Charged, aftercooled

Capacity: 32 Liter.

Cooling: Radiator

Governing: Full electronic

Fuel injection: Electronic Unit injectors

Alternator :

Rating: 1010 KVA/808 KW at 415 volt, 0.8pf, 50Hz, 3phase, 4wire@1500rpm.

Duty: Continuous running

Type: Self excited, self regulated, single bearing, IP-23

Efficiency:92%

- Above engine alternator should be assembled on a steel fabricated common base frame.
- Five sided Acoustic enclosure would be required to reduce noise.
- 990 L fuel tank would be placed outside acoustic enclosure.
- 2Nos. 12Volt, 180AH reputed make batteries.
- Set of Antivibration mountings.
- First fill of engine oil.
- Heavy duty silencer.

Design Criteria

The generator asset meets transient response and block loading steps as per ISO 8528-5

Single-Source Supplier

Fully prototype testes with torsional analysis.

Conduit wiring

For recessed conduit wiring system the conduit shall be placed in the ceiling / columns etc. before the casting of the slab or column. The conduit pipes shall be properly positioned and fixed so that it will not be displaced at the time of concreting. The junction boxes provided shall be so arranged that its cover will be flushed with the finished surface of the ceiling or column.

For placing the conduits in the walls, chases of ample dimension shall be made neatly to fix the conduit in a desired manner. The conduit pipe shall be fixed by means of staple or saddles not more than 600mm apart. Fixing of standard bends or elbows shall be avoided and all curves maintained by bending the conduit itself with a long radius will permit easy drawing of the conductors. Suitable inspection boxes shall be provided to permit periodical inspection and removal or replacement of wires if necessary. There shall be mounted flush with the wall with holes in the cover of the box.

The switch or regulator box shall be made of metal on all sides except on the front where backlight sheet or Perspex cover painted to match the colours of the wall shall be used in case of surface wiring system. For recessed wiring system, these boxes shall be made flush with the conduit of each conduit or section shall be completed before conductors are drawn in. The entire system of conduit after installation shall be tested for mechanical strength and electrical continuity throughout the earthing of the entire installation shall be carried out in accordance with I.E. Rules and standards. The number of wires drawn in the conduits shall not exceed the numbers those specified in Indian standard specification No.732.

Main and Sub distribution Boards:

The position of main boards for lighting and sub distribution board for different buildings are approximate and the exact location shall be given to the successful tenderer at the time of installation. The scope of this specification includes installation of the panel boards and distribution boards and making necessary connections. The installation of the boards shall be done strictly in accordance with the details supplied with the specifications; the instructions supplied by the switchgear manufacturer, Indian standard specifications and H.E. rules. The supplier shall submit the details of installations to the purchaser for his consideration and approval, prior to installation.

When the switchboards are wall / column mounted top, they shall, be mounted on a suitable angle iron framework. All the metal supports etc. shall be protected against corrosion. The mounting height for such switchboards shall be such that it can be conveniently operated.

Earthing

Earthing shall generally be carried out in accordance with the requirements of Indian Electricity Rules and the relevant rules and regulations of electrical supply authorities. The complete earthing work for the installation covered by this specifications shall also be provided taking into account Indian Standard

Specification No.IS:732 and IS:3043. The earthing system adopted shall also have adequate mechanical strength.

The work shall include earthing of non-current carrying metallic parts of all the equipment, light fittings, conduit pipes, cable and cable supports and earth strips (the design to be approved by the purchaser) and all the inter connection between the earthing system to a value mutually agreed upon\ between the purchasers and the supplier.

Installation, testing and Commissioning:

The supplier shall be responsible for the installation testing the commissioning of all the equipment and materials supplied by him against this specification. This shall also include the provision of miscellaneous wiring and supports and earthing in compliance with Indian Electricity rules and to the full satisfaction of the Government Electrical Inspector. All small items such as clamps, bolts, nuts, racks, supports, miscellaneous wiring etc. required to make the installation complete, shall constitute the part of major items specified in the bill of quantities and the tenderer should quote for each item taking these into consideration.

The responsibility of the supplier shall include receiving all the equipment and materials at site, storage for required period, handling the same at the site of erection, final execution , erections, revisions of equipment, if any, testing and commissioning and handing over the installation complete in all respect to the entire satisfaction of the purchaser's authorized representative. The supplier shall make good of all the damaged equipment and materials during this period at his own expense. The supplier shall submit sample of each and every equipment and materials for the final approval of the purchaser's representatives immediately after the acceptance of offer. All the equipments and materials shall be supplied exactly as per to the approved samples. If at any stage the purchaser brings to the notice of the supplier any discrepancy or defect the supplier shall replace the same at his own expense.

The supplier shall render all reasonable assistance to the purchaser in getting the installation approved by the Government Electrical Inspector prior to the energisation and supply necessary drawings, test certificates and both for tests carried out at the factory and site as well as the tests which the inspector may demand. In case any addition of alternations are required, to be made in the installation or in the equipment as per the directive of the Government Electrical Inspector / Local Authorities, the same will have to be carried out by the supplier , at his own expense.

The position of light fittings, main board, switches, sockets and routes of pipes and cables shown in the drawings are only indicative. The actual position of these shall be decided at site at the time of execution jointly by the supplier and the purchaser's authorized representative. The position of light fittings, pipes and board if required, to be changed / shifted due to the change in the building design etc by the purchaser's authorized representative, the same shall be carried out at no extra cost.

All the materials supplied to the contractor according to the Contract condition will be subject to inspection and approval of the officer or his representative from time to time. The contractor will provide all facilities of such inspections free of cost. At the time of inspection, the owner or his representative will have full liberty to reject any such materials, which does not conform to the specification / requirement. No claim for any rejected materials will be entertained by the owner. The contractor will remove all rejected materials from site at his own cost. No surplus materials procured by the contractor will be accepted by the owner. The contractor will be responsible to get the Electric installations cleared by the Electrical Inspector of Odisha Government. Only the inspection fee will be reimbursed by Department on production of challan copy.

Installation and Maintenance Tools:

The supplier along with the tender shall furnish a complete list of tools, appliances and accessories required for the installations of switch gear, light fittings, pipes cables and wires.

Drawings:

All drawings, test certificates, instructions manuals etc. shall be in English Language and all dimensions and weights shall be in metric units.

The tenderer shall submit with the tender general arrangement drawings for the installations work, typical methods and cabling and cables supports pipe work and pipe supports, typical methods of earthing and fixing of light fittings earthing etc. as offered by him in the tender.

The contractor shall submit for the purchaser's approval all layout, the general arrangement drawings as well as the typical details of all types of installation work in three sets before commencing the manufacture and the site installations work well in advance so that the site work shall not suffer.

After obtaining approval of the above drawings the contractor shall supply three sets of the following drawings:

- (a) The arrangement and support of conduit pipe
- (b) The position of light fittings, switches / plug socket and switch boards
- (c) Earthing installations
- (d) Layout plan showing the entire cable network

On completion of work, the successful tenderer shall supply one set of tracing in transparent linen and five sets of prints of all drawings incorporating all the changes / modifications affected during the execution of the contract. All wiring diagrams shall indicate clearly, the switch board, the runs of main and sub main wiring and the position of all the points with their controls. All the circuits shall be clearly indicated and numbered in accordance with IS:375. The technical literatures and operating instructions and the maintenance manuals shall also be supplied in triplicate to the purchasers after the completion of the installations work.

Test:

Manufactures standard tests in accordance with Indian Standard and other standards, adopted shall be carried out on all the equipment and accessories covered by this specification so as to ensure efficient and satisfactory performances of all the components and also the equipment as a whole under working conditions at site. The tenderer shall submit a complete list of all such tests. If the purchaser, if so desired for special tests, to be carried out, under certain conditions the same shall be made by the successful tenderer at his own expenses. All equipment shall be tested at site before the commissioning in accordance with the adopted standard and Indian Electricity Rules. Voltage test shall be carried out on each circuit on completion of wiring and cabling.

Technical Data:

The tenderers shall submit with their tender all such technical data, which are required for complete evaluation of the equipment offered. The suppliers shall give complete technical information of the equipment as detailed in Annexure and relevant Indian standards. The tenderer should supply such details of all equipment and materials offered specially with regard to the following.

- a) Fuse switch board and distribution boards
- b) Light fittings
- c) Conduits and the accessories for them
- d) Switches / plug sockets
- e) Cable and wires

The tender shall give along with his tender the following details:

- a) Complete details of earthing electrodes, earthing station and earthing conductors
- b) Details of conduit supports
- c) Details of all the equipment and accessories to be supplied

Exception to Specifications:

The object of this specification is to have all tenderers quote for equivalent materials and workmanship. It is, however, understood the certain manufacturers may not be able to offer as specified in every case, where the tenderer may find it necessary to deviate from the exact letter and not the intent of the specification, he must specifically state what these deviations may be at the time he submits the tender. All deviations must be grouped in one statement. No deviations other than those includes in the tender will be permitted.

PVC insulated Cables and Wires:

For 415V Distribution system, cables of voltage grade not less than 1000V shall be used. These cables shall be heavy-duty class, PVC insulated and PVC sheathed with aluminium/ copper conductors. The wires used in the lighting installation shall be PVC insulated and PVC sheathed copper / aluminium wire in case of conduits wiring and of 660V grade. Wires of different colours shall be made use of for quick\ identification of phase wire / neutral wire etc. All cable of wires shall comply with the requirements regarding the manufacture and testing etc as specified in India Standard Specification IS: 1554 and IS:694.

The length of cables indicated in the bill of quantities and drawings are only indicative and the Successful tenderer will be paid for the exact length of cables laid at site. No joint shall be allowed in a run of cables, which can be covered by a possible drum length of cables.

Fuse switch / switch fuse shall be metalclad dust and vermin proof suitable for use under climatic conditions prevailing at site. Switch fuse / fuse switch units shall comply in general to IS:1567/4064 with regard to design and constructional / features.

The 'ON' and 'OFF' position of the switch handles shall be distinctly indicated and interlocks shall be provided to ensure that the switch cover cannot be opened unless the switch is in the 'OFF' position. Means shall, however, be provided for releasing the interlock to permit closing of switch with cover open for testing purposes. Designs with normal conventional position of switch handles, i.e. with switch handle up in the 'ON' position and down I the 'OFF' position shall be preferred. All live parts inside the switch shall be properly surrounded and inter phase barrier shall be provided.

Switch fuse / fuse switch units, distribution boards shall be provided with necessary metal fame work so that they can be mounted on wall / columns structure etc. as desired. The panel boards, shall be wall mounted type or floor mounted type as specified in the bill of quantities or drawings. Necessary supporting metal frame of approved design shall be provided for all panel boards

The arrangements of work boards shall be such that the operational handle of the top mounted switches are within the convenient of operators (about 1.2 M from the finished floor level) and proper space shall be provided for the termination of the cable in the switches provided below the bus-bars.

The bus-bars within the bus-bar chamber shall be liberally spaced for taking the riser connection. The bus bars with aluminium conductors shall be provided and PVC sleeves of different colour shall be mounted on them for easy identification, Clamped joints for taking the riser connections, instead of bolted type shall be preferred.

Two bolted type earthing terminals shall be provided on the switch boards. All individual switches shall be connected with suitable size earth wire to the main earthing terminals of the switchboard. Hanger Board and shock treatment / charts shall be supplied wherever required. At the incoming side of each pen phase, 3-neon type indicating lamps should be provided at the main board.

Switches and Plug Sockets

Switches provided for control of light points shall conform to IS:1087 and shall be rated for 5A/15A 250V

Ceiling Fans and Exhaust Fans:

Ceiling fans shall conform to Indian standard specification IS: 374-1960. The fans shall be supplied with all standard accessories like regulator and capacitors etc.

The performances rating of the propeller fans shall in accordance with stipulations of IS:2312. All fans shall be robust in design and construction and shall be supplied complete with wall brackets / clamps etc.

Fluorescent Fittings:

All fluorescent fittings supplied shall confirm in general to IS:1913 and shall be complete with all standard accessories like choke, starter and capacitor etc. The type of enclosure provided for the fittings shall be of that specified in the bill of quantities and the working drawings. The materials of construction for fittings used for outdoor installations and for use in the work anodes shall be such that they shall withstand the atmospheric condition in that area. Lamp holders used shall be fully shock proof, spring-loaded rotary type to ensure positive lamp locking. It should also be not possible to touch live parts of the lamp holder both after the lamp has been taken out and during the insertion or removal of the lamp. The starters shall be designed to give designed starting characteristics that shall promote full lamp life. Starter shall have high mechanical strength and topic proof construction. It should be incorporated with radio suppression capacitor o adequate rating and\ capacity. Power factor improvement capacitors are provided with hermetically sealed housing to ensure long and trouble fee service. Terminal soldering tango shall be provided for easy electrical connections. The capacitors in general shall confirm to IS:1569-1963 and P.F improvement up to 0.95 for twin fluorescent light fittings and 0.9 for single fluorescent light fittings is to be maintained.

The ballast provided in the fluorescent fittings shall generally be in accordance to IS:1534. The ballast should incorporate the following design features.

- i) Low working temperature
- ii) Correct pre heating current for the electrodes
- iii) Proper wave foam
- iv) Small in dimensions
- v) Correct power supply to the lamp
- vi) No hum.
- vii) Easy connection leads.

All the metal construction of the fittings shall be such that they shall:

- 1) Withstand the atmospheric condition prevailing in the area
- 2) Provide maximum mechanical protection to the tubes and fittings accessories. Assists in maximum and uniform light distribution. All fittings shall be provided complete with florescent lamps. All lamps shall confirm to IS:2418.

Incandescent Fittings:

The incandescent fittings shall be supplied strictly as per the details given in the enclosed annexure and bill of quantities, deviation if any regarding design, construction of materials should be specified clearly. All the metal parts used in construction of the fittings shall have no effect due to dust / fumes / gases likely to exist in the atmosphere. All the bolts, clamps, nuts and guard wire etc shall be galvanized. The wall fittings shall be provided with necessary hooks / clamps / supports etc for fixing the light fittings on wall / ceiling etc as detailed in the bill of quantities and the working drawings. Light fittings shall be suitable for connection with 19mm dia. Conduit pipe as required. If fittings are to be connected through PVC cables, glands of

adequate size and capacity shall be provided. The lamp holders provided in the fittings shall confirm to IS:1528.

C O D E S

Codes shall mean the following including the latest ascendants and / or replacement if any.

- a) Indian Boiler Act, 1923 and Rules and Regulations made there under
- b) Indian Electricity Act, 1923 and Rules and Regulations made there under
- c) Indian Factories Act, 1948 and Rules and Regulations made there under
- d) The minimum wages Act
- e) The Women's Compensation Act
- f) The Payment of Wages Act
- g) The Fatal Accident Act
- h) The Industrial Employment Act
- i) The Employment provident Fund Act
- j) Indian Explosive Act 1984 the Rules and Regulations made there under
- k) Indian Petroleum Act 1934, and Rules and Regulations made there under
- l) A.S.M.E. Test Codes
- m) AIRE Test, Codes
- n) American Society of Materials Testing Codes
- o) Standards of the Indian Standards Institution
 - 1) Low Tension Circuit Breakers : IS 2516-1955 Part I Sec.1
 - 2) Switchgear Bus Bars IS 375-1963
 - 3) HRC fuse links IS 2208-1962
 - 4) Distribution fuse boards IS2675-1966
 - 5) Enclosure for Low Voltage switchgear IS214701962
 - 6) PVC Cables IS1554-1975
 - 7) Tubular fluorescent lamps for Cameral lighting service IS2418-1963
 - 8) Tungsten Filament Lamps for cameral service IS415-1963
 - 9) Ceiling Fans IS274-1966
 - 10) Flood lights IS1947-1961
 - 11) Wall Glass flame-proof electric light fittings IS2206-1962 (Part 1)
 - 12) Water Tight Electric Light Fittings IS3553-1956
 - 13) Steel Boxes for Enclosure of Electrical Accessories IS5133-1969
 - 14) Fittings for Rigid Steel conduit IS2667-1979
 - 15) Rigid steel circuits for electrical wiring IS3837-1966
 - 16) Accessories for Rigid Steel Conduits for Electrical Wiring IS3837-1966
 - 17) Switch Socket Outlets IS3837-1966
 - 18) PVC Wiring IS694-1977
 - 19) Switches for domestic and similar purpose IS3854-1966
 - 20) PVC wiring IS694-1977
 - 21) Call Bell and Buzzers IS2268-1966
 - 22) Straight through joint boxes and leads sleeves or paper insulated cables- EID-0032-1964
 - 23) Earthing IS3043-1966
 - 24) Electrical Wiring installations IS732-1963
 - 25) Switchgear IS3072-1965 (Part I)
 - 26) Lighting protection IS2309 –1969
 - 27) Public Address system IS1882-1962
 - 28) Low Tension switch use units IS4064-1978
 - 29) Code of Practice for Automatic FIRE ALAM system IS2189-1970
 - 30) Specification for Heat Sensitive Fire Detectors IS2175-1977
 - 31) Guide for Safety procedure in Electric work IS5216-1969
 - 32) Rubber Mats for Electric works IS5424-1969
- p) Other internationally approved standards and / or Rules and Regulations touching the subject matter of the contract.

CHAPTER IV

QUALITY CONTROL

QUALITY ASSURANCE, CONTROL AND QUALITY MONITORING

It shall be the responsibility of the Contractor to ensure the quality of the materials to be used, quality of works to be executed as well as the quality of finished product as per technical specification in accordance with Indian Standards.

Contractor shall establish and maintain field laboratory suitably placed inside the Project area (including suitable building, furniture and equipment) at his own cost and conduct different quality control test on construction material, process control test on construction & quality control monitoring test on finished products. He shall appoint qualified & experienced technical staff as per requirement to conduct tests. Equipment as necessary to conduct the tests shall be procured by the contractor. A list indicating some of the main equipment are given below for reference of the Contractors. The Contractor shall also procure other equipment, if necessary, to conduct tests specified for different items of work to the satisfaction of the Project Manager.

Sl. No.	Name of Equipment	Quantity for each Road
i.	Post Hole Auger with extension	One Set
ii.	Digging tools like pick axe, shovel, hammer, chisel, etc	One Set
iii.	) IS Sieves with lid and pan (90 mm, 80mm, 63mm, 53mm, 45mm, 37.5mm, 26.5mm, 19mm, 13.2 mm, 11.2mm, 9.5mm, 4.75mm, 2.8mm, 5.6mm, 3.35mm, 2.36mm, 600 micron, 425 micron, 300 micron, 150 micron, 180 micron, 90 micron and 75 micron)	One Set
iv.	Standard Proctor Density Test Apparatus with rammer	One Set
v.	Sand Pouring Cylinder with tray complete for field density test	One Set
vi.	Core Cutter (100 mm dia) 100mm/150mm height complete with dolly and hammer	One Set
vii.	Speedy moisture meter complete with chemicals	One Set
viii.	Straight Edges	Two Nos
ix.	Digital Thermometers	Three Nos
x.	Liquid Limit and plastic limit testing apparatus complete with Water bottle and glass wares	One Set
xi.	Gas burner, sand bath	One Set
xii.	Chamber Board	
xiii.	Electronic / digital balance 1 kg with the least count of 0.01 gm.	One No.
xiv.	Electronic / digital balance 20 kg	One No.
xv.	Pan balance with weight Box, 5 kg	One No.
xvi.	Oven (ambient to 200°C)	One No.
xvii.	Water bath (ambient to 100°C)	One No.
xviii.	Bitumen extraction apparatus	One No.
xix.	Penetration apparatus (Bitumen)	One No.

xx.	Enameled tray	Six Nos
xxi.	Measuring tape, spatula, glassware, porcelain dish, pestle mortar.	One Set
xxii.	Trays for measurement of tack coat quantity	Three Nos
xxiii.	Slump cone	Two Nos
xxiv.	Cube mould (150mmx150 mm x 150 mm)	Twelve Nos

The key equipments for field laboratory shall be:

4.1 QUALITY ASSURANCE PLAN

The Contractor shall, within fourteen (14) days from the Commencement Date, submit a Quality Assurance Plan. The plan shall include methodology & sequence of operation, list of materials sources, Quality Assurance & Quality control procedure to be followed prior to commencement of work and during execution, testing schedule showing test to be conducted and their frequencies & testing of end product, with respect to procedure laid down in different Indian Standards for each item of work & internal organisation ensuring good quality of constructions works, procedures for supplying of suitable materials, procedures for verification of drawings and other items as required by the Project Manager. The Contractor shall implement the quality control procedures in compliance with the approved Quality Assurance Plan.

4.2 SUPERVISION

Supervision of construction work will be done by **Superintending Engineer ,Quality Assurance Division, Bhawanipatna.**

4.3 MATERIALS AND SAMPLES

The Contractor shall submit to the Project Manager a list of all suppliers of manufactured items from whom he proposes to purchase, and the locations of quarries, material sources from which he proposes to extract material aggregates, stones, fill materials etc. If the contractor is purchasing the aggregates from the vendor he should obtain the material from the licensed quarry where the Orissa Pollution Control Board has given Consent for Establishment and Operation for the crusher. In addition the Contractor should enclose a copy of the Consent for establishment and operation as part of the Vendor approval. All materials and articles shall, whether specified or otherwise, be suitable for the use intended and shall be approved by the Project Manager. Samples of all materials or articles to be incorporated in the Works as may be called for by the Project Manager or his Representative shall be submitted as and when required for retention by the Project Manager's Representative. Manufacturer's test certificates shall be supplied in respect of cement, steel, pipes, etc.

The Contractor shall maintain a detailed record of all materials delivered to his stores or working areas, and shall make these records available to the Project Manager's representative. All goods and materials used in the Permanent Works shall be new, unused, of the most recent or current models, and incorporate all recent improvements in design and materials unless provided otherwise in the Contract.

All materials and works rejected by the Project Manager's representative shall be promptly removed from the site.

4.4 INSPECTION AND TESTS

All materials and goods furnished and works performed under these specifications shall be subject to the inspection of the Project Manager or his authorized representative to determine that they meet the requirements of these specifications. The Contractor shall notify the Project Manager, not less than 15 days in advance of the date and place that the materials will be available for inspection. Acceptance of materials or the waiving of inspection, thereof, shall not relieve the Contractor of the responsibility for furnishing materials and goods or performing works in accordance with the requirements of the Contract Documents.

The Contractor shall conduct different approval test in Government approved Testing Laboratories prior to utilisation in the work.

The Contractor shall be responsible for delivering all samples to the laboratory and for collecting the results. The original test certificates shall be presented to the Project Manager for his review and approval.

The Contractor shall conduct quality control test on construction material, process control test on construction & quality control monitoring test on finished products in Q.C Field Laboratory with respect to procedures & frequencies laid down in different Indian Standards for each item of work.

The Contractor shall maintain quality control test registers made out of approved test formats of all tests & abstract submitted to Project Manager regularly.

Contractor shall maintain guard file & document all test results of approval test of construction materials conducted in government approved Q.C. Testing laboratory, & abstract submitted to Project Manager regularly.

The Contractor shall facilitate inspection & verification of testing, documentation of test result to the Project Manager or his authorized representative (Asst. engineer, Junior Engineer & supporting testing staff) to ascertain, the work has been executed as per approved Technical Specification.

The Contractor shall facilitate State Quality Monitors (appointed by D.O.W.R) & higher authorities of Project to inspect & conduct verification testing as and when required to ascertain the materials used in the work & the end products are of prescribed standards.

The Contractor shall submit all the original quality control Test registers & guard file containing approval test results of materials to the Project Manager for record after completion of the work.

4.5 PROFORMA FOR OK REGISTER FOR QC

QUALITY CONTROL ARRANGEMENT.

a)	Person in-charge of QC.			
	Name			
	Designation			
	Base Lab			
	Name / Location of Base Lab			
b)	QC register /OK Card Produced		Yes	No
	Maintained properly		Yes	No
c)	Field Laboratory			
	Set Up		Yes	No
	Maintained by			

4.5.1 Borrow Area :

Location		Km. from site	
Approved		Yes	No
Soil tested		Yes	No
Test Laboratory			
(Name / Location)			
Results pasted in QC Register		Yes	No

4.5.2 Drawing and Specifications:

Approved/ Working			
Drawing available at site		Yes	No
Specification available at site		Yes	No

4.5.3 During Inspection:

a) Earthwork was done in my presence from RD _____ to _____

☐ Yes ☐ No

b) I am satisfied/ not satisfied (state details if not satisfied) that proper procedure has been followed in the above work.

CONTRACTOR

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Earth from approved borrow area has been stacked suitably and there is no excess earth.

4.5.4 Field moisture content of stacked earth

%

OMC

%

Type of spreading equipment

Earth was properly spread to _____ mm

Type of watering equipment

Type of compacting equipment

No. of passes

Field Dry Density

Percentage of compaction

Extra passes

Final Dry Density

Final percentage of compaction

Entered in QC register and OK Card.

	Yes		No

CHECKLIST FOR CONCRETE

Drawing & Specification:

Drawing and Specifications:

	Approved/ Working				
	Approved by				
	Specification available at site		Yes		No

Reinforcement grade of steel :

Fine aggregate Quality :

Water Quality :

Coarse aggregate Quality :

Cement grade :

Minimum cement in Kg/cum. :

Maximum cement in Kg./cum. :

Admixture quality :

4.5.5 Arrangement :

Safety of centering and shuttering

Stand by equipments :

Lightning arrangement :

Stand by vehicle for emergency

Compressor/ Green cut arrangement

Curing Arrangement

	Yes		No
	Yes		No
	Yes		No
	Yes		No
	Yes		No
	Yes		No

4.5.6 Tests conducted :

Cement

Reinforcement

Course Aggregate

Fine Aggregate

Water

Design Mix done

Laboratory where mix design done

Cube tests and their results

	Yes		No
	Yes		No
	Yes		No
	Yes		No
	Yes		No
	Yes		No
	OK		Not

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4.5.7 Field test conducted during inspection/
observation :

Grading of coarse aggregate

Grading of fine aggregate

Silt content of sand

Bulkage of sand

Type of Cement

Date of manufacture of cement

Observed slump

Sample of concrete

Sample No. of cubes

Weight of cement used per Batch

Weight of Coarse aggregate

Weight of Fine aggregate

Quality of water

Grade of steel used

Spacing as per drawing

Cover OK

Laps OK

Walk way provided

Status of old concrete OK

Status of cube test results OK

Non destructive test required

Recording in QC register

☐	Yes	☐	No
☐	Yes	☐	No
☐	Yes	☐	No
☐	Yes	☐	No
☐	Yes	☐	No
☐	Taken	☐	No
☐	Kg.		
☐	Kg.		
☐	Kg.		
☐	Kg.		
☐	Yes	☐	No
☐	Yes	☐	No
☐	Yes	☐	No
☐	Yes	☐	No
☐	Yes	☐	No
☐	Yes	☐	No
☐	Yes	☐	No
☐	Yes	☐	No

4.6 CHECKLIST FOR ROAD WORKS

4.6.1 Pre-construction Tests:

Soil Tested

Type of soil

Liquid Limit

CBR value Tested

Borrow area specified

Availability of test report

Recorded in QC register

Density of soil

☐	Yes	☐	No
☐	Yes	☐	No
☐	Yes	☐	No
☐	Yes	☐	No
☐	Yes	☐	No

Test Laboratory

(Name/ Location)

OMC

MDD

Suitability

☐	Yes	☐	No

4.6.2 Test during Inspection:

Thickness of layer OK

Moisture content

MDD

Percentage of compaction

Profile of Road OK

Recording in QC register

☐	Yes	☐	No
☐	Yes	☐	No
☐	Yes	☐	No
☐	OK	☐	No
☐	Yes	☐	No
☐	Yes	☐	No

4.7 Granular Sub-base:

4.7.1 Pre-construction Tests:

Test of moorum& soil admixture

☐	Yes	☐	No
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CONTRACTOR

SUPERINTENDING ENGINEER

Proportion of admixture
Liquid limit
CBR value Tested
P.I.
OMC
MDD
Grading
Tested at Lab.
Test results available at site

	Yes		No
	OK		Not
	Govt.		Private
	Yes		No.

4.7.2 Test during Inspection :

Thickness of layer OK
Grading
OMC
MDD
Percentage of compaction
Profile of Road OK
Recording in QC register

	Yes		No
	OK		Not
	OK		Not
	Yes		No
	Yes		No

4.8 W.B.M. items :

4.8.1 Tests in Base Lab :

Physical properties of coarse aggregate
Grading of coarse aggregates
Screening material
Liquid Limit of Screening materials
P.I. of screening materials
% finer to 75 micron sieve for screening materials
Tested at Lab
Test results available at site

	Yes		No
	Yes		No
	Yes		No
	Govt.		Private
	Yes		No

4.8.2 Test during inspection :

Thickness of layer OK
Grading of coarse aggregate
Grading of screening OK
Profile of Road OK
Surface irregularly OK
% finer to 75 micron sieve
Recorded in QC register

	Yes		No
	OK		Not
	Yes		No
	Yes		No
	Yes		No
	Yes		No

4.9 Bituminous items :

4.9.1 Test in Base Lab :

Physical properties of coarse aggregate
Grading of coarse aggregate
Properties of bitumen/Emulsion
Test results available at site
Test conducted at laboratory

	Yes		No
	Yes		No
	Yes		No
	Yes		No
	Govt.		Private

4.9.2 Test during inspection :

Bitumen/Emulsion content in
Prime coat/ tack coat/ seal coat/ PMC
Mixing temperature
Laying temperature
Thickness of layer
Profile of Road OK
Surface irregularity OK
Grading of coarse aggregate

	Yes		No
	Yes		No
	Yes		No

CONTRACTOR

SUPERINTENDING ENGINEER

	Record in QC register	☐	Yes	☐	No
4.10	Quality supervision				
	Arrangement during execution OK.	☐	Yes	☐	No
4.11	Quality monitoring arrangement OK	☐	Yes	☐	No
4.12	Rectification and compliance to defects	☐	Yes	☐	No
4.13	Suggestion for improvement to be recorded in				
	QC register	☐	Yes	☐	No

CHAPTER V

BILL OF QUANTITY

BILL OF QUANTITY

Name of work :- “ **Construction of Toilet Room at Division Office Building under UI Left canal Division No I, Kusumkhunti.**”

Name of the Bidder :

Percentage : Excess/Less

Sl.No.	Description of Items	Unit	Quantity	Rate	Amount
1	2	3	4	5	6
1	Earth work Excavation in hard soil or gravelly soil within 50m, initial lead & 1.50m, initial lift including rough dress-ing and breaking clouds to maximum 5 cm to 7cm and laying in layers not exceeding 0.30m in depth and as per direction of the Engineer in charge.	Cum	34.480	210.50	7258.04
2	Filling foundation and plinth with sand including watering and ramming with cost, carriage, royalty etc. complete and as per direction of Engineer in- charge.	Cum	4.750	588.00	2793.00
3	Cement concrete (1:3:6) with 20mm size H.g.c.b Chips of approved quality free from skin materials ,mixing by Concrete mixer including hoisting ,lowering and laying the Concrete in position to proper slope ,level and compacting by Vibrator in layers not exceeding 0.15m depth and finishing the exposed surface smooth including watering and curing for required period cost ,conveyance ,hire and running charges of all machineries ,royalty and other taxes of all T & P materials ,labours are required for this item etc. complete as directed by Engineer-in-Charge.	Cum	2.610	6102.80	15928.31
4	Providing straightening, Cutting, bending, binding, fitting and placing uncoated HYSD bar reinforcement and laying in position including cost of binding wire 18mm to 20mm gauge and fixing of reinforcement including lapping (as per steel code) where necess	Qntl	20.310	9460.70	192146.82
5	Providing formwork for concrete with F1 finish for up stream faces of dam, spilling, glacis of barrages un exposed surfaces of foundation, block joints etc. with steel shutters rigidly fixed and removal of forms and making good to the surfaces where neces	Sqm	91.820	817.60	75072.03
6	Reinforced Cement concrete Grade M20 with 20mm down graded hard granite crusher broken chips of approved quality free from skin materials mixing by concrete mixer including hoisting lowering and laying the concrete in position to proper slope, level and	Cum	12.950	5772.10	74748.70
7	Brick work with K.B. bricks 23 cm x 11 cm x 8 cm size having crushing strength not less than 75 Kg/Cm2 with dimensional tolerance +- 8% in cement mortar (1:6) in foundation and plinth.	Cum	16.650	8779.55	146179.51
8	12mm thick cement plaster (1 : 6) for brick work with all cost, carriage, Royalty, T & P etc complete as per direction of Engineer-in-Charge.	Sqm	144.260	277.60	40046.58
9	Fixing Ceramic tiles (30CmX30Cm) in floors treads or steps and landing on 25mm thick bed of cement mortar 1 : 1 (1Cement : 1 Sand) jointed with neat cement slury mixed with pigment to match the sha-des of the tiles including rubbing and polishing comple	Sqm	16.100	1348.50	21710.85
10	Fixing Ceramic tiles (Wall tiles) (20cmx30cm / 20CmX20Cm) in dados /Wall / skirting and riser of steps on 12mm thick bed of cement mortar 1 : 3 (1Cement : 3 Sand) jointed with neat cement slury mixed with pigment to match the sha-des of the tiles includ	Sqm	46.980	1511.50	71010.27

CONTRACTOR

SUPERINTENDING ENGINEER

11	Finishing surface of walls with cement based wall putty (water based) of approved make and finished smooth and even surface to receive painting cost of scaffolding staging charges with cost of materials, labour, T&P etc. complete and as per the direction	Sqm	97.480	115.80	11288.18
12	Filling foundation and plinth with excavated materials including watering and ramming etc complete and as per direction of Engineer-in-Charge.	Cum	11.490	117.00	1344.33
13	White washing two coat with Shell lime on new plaster surface including cost of material , Labour, T & P etc. complete as per direction of Engineer-in-Charge.	Sqm	97.480	12.00	1169.76
14	Wall painting two coat with Plastic emulsion Paint of approved shade on old work to give an even shade including cost of paint etc. complete as per direction of Engineer-in-Charge.	Sqm	97.480	110.30	10752.04
15	Supplying all materials, labour, T & P for providing fitting & fixing of pipe line for Toilet, Bathroom etc. for covering the connection etc. all complete. (as per quotation total quantity rate) 25mm UPVC pipe (10 ft.)	No	28.000	435.00	12180.00
16	25mm UPVC socket	Nos.	32.000	95.00	3040.00
17	15mm UPVC pipe (10 ft.)	Nos.	10.000	210.00	2100.00
18	15mm UPVC Socket	Nos.	10.000	52.00	520.00
19	25mm Jam Nut	Nos.	3.000	150.00	450.00
20	25mm PVC Union	Nos.	1.000	242.00	242.00
21	25mm PVC bal valve	Nos.	1.000	334.00	334.00
22	25mm PVC elbow	Nos.	50.000	90.00	4500.00
23	15mm PVC elbow	Nos.	10.000	50.00	500.00
24	25mm PVC tee	Nos.	20.000	100.00	2000.00
25	25mm brass tee	Nos.	10.000	200.00	2000.00
26	15mm brass screw down BIB cock	Nos.	15.000	1350.00	20250.00
27	25mm kaju clip	Nos.	100.000	45.00	4500.00
28	Basin set	Nos.	5.000	3500.00	17500.00
29	Basin bracket	Set	5.000	180.00	900.00
30	Waste coupling	Nos.	5.000	100.00	500.00
31	Wash pipe	Nos.	5.000	155.00	775.00
32	110mm SWR pipe	RM	33.000	460.00	15180.00
33	110mm SWR tee	Nos.	5.000	200.00	1000.00
34	110mm SWR elbow	Nos.	20.000	162.00	3240.00
35	Ladies Urinal	Nos.	3.000	1730.00	5190.00
36	Gents Urinal	Nos.	3.000	1705.00	5115.00
37	Western Toilet set	Nos.	3.000	22050.00	66150.00
38	10 ltr. PVC flushing cistern	Nos.	3.000	2360.00	7080.00
39	6 x 3 ft. aluminium door	Nos.	4.000	23000.00	92000.00
40	1000 l water tank	Nos.	2.000	15000.00	30000.00
41	250ml UPVC solvent cement	Nos.	3.000	460.00	1380.00
42	Teflon tap	Nos.	15.000	40.00	600.00
43	Supplying all materials, labour, T & P for providing fitting & installation of electricals items etc. all complete as per	Nos.	70.000	55.00	3850.00

CONTRACTOR

SUPERINTENDING ENGINEER

	EIC. (as per quotation total quantity rate) 1" PVC Pipe 45kg				
44	1" HMS PIPE HEAVY	Nos.	20.000	70.00	1400.00
45	1" BEND YELLOW	Nos.	50.000	30.00	1500.00
46	1" BEND WHITE	Nos.	20.000	30.00	600.00
47	1" JUNCTION BOX 3WAY	Nos.	20.000	25.00	500.00
48	1" JUNCTION BOX 2WAY	Nos.	20.000	25.00	500.00
49	1" JUNCTION BOX 4WAY	Nos.	15.000	25.00	375.00
50	1.00MM M/S WIRE	Nos.	6.000	1200.00	7200.00
51	1.50MM M/S WIRE	Nos.	20.000	1280.00	25600.00
52	2.50MM M/S WIRE	Nos.	15.000	2560.00	38400.00
53	4.00MM M/S WIRE	Nos.	14.000	3280.00	45920.00
54	12 MOD GANG BOX	Nos.	1.000	520.00	520.00
55	18 MOD METAL BOX	Nos.	1.000	380.00	380.00
56	12 MOD METAL BOX	Nos.	10.000	420.00	4200.00
57	6 MOD METAL BOX	Nos.	13.000	320.00	4160.00
58	3 MOD METAL BOX	Nos.	8.000	220.00	1760.00
59	2 MOD METAL BOX	Nos.	16.000	320.00	5120.00
60	18 MOD PLATE	Nos.	1.000	350.00	350.00
61	12 MOD PLATE	Nos.	10.000	180.00	1800.00
62	6 MOD PLATE	Nos.	14.000	175.00	2450.00
63	4 MOD PLATE	Nos.	1.000	250.00	250.00
64	3 MOD PLATE	Nos.	10.000	210.00	2100.00
65	2 MOD PLATE	Nos.	16.000	85.00	1360.00
66	16A 1 WAY SWITCH	Nos.	4.000	365.00	1460.00
67	6A 1 WAY SWITCH	Nos.	40.000	150.00	6000.00
68	32A DP SWITCH	Nos.	4.000	720.00	2880.00
69	6A 5 PIN SOCKET	Nos.	10.000	250.00	2500.00
70	16A 5 PIN SOCKET	Nos.	4.000	450.00	1800.00
71	4 STEP REGULATOR	Nos.	4.000	410.00	1640.00
72	BLANK PLATE	Nos.	12.000	32.00	384.00
73	16A MODULAR MCB	Nos.	4.000	720.00	2880.00
74	32A MODULAR MCB	Nos.	2.000	1150.00	2300.00
75	32A MCB SP	Nos.	1.000	1100.00	1100.00
76	63A MCB SP	Nos.	1.000	1220.00	1220.00
77	MCB BOX 8 WAY	Nos.	2.000	1760.00	3520.00
78	MCB BOX 4 WAY	Nos.	2.000	1680.00	3360.00
79	DOME CEILING ROSE	Nos.	10.000	35.00	350.00
80	ROUND PLATE	Nos.	16.000	45.00	720.00
81	1.5" MACHINE SCREW	Nos.	16.000	30.00	480.00
82	3/4" MACHINE SCREW	Nos.	20.000	25.00	500.00
83	1.50" BLACK SCREW	Nos.	75.000	35.00	2625.00

CONTRACTOR

SUPERINTENDING ENGINEER

84	2" BLACK SCREW	Nos.	75.000	30.00	2250.00
85	KHILA	Nos.	6.000	200.00	1200.00
86	1" FLEXIBLE PIPE	Nos.	6.000	515.00	3090.00
87	1" KAJU CLIP	KG	8.000	125.00	1000.00
88	DOWN ROD 2FT	Bundle	2.000	185.00	370.00
89	CEILING FAN 1200MM	Nos.	2.000	3200.00	6400.00
90	20WT LED BATTEN	Nos.	10.000	460.00	4600.00
91	LED LIGHT (9W)	Nos.	15.000	110.00	1650.00
92	LED STREET LIGHT (50W)	Nos.	8.000	4850.00	38800.00
	(Ninety Two items only)		TOTAL Rs.		12,16,048.41