



**GOVERNMENT OF ODISHA
DEPARTMENT OF WATER RESOURCES**

e – Procurement Notice No. DDKPD-02 of 2026-27

TENDER DOCUMENT

FOR THE WORK

**Decongestion and Desilting of drains
under Aali Constituency**

**SUPERINTENDING ENGINEER
DRAINAGE DIVISION, KENDRAPARA**

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GENERAL INFORMATION

RECORD OF SALE OF TENDER DOCUMENTS

Issued

vide receipt No.....of Book NoDated.....

1. Name of the Work : **Decongestion and Desilting of drains under Aali Constituency**
2. Tender Call Notice No. : **DDKPD – 02 of 2026-27**
3. Sl. No. of the Work : **Sl. No. 2 of DDKPD- 02 of 2026-27**
4. Starting date of issue of Tender Documents online : **Dt. 10.08.2026 at 10.00Hours**
5. Last date of receipt of Tender Documents online : **Dt. 19.08.2026**
: **Up to 17.30Hours.**
6. Cost of Tender paper : **Rs. 10,000/- to be remitted online**
7. Total No. of pages in the Tender document : **155 pages**

DETAILS OF WORKS

Decongestion and Desilting of drains under Aali Constituency

PRINCIPAL FEATURES OF THE WORK

1. GENERAL:

The work under tender pertains to the Drainage Division, Kendrapara

2. TOWNS:

The Project alignment runs through a rural stretch, which does not provide adequate market facilities to serve the day-to-day needs. The nearest town is **Aali** where moderate market facilities are available.

3. ACCESS TO SITE:

The work site is **12 Km from Aali**

4. MEDICAL AID:

The nearest Hospital / Public Health Centre are available at **Aali**.

5. POST TELEGRAM & TELEPHONE:

These facilities are available at **Aali**.

CHAPTER-I

DETAIL CALL NOTICE

**GOVERNMENT OF ODISHA
DEPARTMENT OF WATER RESOURCES**

**OFFICE OF THE SUPERINTENDING ENGINEER
DRAINAGE DIVISION, KENDRAPARA**

Invitation of Tenders

‘e’ Procurement Notice No. DDKPD-02 of 2026-27

[e-mail- eeddkendrapara@gmail.com](mailto:eeddkendrapara@gmail.com) Phone No. 9439181343

The **Superintending Engineer, Drainage Division, Kendrapara** on behalf of Hon'ble Governor of Odisha invites on-line **percentage rate tender** in **Double Cover** system through e-procurement for execution of the work mentioned below. The bid should be submitted on-line in the Government website www.tendersorissa.gov.in by eligible class of contractors as mentioned below registered with State Government & contractors of equivalent grade/ class registered with Central Government/ MES/ Railway to be eventually drawn in P1 contract form. The bidders should have necessary portal enrolment (with own digital signature certificate). The registered bidders outside of Odisha State can also participate in this on-line tender process after necessary portal enrolment but shall have to subsequently undergo registration with appropriate authority of the State Govt. within a month of acceptance of bid. The bidders registered outside the State are required to submit an under taking 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 liabilities under the Act, but the bidder has to produce GSTIN registration certificate before signing of agreement. For bidders registered within the State, no tender would be considered without a valid GSTIN registration certificate.

Bidders registered themselves under CDMS portal only can participate in the bidding process after 31.12.2020 as per works department letter no. 9100, dated 17.07.2020.

SI No	Name of the work	Amount Put to tender (Rs.)	Availability of Bid in Govt. Website	EMD required (Rs.) (Online)	Cost of Tender Paper (Rs.) (Online)	Period of Completion	Class of Contractor
1	2	3	4	5	6	7	8
1	Improvement to Gopalpur Madhyapada link drain under Doab-XIV	5741872.00	10.08.2026 to 19.08.2026	57500.00	10000.00	(Six) calendar months	B
2	Decongestion and Desilting of drains under Aali Constituency	6148679.00	10.08.2026 to 19.08.2026	61500.00	10000.00	(Six) calendar months	B
3	Decongestion and Desilting of drains under Patkura Constituency	6228960.00	10.08.2026 to 19.08.2026	62300.00	10000.00	(Six) calendar months	B
4	Decongestion and Desilting of drains under Mahakalpada Constituency	6698519.00	10.08.2026 to 19.08.2026	67000.00	10000.00	(Six) calendar months	B

SI No	Name of the work	Amount Put to tender (Rs.)	Availability of Bid in Govt. Website	EMD required (Rs.) (Online)	Cost of Tender Paper (Rs.) (Online)	Period of Completion	Class of Contractor
1	2	3	4	5	6	7	8
5	Decongestion and Desilting of drains under Rajnagar Constituency	6716246.00	10.08.2026 to 19.08.2026	67200.00	10000.00	(Six) calendar months	B
6	Renovation of Kukuni link drain of Gobari Drainage System	7769003.00	10.08.2026 to 19.08.2026	77700.00	10000.00	(Six) calendar months	B
7	Construction of FLB over Deuli Ranki DC & its link under Doab-II	8078527.00	10.08.2026 to 19.08.2026	80800.00	10000.00	(Six) calendar months	B
8	Renovation of Baramania Jore Outfalling to river Kani (Doab-XIV)	8335498.00	10.08.2026 to 19.08.2026	83400.00	10000.00	(Six) calendar months	B

2. EMD / Bid : The bidder shall transfer the required amount of EMD/Bid Security and cost of tender paper as mentioned for the specified work in coloum 5 & 6 respectively of above table by **online** through a process as mentioned in DTCN.
3. Mode of submission of Tender : Tender should be submitted on-line in www.tendersorissa.gov.in
4. Period of availability of tenders on-line / date of time of bidding on-line / last date of seeking clarification / date of opening of tender papers. : Details as follows:-

Procurement Officer	e - Procurement Notice No.	Availability of tender on-line for bidding		Date of seeking tender clarification	Date & time of opening of tender at Drainage Division, Kendrapara at Marshaghai	
		From	To		Technical Bid	Financial Bid
Superintending Engineer, Drainage Division, Kendrapara.	DDKPD – 02 of 2026-27	10.08.2026 at 10.00 Hrs.	19.08.2026 Up to 17.30 Hrs.	10.08.2026 to 19.08.2026 10:00AM to 05:30PM on working day	20.08.2026 at 11.00 AM	01.09.2026 at 11.00 AM

5. Any addendum / corrigendum /cancellation of above tender will be published in the web-site www.tendersorissa.gov.in and in the notice board. The system shall generate a mail to those bidders who have already uploaded their tenders and those bidders if they wish, can modify their tenders.
6. 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.tendersorissa.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 sale and receipt of tender papers. Interested tenderers may obtain further information at the web-site www.tendersorissa.gov.in.
7. The bid for the work shall remain open for acceptance 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 deposit at the time of submission of tender shall stand forfeited.
8. No Engineer of 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.
9. Other details including details of Portal Registration, Submission of bid, Resubmission and withdrawal of bid can be seen in the bidding document which is available in web-site www.tendersorissa.gov.in.
13. Engineer contractor desirous to avail the exemption of EMD is required to submit an affidavit to the effect that he/she has not yet availed the facility for more than two works during the current financial year. The name of work for which and the authority to whom the tenders have been submitted, must be mentioned in the affidavit & he should produce his original registration certificate at the time of opening of tender failing which the tender will be rejected.
14. The Schedule Caste/ Schedule Tribe/ Physically handicapped Contractors desirous to avail the facility of preference as per Works Deptt. should produce their original registration certificate stating the fact of Caste/ physically handicapped by their registration authority on demand by the undersigned, failing which they will not get price preference as per rule.
15. If the rate quoted by the bidder is less than 15% of the tender amount, then such a bid shall be rejected & the tender shall be finalized basing on merits of rest bids. But if more than one bid is quoted at 14.99% less than the estimated cost, the tender accepting authority will finalize the tender through a transparent Lottery system, as per Government of Odisha works Department Letter No. 12366, dated 8.11.1013 on Amendment to Appendix-IX, Clause-36 of OPWD code Vol-1
16. **THE CONTRACTOR HAS TO MENTION PERCENTAGE EXCESS OR LESS OVER THE ESTIMATED COST (IN FIGURE AND WORDS)**
 - a. The percentage rate as mentioned by the tenderer will be considered up to 2nd decimal only.
17. Additional Performance Security shall be obtained from the bidder when the bid amount is less than estimated cost put to the tender. In such an event only the successful bidder who has quoted less bid price/ rates than the estimated cost put to tender shall have to furnish the Additional Performance Security as per the following rate. Additional performance security shall

be taken on an incremental basis from the selected bidder for low bid prices in the project works as under vide Office Memorandum No.07764600022025-173/W Bhubaneswar Dt.03.01.2026.

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 is required.

II. where the bid price is below 10% but not below 20% of the project cost out 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 the 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 below 20% of the project cost put 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% or 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. Justification for abnormally low bids shall be scrutinized by the Department Technical Committee and recommended to the competent authority of the Administrative Department for the approval of the Additional Performance Security (APS). An abnormally low bid is one in which the Bid price. In combination with other elements of the Bid, appears so low that it raises material concerns as to the capability of the Bidder to perform the contract at the offered price. Procuring Entity may, in such cases, seek written clarifications from the bidder, including detailed price analyses of its Bid price in relation to scope, schedule, resource mobilization, allocation of risks and responsibilities, and any other requirements of the bid document. If, after evaluating the price analyses the procuring entity determines that the Bidder has substantially failed to demonstrate its capability to deliver the contract at the offered price, the procuring Entity may reject the Bid/Proposal. However, it would not be advisable to fix a normative percentage below the estimated cost, which would automatically be considered as an abnormally low bid.

18. 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 Superintending Engineer of the concerned Division and Divisional Accounts Officer (DAO) will remain present, vide O.M. No.07764600022025-632/W Dt.09.01.2026. The date of lottery will be contacted later on if necessary.

19. If the rate quoted by the SC and ST Category Contractors comes to the rate quoted by the L-1 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 contractors vide O.M. No.07764600022025- 632/W Dt.09.01.2026.

20. As regards the bidding process in which the tender has been floated before the issue of Works Department Office Memorandum No.173 dt.03.01.2026, the bid shall be finalized as per the earlier provisions in Appendix-IX, Clause 36 of OPWD Code Volume-II.

Other details can be seen in the bidding documents, which is available in web-site www.tendersorissa.gov.in.

Authority reserves the right to reject any or all the tenders without assigning any reasons thereof.

**Superintending Engineer,
Drainage Division, Kendrapara**

GOVERNMENT OF ODISHA

WORKS DEPARTMENT

OFFICE MEMORANDUM

No. 07764600022025 632 /W., Bhubaneswar Dt. 9.1.26

Sub- Clarification on Works Department Office Memorandum No.173 dt 03.01.2026 regarding Amendment of Codal and Contractual Provisions.

The following clarifications are issued on Works Department Office Memorandum No. 173 dated . 03.01.2026

1. The phrase " **to abolish the extant provisions of threshold negative bid caps (14.99%) introduced**" in the first para of the Works Department OM No. 173 dated. 03.01.2026 may be read as " **to abolish the extant provisions of threshold negative bid caps of 15 % introduced vide Works Department OM No. 12366/W dt. 08.11.2013 and amended vide Works Department OM No. 1437 dt, 31.01.2023**"
2. 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.
3. If the rate quoted by the SC and ST Category Contractors 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 contractors.
4. As regards the bidding process in which the tender has been floated before the issue of Works Department Office Memorandum No.173 dt 03.01.2026, the bid shall be finalized as per the earlier provisions in Appendix-IX, Clause 36 of OPWD Code Volume-II.
5. This has been concurred in by the Finance Department in File No **FIN-WF1-MISC-0102-2025**

By order of the Governor



Principal Secretary to Government

FIN-WF1-MISC-0102-2025/1/2026

Memo No. 633 /W, dated 9.1.26

Copy along with soft copy forwarded to Gazette Cell, Commerce and Transport (Commerce) Department, Bhubaneswar, for information and necessary action.

They are requested to publish the Office Memorandum in the extraordinary issue of the Gazette and supply 20 (twenty) copies to this Department.

Dec
09.01.2026

EIC-cum-Special Secretary to Government

Memo No. 634 /W., Dt. 9.1.26

Copy forwarded to the P.S. to the Hon'ble Chief Minister, Odisha for the kind information of the Hon'ble Chief Minister.

Dec
09.01.2026

EIC-cum-Special Secretary to Government

Memo No. 635 /W., Dt. 9.1.26

Copy forwarded to the P.S. to the Hon'ble Minister, Law, Works, Excise, Odisha for the kind information of the Hon'ble Minister.

Dec
09.01.2026

EIC-cum-Special Secretary to Government

Memo No. 636 /W., Dt. 9.1.26

Copy forwarded to the OSD to the Chief Secretary, Odisha, for the kind information of the Chief Secretary, Odisha.

Dec
09.01.2026

EIC-cum-Special Secretary to Government

Memo No. 637 /W., Dt. 9.1.26

Copy forwarded to Sr. P.S. to the DC-cum-ACS, Odisha, for the kind information of the DC-cum-ACS, Odisha.

Dec
09.01.2026

EIC-cum-Special Secretary to Government

FIN-WF1-MISC-0102-2025/1/2026

Memo No. 638 /W., Dt. 9.1.26

Copy forwarded to Principal Accountant General (A&E), Odisha, Bhubaneswar/ Principal Accountant General (E & SR Audit), Odisha, Puri Branch, Puri for kind information and necessary action.

Memo No. 639 /W., Dt. 9.1.26

EIC-cum-Special Secretary to Government

Copy forwarded to P.S. to the Principal Secretary to Govt., Finance Department/ H & UD Department/ Works Department for the kind information of the Principal Secretary, Finance Department/ H & UD Department/ Works Department respectively.

EIC-cum-Special Secretary to Government

Memo No. 640 /W., Dt. 9.1.26

Copy forwarded to P.S. to the Commissioner-cum-Secretary to Govt., RD Department/ PR&DW Department for the kind information of the Commissioner-cum-Secretary, RD Department/ PR&DW Department respectively.

EIC-cum-Special Secretary to Government

Memo No. 641 /W., Dt. 9.1.26

Copy forwarded to the Finance Department/ H & UD Department/ RD Department/ PR&DW Department/DoWR/ all other Departments for information and necessary action.

EIC-cum-Special Secretary to Government

Memo No. 642 /W., Dt. 9.1.26

Copy forwarded to the FA-cum-Special Secretary to Government, Works Department for kind information and necessary action.

EIC-cum-Special Secretary to Government

Memo No. 643 /W., Dt. 9.1.26

Copy forwarded to all Collectors & DMs for information and necessary action.

EIC-cum-Special Secretary to Government

FIN-WF1-MISC-0102-2025/1/2026

Memo No. / 644 /W., Dt. 2.1.26

Copy forwarded to EIC(Civil-cum-Roads), Odisha /EIC, Water Resources, Odisha/ EIC, Rural Works, Odisha/ EIC (PH), H&UD Department/ EIC (RWSS) PR&DW Department/ EIC, DPQ, Odisha/ EIC, NHs, Odisha/ EIC-cum-Managing Director, OB & CC Ltd., Bhubaneswar, Odisha/ Chief Engineer, Roads-I & II, Odisha / Chief Engineer, Buildings-I & II, Odisha / Chief Engineer, NHs, Odisha/ Chief Engineer, Bridges, Odisha / Chief Engineer, P&IP, Odisha / Chief Engineer, RD &QP, Odisha /Chief Engineer, RW-I & II, Odisha / Chief Engineer, PH (Urban), Odisha / Chief Engineer, Electricity, Odisha / Managing Director, OCC Ltd., Bhubaneswar/ all State PSUs for kind information and necessary action.

Jy 09.01.2026
EIC-cum-Special Secretary to Government

Memo No. / 645 /W., Dt. 2.1.26

Copy forwarded to DDG & State Informatics Officer, National Informatics Centre, Odisha State Centre, Bhubaneswar, Email- sio-ori@nic.in for information and necessary action.

Jy 09.01.2026
EIC-cum-Special Secretary to Government

Memo No. 646 /W., Dt. 2.1.26

Copy forwarded to the Chief Executive Officer (Administrative), Odisha Computer Application Centre(OCAC), Bhubaneswar, for information and necessary action.

Jy 09.01.2026
EIC-cum-Special Secretary to Government

Memo No. 647 /W., Dt. 2.1.26

Copy forwarded to all EICs/CEs/CCEs/ SEs/ EEs of the Works Department for kind information and necessary action.

Jy 09.01.2026
EIC-cum-Special Secretary to Government

Memo No. 648 /W., Dt. 2.1.26

Copy forwarded to Roads Section/ A/C-I Section /A/C-II Section/ Plan Section / Building Section / Budget Section / N.H. Section / FC & AA Section, Works Department for information and necessary action

Jy 09.01.2026
EIC-cum-Special Secretary to Government



FIN-WF1-MISC-0102-2025/1/2026

**GOVERNMENT OF ODISHA
WORKS DEPARTMENT**

OFFICE MEMORANDUM

No. 07764600022025 173 /W., Bhubaneswar Dt. 03/01/20

Sub:- Amendment of Codal & Contractual Provisions.

After careful observation, Government has been pleased to abolish the extant provisions of threshold negative bid caps (14.99%) introduced in Appendix-IX, Clause 36 of OPWD Code Volume-II in the procurement of works undertaken by the Govt of Odisha and its agencies to ensure the procurement process results in a viable and successful manner with adoption of following incremental **Additional Performance Security(APS)** system:

1. Additional performance security shall be taken on an incremental basis from the selected bidder for low bid prices in the project works as under:

- 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 is 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 below 20% of the project cost put 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% or 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.

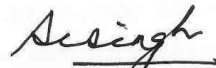
VI. Justification for abnormally low bids shall be scrutinized by the Departmental Technical Committee and recommended to the competent authority of the Administrative Department for the approval of the Additional Performance Security(APS). An abnormally low bid is one in which the Bid price, in combination with other elements of the Bid, appears so low that it raises material concerns as to the capability of the Bidder to perform the contract at the offered price. Procuring Entity may, in such cases, seek written clarifications from the Bidder, including detailed price analyses of its Bid price in relation to scope, schedule, resource mobilization, allocation of risks and responsibilities, and any other requirements of the bid document. If, after evaluating the price analyses, the procuring entity determines that the Bidder has substantially failed to demonstrate its capability to deliver the contract at the offered price, the Procuring Entity may reject the Bid/ Proposal. However, it would not be advisable to fix a normative percentage below the estimated cost, which would automatically be considered as an abnormally low bid.

2. These amendments shall take effect from the date of issue of the O.M.

3. Accordingly, the relevant existing codal/contractual provision stands modified with effect from the date of issue of this O.M.

4. This has been concurred in by the Finance Department vide **File No. FIN-WF1-MISC-0102-2025**

By order of the Governor

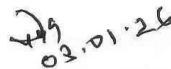


Principal Secretary to Government

Memo No. 174 /W, dated 03/01/26

Copy along with soft copy forwarded to Gazette Cell, Commerce and Transport (Commerce) Department, Bhubaneswar, for information and necessary action.

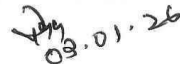
They are requested to publish the Office Memorandum in the extraordinary issue of the Gazette and supply 20 (twenty) copies to this Department.



EIC-cum-Special Secretary to Government

Memo No. 175 /W., Dt. 03/01/26

Copy forwarded to the P.S. to the Hon'ble Chief Minister, Odisha for the kind information of the Hon'ble Chief Minister.



EIC-cum-Special Secretary to Government

Memo No. 176 /W., Dt. 03/01/26

Copy forwarded to the P.S. to the Hon'ble Minister, Law, Works, Excise, Odisha for the kind information of the Hon'ble Minister.

Jh
03.01.26
EIC-cum-Special Secretary to Government

Memo No. 177 /W., Dt. 03/01/26

Copy forwarded to the OSD to the Chief Secretary, Odisha, for the kind information of the Chief Secretary, Odisha.

Jh
03.01.26
EIC-cum-Special Secretary to Government

Memo No. 178 /W., Dt. 03/01/26

Copy forwarded to Sr. P.S. to the DC-cum-ACS, Odisha, for the kind information of the DC-cum-ACS, Odisha.

Jh
03.01.26
EIC-cum-Special Secretary to Government

Memo No. 179 /W., Dt. 03/01/26

Copy forwarded to Principal Accountant General (A&E), Odisha, Bhubaneswar/ Principal Accountant General (E & SR Audit), Odisha, Puri Branch, Puri for kind information and necessary action.

Jh
03.01.26
EIC-cum-Special Secretary to Government

Memo No. 180 /W., Dt. 03/01/26

Copy forwarded to P.S. to the Principal Secretary to Govt., Finance Department/ H & UD Department for the kind information of the Principal Secretary, Finance Department/ H & UD Department respectively.

Jh
03.01.26
EIC-cum-Special Secretary to Government

Memo No. 181 /W., Dt. 03/01/26

Copy forwarded to P.S. to the Commissioner-cum-Secretary to Govt., RD Department/ PR&DW Department for the kind information of the Commissioner-cum-Secretary, RD Department/ PR&DW Department respectively..

Jh
03.01.26
EIC-cum-Special Secretary to Government

Memo No. 182 /W., Dt. 03/01/26

Copy forwarded to the Finance Department/ H & UD Department/ RD Department/ PR&DW Department/DoWR/ all other Departments for information and necessary action.

Jh
03.01.26
EIC-cum-Special Secretary to Government

Memo No. 183 /W., Dt. 03/01/26

Copy forwarded to the FA-cum-Special Secretary to Government, Works Department for kind information and necessary action.

Jy. 03.01.26

EIC-cum-Special Secretary to Government

Memo No. 184 /W., Dt. 03/01/26

Copy forwarded to all Collectors & DMs for information and necessary action.

Jy. 03.01.26

EIC-cum-Special Secretary to Government

Memo No. 185 /W., Dt. 03/01/26

Copy forwarded to EIC(Civil-cum-Roads), Odisha /EIC, Water Resources, Odisha/ EIC, Rural Works, Odisha/ EIC (PH), H&UD Department/ EIC (RWSS) PR&DW Department/ EIC, DPQ, Odisha/ EIC, NHs, Odisha/ EIC-cum-Managing Director, OB & CC Ltd., Bhubaneswar, Odisha/ Chief Engineer, Roads-I & II, Odisha / Chief Engineer, Buildings-I & II, Odisha / Chief Engineer, NHs, Odisha/ Chief Engineer, Bridges, Odisha / Chief Engineer, P&IP, Odisha / Chief Engineer, RD & QP, Odisha /Chief Engineer, RW- I & II, Odisha / Chief Engineer, PH (Urban), Odisha / Chief Engineer, Electricity, Odisha / Managing Director, OCC Ltd., Bhubaneswar/ all State PSUs for kind information and necessary action.

Jy. 03.01.26

EIC-cum-Special Secretary to Government

Memo No. 186 /W., Dt. 03/01/26

Copy forwarded to all CCEs/ SEs/ EEs of the Works Department for kind information and necessary action.

Jy. 03.01.26

EIC-cum-Special Secretary to Government

Memo No. 187 /W., Dt. 03/01/26

Copy forwarded to Roads Section/ A/C-I Section /A/C-II Section/ Plan Section / Building Section / Budget Section / N.H. Section / FC & AA Section, Works Department for information and necessary action

Jy. 03.01.26

EIC-cum-Special Secretary to Government

Government of Odisha
Works Department

Office Memorandum

File No.07556900012013- 14299/W, dated, 03/10/2017

Sub: Amendment to Para-3.5.5 (v) of OPWD Code, Vol.-I.

After careful consideration Government have been pleased to make amendment to Para-3.5.5 (v) of OPWD Code, Vol.-I with following modification.

"Additional Performance Security shall be obtained from the bidder when the bid amount is less than estimated cost put to tender. In such an event, only the successful bidder who has quoted less bid price/rates than the estimated cost put to tender shall have to furnish the exact amount of differential cost i.e. estimated cost put to tender minus the quoted amount as Additional Performance Security (APS) in shape of Demand Draft/Term Deposit Receipt pledged in favour of the Divisional Officer within seven days, otherwise the bid shall be cancelled and the security deposit shall be forfeited. Further, proceeding for blacklisting shall be initiated against bidder".

1. This amendment shall take effect from 24th July, 2017.
2. The Works Department Office Memorandum No.5288/W dt.04.05.2016 (Annexure-I-A) stands modified accordingly pursuant to the judgment dated, 24.07.2017 of the Hon'ble High Court of Orissa.
3. This has been concurred in by the Law Department and Finance Department vide their U.O.R. No 1668/L dt 19.08.2017 & U.O.R. No.56-WF-I dt.24.08.2017 respectively.

[Signature]
EIC - cum- Secretary to Government

Memo No. 14300 W, dated, 03/10/17

Copy forwarded to P. S. to Hon'ble Chief Minister, Odisha for information and necessary action.

[Signature]
FA - cum- Addl. Secretary to Government

Memo No. 14301 W, dated, 03/10/17

Copy forwarded to OSD to Chief Secretary, Odisha / P.S. to Development Commissioner-cum-Additional Chief Secretary, Odisha / P.S. to Principal Secretary, Finance Deptt. for information and necessary action.

[Signature]
FA - cum- Addl. Secretary to Government

(Cont.-2)

Memo No. 14302 W, dated, 03/10/17
Copy forwarded to the Principal Accountant General (A&E), Odisha, Bhubaneswar /
Principal Accountant General (E & S R Audit), Odisha, Puri Branch, Puri for information and
necessary action.

FA - cum- Addl. Secretary to Government
03/10/17

Memo No. 14303 W, dated, 03/10/17
Copy forwarded to All Departments / Managing Director, OB & CC Ltd.,
Bhubaneswar / Managing Director, OCC Ltd., Bhubaneswar for information and necessary
action.

FA - cum- Addl. Secretary to Government
03/10/17

Memo No. 14304 W, dated, 03/10/17
Copy forwarded to EIC (Civil), Odisha / All Chief Engineers, Odisha / All
Superintending Engineers / All Executive Engineers (All under Works Department) for
information and wide circulation among subordinate offices.

FA - cum- Addl. Secretary to Government
03/10/17

Memo No. 14305 W, dated, 03/10/17
Copy forwarded to the Director, Printing, Stationary & Publication, Odisha, Cuttack
for information and necessary action.

He is requested to publish this amendment in the next issue of Odisha Gazette.

FA - cum- Addl. Secretary to Government
03/10/17

Memo No. 14306 W, dated, 03/10/17
Copy forwarded to A/C-I Section / A/C-II Section / Road Section / Plan Section /
Building Section / Budget Section / N Hs. Section / EC & AA Section / PPP Cell / EAP Cell /
OSWAS Control Room, Works Department for information and necessary action.

FA - cum- Addl. Secretary to Government
03/10/17

Procedure for Electronic receipt, accounting and reporting of Cost of Tender Paper and Earnest Money Deposit on submission of bids

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

2. Electronic receipt of cost of tender paper has been successfully tested through SBI payment gateway. Now it has been decided to introduce electronic receipt of **Cost of Tender Paper and Earnest Money Deposit on submission of bids** through payment gateway of designated banks such as SBI/CICI Bank/HDFC Bank for all Government Departments, State PSUs, Statutory Corporations, Autonomous Bodies and Local Bodies etc, in phases (ANNEXURE-4). The process outline as well as accounting and reporting structure are indicated below:

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

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

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

d) Credit of receipts into the Government accounts and to the designated Bank account of the participating entities indicated in Para 2 above would be faster.

3. Only those bidders who successfully remit their **Cost of Tender Paper and Earnest Money Deposit on submission of bids** would be eligible to participate in the tender/bid process. The bidders with pending or failure payment status shall not be able to submit their bid. Tender inviting authority, State Procurement Cell, NIC, the designated Banks shall not be held responsible for such pendency or failure.

4. Banking arrangement:

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

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

5. Procedures of bid submission using electronic payment of tender paper cost and EMD by bidder:

a) **Log on to e-Procurement Portal:** The bidders have to log onto the Odisha e-Procurement portal (<https://tendersodisha.gov.in>) using his/her digital signature certificate and then search and then select the required active tender from the "Search Active Tender" option. Now, submit button can be clicked against the selected tender so that it comes to the "My Tenders" section.

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

c) **Electronic payment of tender paper cost and EMD:** Then the bidders have to select and submit the bank name as available in the payment options

i. A bidder shall make electronic payment using his/her internet banking enabled account with designated Banks or their aggregator banks.

ii. A bidder having account in other Banks can make payment using NEFT/RTGS facility of designated Banks.

• Online NEFT/RTGS payment using internet banking of the bank in which the bidder holds his account, by adding the account number as mentioned in the challan as an interbank beneficiary.

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

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

6. Settlement of Cost of Tender Paper:

a) **Cost of Tender Paper:** In respect of Government receipts on account of **Cost of Tender Paper**, the e-Procurement portal shall generate a MIS for the State Procurement Cell (SPC). The MIS will contain an abstract of the cost of tender paper collected with reference to **Bid Identification Number**. The State Procurement Cell shall generate Bank-wise-head-wise challans separately for **Cost of Tender Paper** and instruct the designated Banks to remit the money to the State Government account under different heads. In respect of the cost of tender paper received through the e-procurement portal, the remittance to the Cyber Treasury account will be made to the Head of Account 0075-Misc, General Services-800-Other Receipts -0097-Misc, Receipts-02237-Cost of Tender Paper.

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

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

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

e) Back-end Transaction Matrix of Electronic receipt of Cost of Tender Paper and Earnest Money Deposit on submission of bids is enclosed in the Annexure.

7. Settlement of Earnest Money Deposit on submission of bids:

a) The Bank will remit the **Earnest Money Deposit on submission/cancellation of bids** to respective bidders accounts as per direction received from TIA through e-procurement system

8. Forfeiture of EMD:

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

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

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

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

9. Role of the Banks:

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

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

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

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

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

10. Role of State Procurement Cell:

- a) Communicate requirements of Government departments/ State PSUs/ Autonomous Bodies/ ULBs online payment requirements to National Informatics Centre / the authorised Banks for mapping/ customization.
- b) In every working day, the State Procurement Cell shall generate MIS from the e-Procurement portal to ascertain the tender paper cost received in the e-Tendering process separately bank-wise for the Government Department and the PSUs/ULBs. The SPC shall generate bank-wise separate online challans from the Odisha Treasury portal and make the remittance through over the counter facility or NEFT/RTGS (as and when this functionality is available in Treasury portal) and issue instruction to the bank for remittance of the receipt to the State Government account.
- c) The State Procurement Cell shall be responsible for providing challan details and MIS in respect of the remittance towards tender paper cost to the Tender inviting authorities for their record.
- d) State Procurement Cell shall monitor the progress of e-Tendering by different Government departments / State PSUs/ Autonomous Bodies / ULBs through an MIS. State Procurement Cell shall monitor and send monthly progress reports to the Government.
- e) The e-Procurement system will generate a consolidated refund & settlement XML file as an end of the day activity.
- f) e-procurement system will provide a web service for payment gateway (PG) provider to pull the encrypted refund and settlement details in XML file against a day.
- g) Similarly, payment gateway (PG) provider will provide a web service to pull the refund and settlement status against a day.
- h) e-procurement system will update the status accordingly for reconciliation report.

11. Role of National Informatics Centre :

- a) Customize e-Procurement software and web-pages of Government of Odisha (<https://tendersodisha.gov.in>) to enable the provision for electronic payment.
- b) The NIC, Odisha will modify / rectify the errors in electronic data relating to the Chart of Account.
- c) NIC will provide an interface to organisations to download the electronic receipt data.
- d) Enable automatic generation of daily XML files from e-Procurement system and ensure delivery of the same to the authorised Banks for enabling automatic refund/settlement of funds.
- e) NIC shall enable the e-Procurement portal to generate MIS as required for the State Procurement Cell in order to make remittance of the tender paper cost to the State Government account using the Odisha Treasury portal.

12. Role of Cyber Treasury :

- a) The cost of the tender paper deposited by the SPC using the Odisha Treasury Portal which will be accounted for by the Cyber Treasury and it shall submit the accounts to A.G (O) as per the established process.
- b) The Cyber Treasury will provide MIS as required to the SPC for the purpose of accounting and reconciliation of the electronic remittances made to the State Government account.

13. Redressal of Public grievances :

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

14. Applicability and modification of existing rules / orders:

The modalities prescribed in this Office Memorandum for downloading of tender paper, submission and rejection of bid, acceptance of Bids as well as refund and forfeiture of earnest deposit will be applicable for electronic submission of bids through e-procurement portal. Existing provisions regulating cost of tender paper, earnest money deposit in OPWD Code and OGFR would stand modified to the extent prescribed.

15. These arrangements would be made effective after signing of MoU between the designated Banks and the State Procurement Cell, firming up of Banking arrangements and technical integration between designated Bank and e-Procurement Portal.

ANNEXURE-I

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

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

Government of Odisha
Works Department

OFFICE MEMORANDUM

File No.07556900222018- 14459 W, dated, 20-09-2018

Sub:- Amendment to Para-3.5.5(v) of the OPWD Code, Volume-I.

After careful consideration Government have been pleased to make amendment to Para-3.5.5(v) of the Odisha Public Works Department Code, Volume-I with the following modification.

"Additional Performance Security shall be obtained from the bidder when the bid amount is less than estimated cost put to tender. In such an event, only the successful bidder who has quoted less bid price/rates than the estimated cost put to tender shall have to furnish the exact amount of differential cost i.e. estimated cost put to tender minus the quoted amount as Additional Performance Security (APS) in shape of Term Deposit Receipt pledged in favour of Divisional Officer/Bank Guarantee in favour of the Divisional Officer from any Nationalized/Scheduled Bank in India counter guaranteed by its local branch at Bhubaneswar within seven days of issue of Letter of Acceptance (LoA) by 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."

1. This shall take effect from the date of issue of this Office Memorandum.
2. The codal provision exist in Works Department Office Memorandum No.14299/W dt.03.10.2017 stand partially modified to the above extent with effect from the date of issue of this Office Memorandum.
3. This has been concurred in by the Finance Department vide their U.O.R. No.1530-ACSF Dt.21.08.2018.

sd/185118
EIC - cum- Secretary to Government

Memo No. 14460 W, dated, 20-09-2018

Copy forwarded to P. S. to Hon'ble Minister, Works, Odisha for information and necessary action.

Sd/209113
FA - cum- Addl. Secretary to Government

(P.T.O.)

Government of Odisha
Works Department

OFFICE MEMORANDUM

File No.07556900222018- 14468/W, dated, 20-09-2018

Sub:- Amendment to Para-3.5.19(a)(b) of the OPWD Code, Volume-I.

After careful consideration Government have been pleased to make amendment to Para-3.5.19(a)(b) of the Odisha Public Works Department Code, Volume-I with the following modification.

“Security for the due fulfillment of a contract should invariably be taken. The security may be taken in shape of N.S.C./Post Office Savings Bank Account/Post Office Time Deposit Account/ Kissan 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 towards E.M.D/initial security deposit /any other security deposit from the contractor or supplier”.

1. This shall take effect from the date of issue of this Office Memorandum.
2. This has been concurred in by the Finance Department vide their U.O.R. No.1530-ACSF Dt.21.08.2018.

Obt 20/9/18
EIC - cum- Secretary to Government

Memo No. 14469 W, dated, 20-09-2018

Copy forwarded to P. S. to Hon'ble Minister, Works, Odisha for information and necessary action.

S. K. Singh 20.9.18
FA - cum- Addl. Secretary to Government

Memo No. 14470 W, dated, 20-09-2018

Copy forwarded to OSD to Chief Secretary, Odisha / Sr. P.S. to Development Commissioner-cum-Additional Chief Secretary, Odisha / Sr. P.S. to Principal Secretary, Finance Deptt. for information and necessary action.

S. K. Singh 20.9.18
FA - cum- Addl. Secretary to Government

Memo No. 14471 W, dated, 20-09-2018

Copy forwarded to the Principal Accountant General (A&E), Odisha, Bhubaneswar / Principal Accountant General (E & S R Audit), Odisha, Puri Branch, Puri for information and necessary action.

S. K. Singh 20.9.18
FA - cum- Addl. Secretary to Government

(P T O)

Government of Odisha
Works Department

Office Memorandum

File No.07556900042013 (Pt-IV) - 12366 W, Dated. 8.11.2013

Sub:-Amendment of Codal / Contractual provisions.

After careful consideration Government have been pleased to make amendment to contractual and codal provisions for increasing the efficiency and transparency of Department dealing with infrastructure development of the State as per Annexure- I, II, III, IV, V, VI & VII.

1. These amendments shall take effect from the date of issue of the order.
2. Accordingly, relevant existing codal/ contractual provision stands modified with effect from the date of issue of this O.M.
3. This has been concurred in by Finance Department in their UOR No.157-WF-I dt.17.5.2012.

Solanki
8/11/13

EIC - cum- Secretary to Government

Memo No. 12367 W, Dated. 8.11.2013

Copy forwarded to P. S. to Hon'ble Chief Minister, Odisha for information and necessary action.

Jaisankar
8/11/2013

FA - cum- Addl. Secretary to Government

Memo No. 12368 W, Dated. 8.11.2013

Copy forwarded to OSD to Chief Secretary, Odisha/ P.S. to Development Commissioner- cum-Additional Chief Secretary, Odisha for information and necessary action.

Jaisankar
8/11/2013

FA - cum- Addl. Secretary to Government

Memo No. 12369 W, Dated. 8.11.2013

Copy forwarded to All Departments / Managing Director, OB & CC Ltd., Bhubaneswar / Managing Director, OCC Ltd., Bhubaneswar for information and necessary action.

Jaisankar
8/11/2013

FA - cum- Addl. Secretary to Government

Annexure- I

1) Amendment to Para-3.4.16 (a) (vii) of OPWD Code, Vol-I by substitution

Note- (vii) - For the purpose of estimate, the approved quarry lead is to be provided judiciously. Engineers in charge would be responsible for ensuring the quality of the materials supplied. The contractors would, however, be responsible for procurement of materials from authorised sources and voluntarily disclose the source of procurement for the purpose of billing. Besides, the bidder would be required to submit the details of quarry for procurement while submitting the bids.

Annexure- II

2) 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 participation in bidding for three years and action will be taken to blacklist the contractor. In that case, the L2 bidder, if fulfils, other required criteria would be called for drawing agreement for execution of work subject to the condition that L2 bidder negotiates at par with the rate quoted by the L1 bidder otherwise the tender will be cancelled. In case a contractor is black listed, it will be widely publicised and intimated to all departments of Government and also to Govt. of India agencies working in the state.

Annexure- III

3) Amendment to Appendix- IX ,Clause-36 of OPWD Code, Vol-II by inclusion

Clause No- 36- If the rate quoted by the bidder is less than 15% of the tendered amount, then such a bid shall be rejected and the tender shall be finalized basing on merits of rest bids. But if more than one bid is quoted at 14.99% (Decimals up to two numbers will be taken for all practical purposes) less than the estimated cost, the tender accepting authority will finalize the tender through a transparent lottery system, where all bidders/their authorised representatives, the concerned Executive Engineer and DAO will remain present.



Annexure- IV

4) (A) Amendment to Para-3.5.5 (V) Note-II of OPWD Code, Vol-I by substitution

Note- (II) - When the bid amount is up to 10% less than the estimated cost, no additional performance security is required to be deposited. When the bid amount is less than the estimated cost by more than 10% and within 15%, in such an event, the successful bidder will deposit the additional performance security to the extent of 1.5 times of the differential cost of the bid amount and 10% of the estimated cost.

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

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 days of such completion by the concerned SE,CE & the Administrative Department. The incentive for timely completion should be on a graduated scale of one percent to 10 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 =10% of Contract Value
Before 20 to 30% of contract period =7.5% of Contract Value
Before 10 to 20% of contract period =5% of Contract Value
Before 5 to 10% of contract period =2.5% of Contract Value
Before 5% of contract period =1% of Contract Value

Annexure- V

5) Amendment to Para-3.2.8 Note-II of OPWD Code, Vol-I by inclusion

Note-II- In case of tender accepted below schedule of rate, the tender amount excluding centages shall be treated as sanctioned amount and allotment will be limited to that extent. Any deviation in scope of work affecting the agreement amount in such an agreement will be governed by the relevant provisions of OPWD Code.

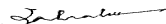
Signature

6) Amendment to Appendix- XXX (Bills) Clause 21 of OPWD Code, Vol-II & to the Clause-6 of F2 contract

Bills- Clause -21- For works above values Rs 5.00 lakh in civil works and work value above Rs 1.00 lakh in electrical/PH works the J.E.s & A.E.s will be required to submit bill for each on going work on 20th or next working day of every month to the concerned EE. The E.E. on receipt of the bill will take steps for payment of the same by 30th or the next working day during the month. The E.E. in charge of the Division will furnish a certificate to the chief engineer with copy to the concerned SE that the bills for all on going months have been paid failing action will be initiated against the erring officer."

7) 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 on the part of the agency to achieve the milestone liquidated damage will be imposed.



CHIEF ENGINEER, DRAINAGE
DIARY
No. 4487
GOVERNMENT OF ODISHA
DEPARTMENT OF WATER RESOURCES
9/9/14

IIM-35/2014, No. 20444 /WR.,

Dated. 31/11/14

From

Sri N. R. Swain,
FA-Cum-Joint Secretary to Govt.

To

The Chief Engineer,
Drainage, Cuttack.

Sub:- Clarification in connection with bid quoted 15% less over the amount put to tender.

Ref:- DOWR letter No.14238 dated 12-6-2014 and your letter No.4319 dated 28-7-2014.

Sir,

* With reference to the subject and letter cited above I am directed say that the matter was discussed in the codes revision committee meeting held on 3-5-2014 and 23-8-2014. The Chairman of the Committee clarified that bid quoted up to 14.99% less over the amount put to tender only shall be accepted.

In view of the above, you are directed to proceed as per the exact wording and meaning that comes out from the amended clause-36 of Appx-IX of OPWD code vol-II.

Yours faithfully,

[Signature]
03/09/14
FA-Cum-Joint Secretary

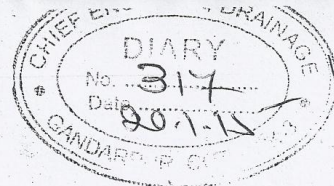
[Signature]
Memo No 4952 dt 10/09/14
DR-1-M-16/14

Copy forwarded to All S.E./E.Es under this organisation for information and necessary action.

[Signature]
10/09/14
A.C.E, Drainage

Circular file
GOVERNMENT OF ODISHA
Department of Water Resources

Government of Odisha
Works Department



Office Memorandum

File No.07556900052014 -

16 W, dated,

01/01/2015

Sub: - Acceptance of Single Tender.

After careful consideration Government have been pleased to make following modification to Notes- (iii) of Para-3.5.18 of O.P.W.D. Code, Volume-I & Rule-29 of Appendix-IX of O.P.W.D. Code, Volume-II for Acceptance of Single Tender in response to a Notice Inviting Tender.

Notes- (iii) of Para-3.5.18 – The single tender received in the first call shall be cancelled without opening of the bid. The acceptance of a single tender received, even after retendering should have prior approval of the next higher authority.

Rule-29 of Appendix-IX – when in response to a notice calling for tenders, only a single tender is received in the first time, the tender shall be cancelled without opening of the bid and fresh tender be invited publicly. If single tender is received, even after retendering then the approval of the next higher authority should be obtained, if the tender is otherwise in order and acceptable.

1. This shall take effect from the date of issue of this Office Memorandum.
2. This has been concurred in by the Finance Department vide their U.O.R. No.254-WF-I Dt.13.11.2014.

[Signature]
EIC - cum- Secretary to Government

Memo No. 17

W, dated,

01/01/2015

Copy forwarded to P. S. to Hon'ble Chief Minister, Odisha for information and necessary action.

[Signature]
FA - cum- Addl. Secretary to Government

Memo No. 434
DW-I-M-16/15 dt. 27/01/15 (P.T.O.)

Copy forwarded to all GE's & EE's under this Organisation Estimating Branch A.T.O for information and necessary action.

[Signature]
ACE Drainage. Ch.

PAYMENT OF EMD/BID SECURITY AND COST OF BID DOCUMENTS:

- (i) Guidelines for preparation of bids online mode has been issued by Government in Works Department letter No.1027 dated 24.01.09 & No. 7885 dated 23.07.2013 and appended at last part of this document. Government of Odisha has introduced e payment gateway in to the portal for payment of cost of Bid and Bid Security / Earnest Money Deposit. The process of using e-payment gateway is mentioned above in the“ Procedure for Electronic receipt, accounting and reporting of Cost of Tender paper and Earnest Money Deposit o submission of bids” as per Works Department Office Memorandum No.17254 dtd. 05.12.2017. The bidder are required to go through the procedure before preparation of bids.
- (ii) The EMD or Bid Security payable along with the bid is 1% of the amount put to tender or as mentioned in the bid document. The validity period of the EMD or Bid Security shall be as mentioned in the bid document. Any bid not accompanied by an acceptable Bid Security and not secured as indicated in the bid document shall be rejected as nonresponsive. The bid security shall be retained till such time the successful bidder furnishes Initial Security Deposit (ISD) or Performance Security acceptable to the Officer inviting the Bid. Failure of the successful Bidder to comply with the requirements shall constitute sufficient grounds for cancellation of the award and forfeiture of the Bid Security. The Bid security shall be valid for period of 90 days beyond the validity of the bid.
- (iii) Bid security @ 1% of the amount put to tender i.e. Rs. **61,500/-** only must accompany the tender. **The bid security shall be remitted online mode** only.
- (iv) The original documents along with a set of its xerox copies against the scanned copy of RC (valid Contractor Registration certificate), GSTIN registration certificate, PAN card, Affidavit of authenticity, Affidavit of exemption of EMD and requisite documents submitted through website should be produced in the office of the **Superintending Engineer, Drainage Division, Kendrapara** for verification on demand after opening of the bid.
- (v) The Officers authorized by the Procurement Officer/ Publisher (Officer inviting Tender shall transmit the sealed envelope carefully to the procurement officer – Publisher shall provide signed receipt with date and time for having received the number of sealed envelopes.
- (vi) 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 and original of the same must be produced as and when required by **S.E, Drainage Division, Kendrapara** for verification of tender. The successful bidder have to submit the original Affidavit to the Superintending Engineer, Drainage Division, Kendrapara before drawal of the agreement.

In case the contractor proposes to engage machineries and equipments as asked for in the tender document owned or hired but deployed outside the State, he /she is required to furnish additional 1% EMD as bid security. The entire bid security including the additional bid security shall stand forfeited in case the contractor fails to mobilize the machineries with stipulated time as per the tender document.

Earnest money given with one tender previously and submitted with other tender is not to be entertained.

1.3 TAX CERTIFICATES:

The tenderers are also required to furnish Xerox/attested copy of the valid PAN CARD, ITCC (if any), GSTIN along with tender documents failing which the tender may not be considered.

2. PREBID 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.

3. VALIDITY OF TENDER:

- 3.1** 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.
- 3.2** The tenderer must furnish copy of Registration Certificate, PAN & GSTIN Registration 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.
- 3.3** The percentage rates quoted shall remain valid for a period of 90 (ninety) days from the last date prescribed for receipt of tenders.
- 3.4** 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.
- 3.5** Alternate tenders & conditional tenders 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.
- 3.6** Separate letters found in the tender box intimating modification to the tenders already submitted will not be considered.

- 3.7** 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 include all taxes including rent. GST on works contract, royalty 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.

The tender must quote the percentage of excess or less in the contract document and tenders containing indefinite terms shall not be considered. All rates must be for finished items of work unless otherwise mentioned in then tender schedule.

- 3.8** The rates in the tender should be written both in words and figures and in case of any discrepancy noted, the 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 labourer 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 labours engaged in risky operation.
- iv) Suitable fencing, barriers, signals, including parapet and electrical signal where necessary t 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.

- 3.9** 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.

- 3.10** In order to qualify for consideration for award of the contract the tenderer should have the following minimum qualification criteria failing which their bids will not be considered.

To substantiate the tenderer is required to submit authentic records duly certified by the Superintending Engineer of the Deptt. in support of such experience.

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

The payment for RA bill can be made to the agency on his request to the department. Only after substantial works being executed duly recommended by J.E & A.E.

- 3.11** All the tenderers 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.

4. AWARD OF CONTRACT

- 4.1** 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 to deposit, initial security 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 **Superintending Engineer, Drainage Division Kendrapara**. This initial security deposit together with the EMD and the amount of 5% deduction from each running bill as per P1 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 Superintending Engineer, the department will accept the initial security deposit in the accepted from prescribed in clauses as above pledged in favour of the **Superintending Engineer, Drainage Division Kendrapara** and in no other form. The Security deposit deducted from each running bill will be 3%. 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 Superintending Engineer)
- 4.2.** 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.
- 4.3.** In case of delay in acquisition of land no compensation will be admissible but extension of time will be granted.
- 4.4.** The earnest money deposited by the unsuccessful tenderers will be refunded as per relevant rules in force.
- 4.5.** Super/Special Class contractors shall employ under him one Graduate Engineer and two Diploma holders belonging to the State of Orissa. Likewise an 'A' Class contractor shall employ under him one Graduate Engineer or two Diploma holders belonging to state of Orissa. 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 Orissa. The Chief Engineer Roads,

Orissa 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.

4.6. 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.

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

5. OBSERVATIONS 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.

5.1 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.

5.2 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 labours engaged in the work as required under Labour Laws and Regulations. The Contractor shall not employ labour of minor age group.

5.3 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.

5.4 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 excavation 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.

5.5 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.

6. 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 then notice board of the Engineer-in-charge shall be treated to be intimation to the Contractor and the same shall be binding on him.

7. 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.

8. 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.

9. TAXES:

- a. The rates quoted by the Contractor shall be deemed to include all taxes including royalties of all materials GST that the contractor will have to purchase for performances of this contract.

b. Goods and Service tax :

During the course of contract period deduction of GST will be done as applicable as per Govt. norms.

c. INCOME TAX:

Income tax shall be deducted as per income tax rule (Provisional or as advised by Income Tax Department)

10. INTEREST:

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

11. PLANS AND DRAWINGS:

The work has to be carried out in accordance with the Orissa 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.

12. CONSTRUCTION PROGRAMME:

A. construction programme proposed and submitted by the contractor prior to issue of work order may be approved by the Engineer-in-charge. The contractor shall arrange for additional shifts whenever necessary to suit the revised construction programme. No extra payment on this account is admissible.

B. 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.

13. 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.

14. 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.

15. 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.

16. FORCE MAJOR:

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.

17. 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.

18. 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 other wise restricted by the Engineer-in-charge.

19. DEPARTMENTAL STOCK MATERIALS:

The contractor may be issued stock materials as per terms and conditions specified under Clause - 8 of F-2 contract for bonafied 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 there of is annexed separately Annexure-IV.

20. 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.

- 20.1.** 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.
- 20.2.** 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.
- 20.3.** 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.
- 20.4.** 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.

21. 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, levelling 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.

- 21.1.** The contractor should kept 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.

22. 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.

23. SITE ORDER BOOK:

A site order book with pages serially numbered will be issued by the Superintending 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 Superintending 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 Executive 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 Superintending Engineer and Chief Engineer shall be deemed to have been duly issued by the Engineer - in - charge for the contract.

24. CLAIM BOOK:

A claim book of pages serially numbered shall be issued by the Superintending 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.

25. RULE TO VERBAL ORDER:

It shall be the contractors 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.

26. STATUTORY OBLIGATIONS OF CONTRACTOR:

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

- 26.1.** The contractor shall have to construct and maintain coffer dam as required for the work during execution at his own cost.
- 26.2.** 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.
- 26.3.** 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.

- 26.4.** Department shall not pay compensation to the contractor for the damage occurred to the materials and work entrusted to his due to natural calamities.

27. 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.

28. 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.

29. 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.

30. 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.

31. REMOVAL OF CONTRACTOR'S MEN:

The contractor shall on the written direction of the Superintending 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.

32. 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.

33. 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 labourer engaged by him in the work.

34. 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.

35. PRICE PREFERENCE:

a) Schedule Caste and Schedule Tribe tenderers may 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 Orissa Works Deptt. Circular No.27748 dated 11.10.97.

b) Preference in price will also be given to M/s Orissa Construction Corporation Ltd. as per relevant Govt. Circular.

36. 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.

37. 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.

38. 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.

39. 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 Orissa 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.

- 39.1.** If any further necessary information is required, the **Superintending Engineer, Drainage Division Kendrapara** will furnish such information on written request, but it must be clearly understood that tenderer must be received in order and according to instruction / specifications appended herewith.

40. CLAUSE FOR ADDITIONAL SECURITY FOR UNBALANCED ITEMS:

Additional Performance Security shall be obtained from the bidder when the bid amount is less than estimated cost put to the tender. In such an event only the successful bidder who has quoted less bid price/ rates than the estimated cost put to tender shall have to furnish the Additional Performance Security as per the following rate. Additional performance security shall be taken on an incremental basis from the selected bidder for low bid prices in the project works as under vide Office Memorandum No.07764600022025-173/W Bhubaneswar Dt.03.01.2026.

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 is required.

II. where the bid price is below 10% but not below 20% of the project cost out 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 the additional performance guarantee percentage shall be applied on the bid price.

III. where the bid price is 20% of inore 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 below 20% of the project cost put 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% or next higher percentage based on weather 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. Justification for abnormally low bids shall be scrutinized by the Department Technical Committee and recommended to the competent authority of the Administrative Department for the approval of the Additional Performance Security (APS) An abnormally low bid is one in which the Bid price. In combination with other elements of the Bid, appears so low that it raises material concerns as to the capability of the Bidder to perform the contract at the offered price. Procuring Entity may, in such cases, seek written clarifications from the bidder, including detailed price analyses of its Bid price in relation to scope, schedule, resource mobilization, allocation of risks and responsibilities, and any other requirements of the bid document. If, after evaluating the price analyses the procuring entity determines that the Bidder has substantially failed to demonstrate its capability to deliver the contract at the offered price, the procuring Entity may reject the Bid/Proposal. However, it would not be advisable to fix a normative percentage below the estimated cost, which would automatically be considered as an abnormally low bid.

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 Superintending Engineer of the concerned Division and Divisional Accounts Officer (DAO) will remain present, vide O.M. No.07764600022025-632/W Dt.09.01.2026. The date of lottery will be contacted later on if necessary.

It the rate quoted by the SC and ST Category Contractors comes to the rate quoted by the L-1 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 contractors vide O.M. No.07764600022025- 632/W Dt.09.01.2026.

41. As regards the bidding process in which the tender has been floated before the issue of Works Department Office Memorandum No.173 dt.03.01.2026, the bid shall be finalized as per the earlier provisions in Appendix-IX, Clause 36 of OPWD Code Volume-II

42. The cost of empty cement gunny bags will be recovered from the contractor as per prevailing schedule of rate.
43. Percentage Rate Contract (vide Works Department letter No. 8310, dt. 17.05.2006) in case of Percentage rate Tender :
- i) The Contractor has to mention percentage excess or less over the estimated cost (in figures as well as words) in prescribed format of the Bill of Quantity (BOQ) appended to the tender document.
 - ii) DELETED
 - iii) Only percentage quoted shall be considered. Percentage quoted by the Contractor should be accurately filled –in figures and words so that there is no discrepancy.
 - a) If any discrepancy is found in the percentage quoted in words and figures, then the percentage quoted by the Contractor in words shall be taken as correct.
 - b) The contractor will write percentage excess / less up to two decimal point only. If he writes the percentage excess / less more than two decimal points, the first two decimal point shall only be considered without rounding off.
 - c) Tender shall be written legibly and free from erasures, over writings or corrections of figures, corrections, over writings & interpolations, where unavoidable, should be made by making out, initialing, dating and rewriting.
 - iv) In the contract P1 time is the essence. The contractor is required to maintain a certain rate of progress specify in the contract.
 - v) The quantity mentioned can be increased or reduced to the extent of 10% for individual items subject to a maximum of 5% over the estimated cost. If it exceeds the limit stated above prior approval of competent authority is mandatory before execution and making any payment.
 - vi) The period of completion is fixed and can not be altered except in case of exceptional circumstances with due approval of next higher authority.
 - vii) Bills for percentage rate tenders shall be prepared at the estimated rates for individual items only and the percentage excess or less shall be added or subtracted from the gross amount of the bill.

A contractor may be black listed as per Amendment made to Appendix XXXIV to OPWD Code Vol.-II on Rules for Black listing of contractor vide letter No. 3365, dt. 01.03.2007 of Works Department, Odisha.

As per said amendment of Contractor may be blacklisted :

- a) Misbehavior / threatening of Departmental & Supervisory officers during execution of work / tendering process.
- b) Involvement in any sort of tender fixing.
- c) Constant non-achievement of milestones on insufficient and imaginary grounds and non adherence to quality specifications despite being pointed out.
- d) Persistent and intentional violation of important conditions of contract.
- e) Security consideration of the State i.e. any action that jeopardizes the security of the State.
- f) Submission of false / fabricated / forged documents for consideration of tender

GENERAL INSTRUCTIONS TO CONTRACTORS

(Vide DoWR Letter No. 20415, Bhubaneswar/dtd.14.09.2015)

1. Any Agency or Contractor executing a work should be aware about the local festivals like Makar Sankranti, Raja Sankranti, Chaiti Parba, Danda Nata or any such festivals which may affect the work schedule. Therefore, the Contractor should engage more work forces during working period available at his disposal to complete the work as per schedule.
2. In the peak summer season, working hour is curtailed by the Labour Department to avoid exposure to personnel to the scorching sun and heat. It is the duty of the agency to increase the number of workforce and to employ the existing workforce during morning and afternoon hours as per Government orders.
3. Rainfall is a normal occurrence during monsoon in Odisha. So, unless there is unusually heavy rainfall resulting in a declared calamity, the Contractor is not eligible for any extension of time. The Contractor should plan the deployment of workforce and machinery, so as to complete the work as per schedule considering ordinary vagaries of the nature.

The same applies for borrow areas ponding also. The Contractor should foresee possible ponding of borrow area in monsoon and likewise life more quantity of soil/other materials during dry period, so as to complete the work as per schedule.
4. The Contractor should take up the work with due diligence in the acquired land without waiting for acquisition of the entire land. This should be completed in proportionally less period depending on the quantum of available work front.
5. The Agency should plan his work programme and mobilize men and machineries considering the canal closure programme of a particular system or area. Khariff / Rabi closure can't be imposed arbitrarily on the farmers as per the convenience of the agency. Closure of canal for the interest of work will be solely at the discretion of the Engineer-in-Charge and can't be claimed as a matter of right.
6. There will always be standing crop before harvesting season as per crop schedule and this fact has to be clearly understood by the agency. Extension of time on this ground may not be considered by Divisional Officers.
7. Only the day(s) of elections to the Local Bodies / Assembly / Parliament will be treated as a non-working day(s).

CHAPTER – II (FORM P-1)

CONTRACT FOR WORKS

ORISSA PUBLIC WORKS DEPARTMENT
(FORM P-1)
Percentage 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 / Superintending Engineer.

This notice will state the work to be carried out, the items and approximate amount 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 / Superintending Engineer shall also be open for inspection by the contractor at the office of the Sub-divisional Officer/ Superintending 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 / Superintending 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 percentage he is willing to undertake 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 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 Officer 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 Engineer 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.

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 deposit in favour of the Superintending Engineer. 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 **5** percent of the tendered value of the work and towards this amount, the earnest money already deposited by him shall be credited. .

Any balance of the Security money outstanding after completion of the contract with the tenderer may be made up by deductions of 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 Superintending Engineer of the Division, 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 (i.e. after one year of completion of works) and after the work is found defect free in all respects.

13. 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.

TENDER FOR WORKS

I/We hereby tender for the execution for the Governor of Orissa of the work specified in the under written memorandum at the rates specified therein within a period of **06 (Six) Calendar months** from the date of written order to commence and complete in all respect with the specifications, designs, drawings and other documents referred to in rule-1 there of and subject to the annexed conditions of contract and with such material as are provided for by and in all other respects in accordance with such conditions so far as applicable.

MEMORANDUM

- a) If several sub works are included they should be detailed in a separate list.
- a) Name of work : **Decongestion and Desilting of drains under Aali Constituency**
- b) Name of the Contractor :
- c).i Amount put to tender : **Rs. 6148679.00**
- ii. Agreement Amount :
- d) Earnest money deposit : **Rs. 61,500/- to be remitted online**
- e) The deposit will be 2% of the estimated cost of the work
- e) Initial Security deposit (including earnest money) to be deposited before the commencement of the work : **this deposit will be 2% of the accepted amount of tender**
- i) Additional Performance Security :
- f) This percentage deduction from bills will be credited to the contractor's security deposit
- f) Percentage to be deducted from bills:
- g) Time required for the work from date of written order to commence : **06 (Six) Calendar Months**
- h)i Date of written order to commence :
- ii. Stipulated date of completion :
- i) Total number of items of work tendered For : **02 (Two) item only**

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 there of to forfeit and pay to the Governor of Orissa or his successors in office the sums of money mentioned in the said conditions.

Dated theday of2026/ 2027

Signature of the Contractor

Signature of the
Contractor before
submission of tender

Witness:

Signature of one
witness to Tenderer's
signature

Address:

Occupation:

The above tender is hereby accepted by me on behalf
of the Governor of Orissa.

Dated theday of2026 / 2027

Signature of the
Officer by whom
accepted

CONDITIONS OF CONTRACT.

Clause I. All compensation or other sums of money payable by the contractor to Govt. under the terms of his contract may be deducted from or paid by 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 Govt. 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 cash or Government securities 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.

shall be final and conclusive against the contractor) and crediting him with the value

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 of 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 of the essence of the contract on the part of the contractor) and the contractor shall pay as compensation an amount $\frac{1}{2}$ percent on 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 unfinished after the proper dates 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 one-half of such time has elapsed, and three-fourth of the work, before three-fourth of such time has elapsed, in the events of the contractor failing to comply with the conditions he shall be liable to pay as compensation, an amount equal to one third percent of 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 provisions of this clause shall not exceed 10 percent on the estimated cost of the work as shown in the tender.

Compensation for delay.

The work should not be considered finished until such date as the Superintending Engineer shall certify as the date on which the work is finished after necessary rectification of defects as pointed out by the Superintending Engineer or his authorized agents are fully complied with by the contractor to the Superintending Engineer's satisfaction

Clause 2 (B) 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 Govt. (whether paid in one sum or deducted by installments) the Superintending Engineer on behalf of the Governor of Orissa shall have power to adopt any of the following courses, as he may deemed best suited to the interest of Govt.

Action when whole security deposit is forfeited.

i) To rescind the contract (of which rescission notice in writing to the contractor under the hand of the Superintending Engineer shall be Conclusive evidence) and 20% of the value of left over work will be realized from the contractor as penalty.

ii) To employ labour paid by the Public works department 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 cost & price certificate of the Superintending Engineer

of the work done, in all respects in the same manner and at the same rates as if it had been carried out by the contractor under the terms of his contract the certificate of the

Superintending 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 Superintending 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 Govt. 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 Superintending Engineer, the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchase or procured any materials or entered into any engagements or made any advance an account of or with a view to the execution of the work or the performance of the contract and in case the contract shall be rescind under the provision aforesaid the contractor shall not be entitled to recover or be paid any sum for any work there to force actually preformed under this contractor unless and until the Superintending 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.

Clause 3. In any case in which any of the powers, conferred upon the Superintending Engineer by clause 2 hereof shall have become exercisable and the same shall not be exercised the non exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable in the event of any future case 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 Superintending Engineer putting in force the powers vested in him under the preceding clause he may if he so desire, 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 as the contract rates, or in case of these not being applicable at current market rates to be certified by the Superintending Engineer whose certificate thereof shall be final otherwise the Superintending Engineer may be notice in writing to the contractor or his clerk of the works, foreman or other authorized agents require him to remove such tools plants, materials or stores from the premises (within a

Contractor remains liable to pay compensation if action not taken under Clause - 6

Power to take possession of or require removal of or sell contractor plants.

time to be specified in such

notice) and in the event of the contractor failing to comply with the such requisition the Superintending Engineer may remove them at the Contractor's expenses or sell them by auction or private sale on account of the contractor and at his risk in all respect, and the certificate of the Superintending Engineer as to the expenses of any such removal and the amount of proceeds and expenses of any such sale shall be final and conclusive against the contractor.

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 Superintending Engineer within 30 days of the date of the hindrance on account of which he desires such extensions as aforesaid and the Superintending 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 Superintending Engineer shall at the same time inform the contractor whether he claims compensation for delay.

Extension of time

Clause 5. On completion of the work the contractor shall be furnished with a certificate by the Superintending Engineer (herein after called the Engineer-in-charge) of such completion but no such certificate be given nor shall the work be considered to be complete until the contractor shall have removed from the area of the premises (to be distinctly marked by the Superintending 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 works doors windows, walls, floors or other parts or 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 Public Works department 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 work the Engineer-in-charge may at the expenses of the contractor remove such scaffoldings, materials and rubbish and dispose of the same as he thinks fit and clean of 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 of surplus materials as aforesaid except for any sum actually realized by the sale thereof.

Final Certificate.

Sub-Clause 5. If in the opinion of the Engineer-In-Charge, which shall be final & binding on the contractor, occupation or utilization of a portion of the work completed no way interferes with progress of the work the same may be occupied or utilized by on behalf of the Government under the written order of the Engineer-In-Charge and get the defects, if any rectified by the contractor at his 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.

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 admissible adjusted if possible before the expiry of 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 countersignature to the measurement list will be sufficient warrant and the Engineer-in-charge or his subordinate shall be binding on the contractor in all respects.

Payment on intermediate to be regarded as advances and bill to be submitted monthly.

Provided that, if any balance of 5% security is outstanding from each such payment shall be deducted so much, 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 the imperfect or unskillful work to be removed and taken away and reconstructed or re-erected or to be considered as an admission of due performance of the contract 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 Public Works Department 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.

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 price to be charged therefore as hereinafter mentioned being so far practicable for the convenience of the contractor but not so as in any way to control the meaning or effect of this contract are specified on 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 purpose 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 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 Govt. and shall not on any account be removed from the site of the work and shall all time 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

Stores supplied by the Government

the Engineer-in-charge's store at the prevailing market rate or at the issue 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 not 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 material or stock so supplied to him from the site of the work in contravention of the provisions of this clauses 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 process of sale thereof".

Clause 8 (b) Owing to difficulty in obtaining certain materials in the open market the Govt. have undertaken to supply materials specified in the schedule here to 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

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 conform exactly full and faithfully to 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 require be entitled at his own expense to make or cause to be made copies of the specifications and of all such design, drawings and instruction as aforesaid.

Work to be executed in accordance with specification, drawing and order

Clause 10. The Engineer-in-charge shall have power to make any alternation in or additions to the original specification, 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 alternation 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 respect on which he agreed to do the main work and at the same rates as are specified in the tender for

Do not invalidate contracts

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 rates 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 rate of the district then the contractor shall within seven days of date of his receipt of the order to carry out the work inform the Engineer-in-charge of the rate which it is his intention to charge for such class of work and if the Engineer-in-charge does not agree to this 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 contractor 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 the 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 according to such rates as shall be fixed by the Engineer-in-charge. In the event of a dispute the decision of the Superintending Engineer of the Circle will be final.

Clause 11. If at any time after the commencement of the work the Govt. or Orissa shall for any reason whatsoever nor require 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 but 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 alteration having made in the original specifications, drawings, designs and instruction which shall involve any curtailment of the work as originally contemplated.

No compensation or alteration in or restriction of work to be carried out.

Clause 12. If it shall appear to the Engineer-in-charge or his subordinate-in-charge of the work, that any work has been executed with unsound, imperfect unskillful workmanship or with materials of any inferior description, or that any materials or articles provided by him for the

Action and compensation payable in case of bad work

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 forth with 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 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 continue and in the case of any such failure the Engineer-in-charge may rectify or remove and 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 respect of the contractor.

Clause 13. All work under or in course of execution or executed in pursuance of the contract shall at all time be open 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 intension of the Engineer-in-charge or his subordinate to visit the works shall have been given to the contractor either himself be present to received orders and instructions, 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.

Work to be open for inspection.

Contractor or responsible Agents to be present.

Clause 14. The contractor shall give not less five days notice in writing to the Engineer-in-charge or his subordinate in charge of the work before covering up or otherwise placing beyond the reach of measurement 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 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 or the materials with which the same was executed.

Notice to be given before work is covered up.

Clause 15. If the contractor or his work people or servants shall break defect injure or destroy any part of building in which they may be working or any building road, fence, enclosure or grass land or cultivated ground contiguous to the premises on which the work or any part of it is being executed or if any damage shall happen to the work while in progress from any clause whatever or any imperfection became apparent in it within six months from the date of final certificate of its completion shall have been given by the Engineer-in-charge as 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 expense (of which the certificate of the Engineer-in-charge shall be final) from any sums that may

Contractor liable for damage done and for 6 months from date of completion.

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.

Clause 16. The contractor shall supply at his own cost all materials (except such special materials if any as may be accordance with the contract be supplied from the Engineer-in-charge's stores) plant, tools, appliances, implements ladders, cordage, tackle scaffolding and temporary works requisite or proper fro the proper execution of the work whether original altered or substituted and whether included in the specification or other documents forming part of the contractor or referred to in the conditions or not or which by the Engineer-in-charge at the expense of the contractor also provide all necessary fencing and light required to protect the public from accident and shall be bound to under the contract, or from his security deposit or the proceeds of sale thereof or of a sufficient portion thereof. The contractor shall bear the expenses of defense every suit action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and cost which may be awarded in any such suit action proceedings to any such person or which may with the consent of the contractor be paid to compromise any claim by any such person.

Contractor to supply plants, ladders, scaffolding etc.

And is liable for damages arising from non-provision of lights fencing etc.

Clause 17. No female labour 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 eighteen 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 Superintending 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 whether any labour employed by the contractor is below the age of eighteen years and to refuse to allow any labour whom he decides to be below the age of eighteen years to be employed by the contractor.

Clause 18. The contractor shall not be assigned or sublet without the written approval of the Superintending Engineer. And if the contractors shall assign or sublet his contract or attempt so to do or become insolvent or commence any insolvency proceedings, or make any composition with his creditor or attempt so to do or if any bribe gratuity, gift, loan perquisite reward or advantage, 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 person in the employ of Govt. in any way relating to his office employment or if any such officer on person shall become in any way directly or indirectly interested in the contract, the Superintending Engineer, may thereupon by notice in writing to rescind the contract and the security deposit of the contractor shall thereupon stand forfeited and be absolutely at the disposal of Govt. and the same consequences shall ensure as if the contract has been rescinded under clause-3 hereof and in addition the contractor shall not be entitled to recover

Work not to be sublet.

Contract may be rescinded any security deposit forfeited for subletting bribing or if contractor become insolvent

or be paid for any work there to for actually performed under the contract.

Clause 19. All sums payable by way of compensation under any of the conditions shall be considered as reasonable compensation to be applied to the use of Govt. without reference to the actual loss or damages sustained, and whether or not any damage shall have been sustained.

Sum payable by way of compensation to be considered as reasonable compensation without reference to actual loss.

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.

Change in constitution of firm

In case of failure to notify the change in the constitution within fifteen day 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 Govt. and the same consequences shall ensure as if the contract had been rescinded under clause 3 thereof 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 Superintending 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 shall be final and conclusive against the contractor with regard to any sum or sums payable to him under the provisions of this clause.

Lump sums in the estimate.

Clause 24. In the case of any class of work for which there is no such specification as is mentioned in rule. I, such work shall be carried out in accordance with the circle specification and in the event of the there being no circle specification then in such case the work shall be carried out in all respects in accordance with the instruction and requirements of the Engineer-in-charge.

Action where no specification.

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 Govt. may be liable to pay under Workmen's Compensation Act VIII of 1923 to any workmen employed in course of execution of any part of the work covered by these contract.

Clause 27. That the purpose of jurisdiction in the event of dispute if any the contract should be deemed to have been entered into within the State of Orissa and it is agreed that neither party to the contract or agreement will be competent to bring a suit in regard to the matters covered by this contract at any place outside the State of Orissa.

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. The contractor at his own cost for his labour camp will make sanitary arrangements.

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 (DELETED)

31 (a) (i) – If during the progress of the work, the Price of any material (excluding the cost of steel, cement and Bitumen) is incorporated in the work (not being materials supplied from the Engineer-in-charge's store in accordance with clause & hereof) increases or decreases as result of increase or decrease in the average wholesale price index (all commodities) and the contractor there upon necessarily and properly pays in respect of that material (incorporated in the work) such increased or decreased price then he shall be entitled to reimburse or liable to refund, quarterly as the case may be such an amount as shall be equivalent to the loss or minus difference of 75% in between the average wholesale price index (all commodities) which is operations/for the quarter under consideration and that operated for the quarter in which the tender was opened as per the formula indicated below provided that the work has been carried out within the stipulated time or extension there of as are not attributable to him.

ii) Increase/decrease of cost of Steel, Cement and Bitumen are to be reimbursed / liable to be refunded with prior approval of Govt. as follows-

Steel- Rate as fixed by Steel Authority of India Ltd. (SAIL)

Cement – Average factory price of three manufacturers of cement inside the State.

Bitumen – Rate as fixed by Indian Oil Corporation (I.O.C).

Formula to calculate the increase or decrease in the price of materials.(steel, cement, bitumen & other materials)

$$V_m = 0.75 \times \frac{P_m \times R}{100} \times \frac{(I - I_o)}{I_o}$$

V_m = Increase or decrease in the cost of work during the quarter under consideration due to change in the price of materials.

R = The value of work done in rupees during the quarter under consideration.

I_o = The average wholesale price Index (all commodities) for the quarter in which the tender was opened as published in R.B.I bulletin for other materials and for steel, cement and bitumen, the average price index will be for the quarter in which the tender was opened as defined above i.e rate fixed by Steel Authority of India Ltd, Average factory price of three manufacturers of cement inside the State and rate fixed by Indian Oil Corporation (I.O.C) respectively.

I = The average wholesale price Index (all commodities) for the quarter under consideration as published in R.B.I bulletin for other materials and for steel, cement and bitumen, the average price index will be for the quarter under consideration as defined above i.e, rate fixed by Steel Authority of India Ltd, Average factory price of three manufacturers of cement inside the State and rate fixed by Indian Oil Corporation (I.O.C) respectively.

P_m= Percentage of material component as per sub clause of this clause

(b) Similarly if during the progress of work the minimum wage of labour increases or decreases as a result of increases or decreases in the average consumer's Price Index for industrial worker (Wholesale Price), & the contractor there upon necessarily & properly pays in respect of labour engaged on execution of the work such increased or decreased wages, then he shall be entitled to reimbursement or liable to refund, quarterly as the case may be, such an amount as shall be equivalent to the plus or minus difference in between the average Consumer's Price Index for industrial workers (Wholesale price) which is operating for the quarter under consideration & that operated for the quarter in which the tender was opened, as per the formula indicated below.

Formula calculate the increase or decrease in the cost of labour –

$$V_I = \frac{0.75 \times P_I \times R}{100} \times \frac{(L - L_o)}{L_o}$$

V_I= Increase or decrease in the cost of work during the quarter under consideration due to change in the rate of minimum wages of labour.

R = The value of work done in rupees during the quarter under consideration.

L_o= The average minimum wages for the quarter in which tender was opened (as published by Labour Commissioner, Government of Orissa.

L= The average minimum wages for the quarter under the consideration as published by Labour Commissioner, Government of Orissa.

P_L= Percentage of labour component as per sub-clause of this clause.

(c) Similarly if during the progress of work the price of petrol, Oil and Lubricants (Diesel oil being the representative item for price adjustments) increases or decreases as a result of the price fixed therefore by the Government of India and the contractor there upon necessarily and properly pays such increased or decreased price towards, petrol, oil and lubricants used on execution of the work then he shall be entitled to reimbursement or liable to refund, quarterly as the case may be such an amount as shall be equivalent to the plus or minus difference in between the price of POL which is operating for the quarter under consideration and that operated for the quarter in which the tender was opened as per the formula to calculated below.

Formula to calculate to the increase or decrease in the price of P.O.L.

$$K_I = \frac{0.75 \times K_2 \times R \times (D_2 - D_1)}{100 \times D_1}$$

K_I= Increase or decrease in the cost of work during the quarter under consideration due to change in the price of P.O.L.

R= The value of the work done in rupees during the quarter under consideration.

D₁= Average price per liter of diesel oil which was fixed by the Indian Oil Corporation (I.O.C) for consumer pump nearest to the work site during the quarter in which the tender was opened.

D₂= Average Price per liter of diesel Oil which is fixed by the Indian Oil Corporation (I.O.C) for consumer pump nearest to the work site during the quarter under consideration.

K₂= Percentage of P.O.L component as per sub-clause of this clause

(d) The following shall be the percentage of materials labour and POL component for reimbursement/refund on variation in price of materials, labour and POL as in sub-clause.

Category of works	Percentage of materials				Total	% of labour	% of POL
	Cement	Steel	Bitumen	Other materials			
<u>Irrigation works</u>							
a) Structure	13	7		45	65	30	5
b) Earth work Canal work Embankment work etc.				35	35	60	5

(e) Reimbursement/refund on variation in price of materials, labour and POL as per sub-clause (a) (b) and (c) of this clause shall be applicable only in respect of contract of one year or more provided that the work has been carried out within the stipulated time or extension thereof as are not attributable to contractor.

(f) The contractor shall for the purpose of sub-clause (a) (b) and (c) of this clause keep such books of account and other documents as necessary to show the amount of increase claimed or reduction available and shall allow inspection of the same by a duly authorised representative of Government and further shall at the request of the Engineer-in-charge furnish verified in such manner as the Engineer-in-charge may require any document kept and such other information as the Engineer-in-charge may require.

(g) The contractor shall within a reasonable time of his becoming aware of any alteration in the price of such materials/wages of labour and or price of POL give notice thereof to the Engineer-in-charge stating that the same is given in pursuant to this condition together with an information relating there to which he may be in a position to supply.

Clause 32. After the work is finished all surplus materials and debris are to be removed by the contractor and preliminary works such as vats, mixing platforms, etc are to be dismantled and all materials removed from site.

FAIR WAGE CLAUSE

Clause 33. (a). 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 labour for work done by such laborers fair wages.

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 should constitute fair wages.

The Superintending Engineer shall have the right to enquire into and decide any complaint alleging that the wages paid by the contractor to any laborer for the work done by such laborer is less than the wages as per sub-paragraph 1 above.

(b) The contractor shall, notwithstanding the provision of any contract to contrary, cause to be paid a fair wage to laborers indirectly engaged on the work including any labor engaged by his sub-contractors in connection with the said work, as if the laborers had been immediately employed by him.

(c) 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 Government in regard to payment of wages, wage period deduction from wages recovery of wages not paid and deduction unauthorized 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 matters of a like nature.

(d) The Superintending 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 fulfillment of the conditions of the contract for the benefit of the workers non payment of wages or of adductions made from his or 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.

(e) Vis-a-Vis, the Govt. of Orissa 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-contractor.

(f) The regulations aforesaid shall deemed to be a part of this contract and any branch thereof shall be branch of this contract.

Orissa P.W.D. / Electricity Department Contractor's Labour Regulations

1. **Short title** - These regulations may be called "The Orissa Public Works Department / Electricity Department Contractor's Regulation."

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-

1) **"Labour,"** mean workers employed by a contractor of the Orissa Public Works Department/Electricity Department directly or indirectly through a sub-contractor or other persons or by an agent on his behalf.

2) **"Fair Wages"** 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 should constitute fair wages.

3) **"Contractor"** shall include every person whether a sub-contractor or headman or agent employing labour on the work taken on contract.

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

3. Display of notice regarding wages etc.

The contractor shall –

a) 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 in English and in the local Indian language spoken by the majority of the workers, giving the rate of wages prescribed by the State Public Works Department / Electricity Department for the district which the work is done.

b) Send a copy of such notice to the Engineer-in-charge of the work.

4. Payment of Wages:

1. Wages due to every worker shall be paid to him direct.
2. All wages shall be paid in current coin or currency or in both.

5. Fixation of wage period:

1. The contractor shall fix the wage period in respect of which the wages be payable.
- 2) No wage period shall exceed one month.
- 3) Wages of every workman employed on the contract shall be paid before the expiry of ten days, after the last day of the wage period in respect of which the wages are payable.
- 4) 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 of which his employment is terminated.
- 5) All payments of wages shall be made on a working day.

6. Wage book and wages cards, etc:

- 1) The contractor shall maintain a wage book of each worker in such form as may 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.

- 2) The contractor shall also maintain a wage card for each worker employed on the work.
- 3) The Superintending Engineer may grant an extension from the maintenance of wage bond, wage 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 -

- 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 by 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) Deductions for damage to or loss of goods 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 Orissa Government may allow from time to time
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 any opportunity of showing cause against such fines or deduction.
3. The total amount of fines which may be imposed in any one wage period on a works shall not exceed an amount equal to five paise in a rupee of the wages payable to him in respect of that wage period.
4. No fine imposed on any worker shall be recovered from his by installments or after the expiry or 60 days from the date on which it was imposed.

8. Register of fines etc:

1. The contractor shall maintain a register of fines and of all deductions for damage or loss such register shall mention the reason for which fine was imposed or deductions for damage or loss was made.
2. The contractor shall maintain a list in English and in the local Indian language, clearly defining acts and commissions for which penalty of fine can be imposed it shall display such list and maintain it in clean and legible condition in conspicuous places on the works.

9. Preservation of register :

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

10. Power of Labour Welfare Officers to make investigation or enquiry :

The Labour Welfare Officers or any other persons authorized by the Govt. of Orissa on their behalf shall have 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 investigate into any complaint regarding default by the contractor, sub-contractor in regard to such provisions.

11. Report of Labour Welfare Officers :

The Labour Welfare Officer or others authorized as aforesaid shall submit report of the results of his investigation or inquiry to the Superintending 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 due be paid to the labourers concerned.

12. *Appeal against the decision of Labour Welfare Officer :*

Any persons aggrieved by the decision and recommendation of the Labour Welfare Officer or other person so authorized may appeal against such decision to the Labour Commissioner within 30 days from the date of decision forwarding simultaneously a copy of his appeal to the Superintending Engineer concerned by 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 to any of his workers or to his agent at a convenient time and place after due notice is received or to the Labour Commission or any other person authorized by the Govt. of Orissa on his behalf.

14. *Submission of return :*

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

15. *Amendments :*

The Government of Orissa 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 Commission or any other person authorized by the Govt. of Orissa in that behalf shall be final.

Clause 34. The term and condition of the agreements have been read/ explained to me

andcertifyclearly understand them.

ADDENDUM TO CONDITION OF CONTRACT

2. TIME CONTROL.

2.1 Progress of work and re-scheduling programme.

- 2.1.1.** The Superintending 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, $\frac{1}{4}$ th of the whole of the work before $\frac{1}{4}$ th of the whole time allowed under the contract has elapsed, $\frac{1}{2}$ of the whole of the work before $\frac{1}{2}$ of the whole time allowed under the contract has elapsed, $\frac{3}{4}$ th of the whole of the work before $\frac{3}{4}$ 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 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 showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work including any changes to the sequence of the activities.
- 2.1.6** The Engineer-in-charge's approval of the programme shall not alter 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 indicate 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.

- i. For
- ii. Abnormally bad weather or –
- iii) Serous loss or damage by fire or
- iv) Civil commotion, local commotion of workmen, strike or lockout, officers any of the heads employed on the work or
- v) Delay on the part of other contractors or tradesmen engaged by Engineer-in-charge, in executing work not forming part of the contract.
- vi) 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 incur additional cost or
- vii) 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 Superintending 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 compensation @1. 5% per month of for delay of work, delay to be computed on per day basis.

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 item 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 Clause-6 of percentage rate P1 Agreement

Rescission of component amendment as per Lr. No. 10639 dt. 27.05.2005 of Works Department, Odisha.

To rescind the contract of (which recession notice in writing to the contractor under the hand of the Superintending Engineer shall be conclusive evidence) 20% of the value of left over work will be realized from the contractor as penalty.

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 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 – III

SPECIAL CONDITION OF CONTRACT

NO RELATIONSHIP CERTIFICATE

Certified that I / We am / are not related to any officer of the Water Resources Department in the rank of Assistant Engineer and above or any officer in the rank of Assistant Secretary and above.

CONTRACTOR

List of Relatives of the tenderer serving in Water Resources Department.

SI No	Name of the Relatives	Rank	Place of present posting with Office / Division of the Department.
1	2	3	4
1.			
2.			
3.			
4.			
5.			

(Vide Para - 7 of Appendix P - 33 of P.W.D. Code Vol. II)

ANNEXURE - I

DETAILS OF OTHER WORKS TENDERED FOR AND WORKS IN HAND AS ON THE DATE OF SUBMISSION OF THE TENDER

SI No	Name of works with No & dt of agreement & Division / Deptt. Concerned.	Place & Country	Works in Hand			Works Tendered for.			Remarks.
			Tendered Cost	Cost of Work remaining to be executed	Anticipated date of completion	Estimated cost.	Date when decision is expected	Stipulated date and period of completion.	
1	2	3	4	5	6	7	8	9	10
1.									
2.									
3.									
4.									
5.									
6.									

CONTRACTOR

65

SUPERINTENDING ENGINEER

ANNEXURE - II

DETAILS OF WORK SIMILAR TYPE AND MAGNITUDE CARRIED ON BY THE TENDERER IN THE PAST.

Sl No.	Name of works with No & dt of agreement & Division / Deptt. Concerned.	Place & Country	Tendered Cost.	Time in which completed.	Date of completion.	Principal features.
1	2	3	4	5	6	7
1.						
2.						
3.						
4.						
5.						

CONTRACTOR

65

SUPERINTENDING ENGINEER

ANNEXURE - III

**CERTIFICATE TO BE ISSUED BY THE SUPERINTENDING ENGINEER
UNDER WHOM THE MACHINERIES/EQUIPMENTS ARE DEPLOYED**

(Not issued prior to 90 days of receipt of tender)

Sl.No	Name of the machineries/ equipments	Identification No/engine/chassis No	Capacity	Year of purchase	Condition working/ break down	Since when deployed under him	When it is likely to be released from current assignment.
1	2	3	4	5	6	7	8

Certified that –

1. I have verified the ownership documents with the identification no of the Machineries /equipments.
2. Machines are currently utilized exclusively for the work under the Division.
3. The facts provided are true as on the date of issue of this documents to the best of my knowledge.

CONTRACTOR

65

SUPERINTENDING ENGINEER

Annexure - IV
PERFORMANCE RECORD OF CONTRACTORS

(Duly certified by the Superintending Engineer under whom he has executed works in order to judge his past performance)

1. Name of the contractor :-
2. Registration No. & Date :-
3. Class of contractor :-
4. Licensing authority :-
5. License valid up to :-
6. Details of work executed :-

SI No	Jobs under execution	Agreement amount	Date of commencement	Stipulated date of completion	Whether work is progressing as per programme	Reasons for delay if any

CONTRACTOR

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SUPERINTENDING ENGINEER

7. Whether the contractor has requisite machineries & personnel deployed(details of machineries & personnel deployed) :-
8. Whether the quality of construction is satisfactory :-
9. Whether he has capability to make good the less time :-
10. Whether the contractor has abandoned any work in the past three years, if yes, the details thereof :-
11. Whether the contractor has entered in to any litigation in the past if yes, the details thereof :-
12. Name of the Certifying Officer
With official seal

Signature of the contractor

CONTRACTOR

SUPERINTENDING ENGINEER

UNDERTAKING BY THE CONTRACTOR

I do here by undertake that I will pay minimum of Rs. 472.00, 522.00, 572.00 & 622.00 to the Un-Skilled Mulia, Semi Skilled Mulia, Skilled Mulia & High Skilled Mulia respectively as fixed by Government from time to time per day to the labourers engaged by me.

Contractor

CHAPTER – IV

TECHNICAL SPECIFICATION

CHAPTER - (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) <u>CEMENT</u>		
1.	Specification to ordinary and Low heat Portland cement	269-1976
2.	Specification for Portland Pozzolana Cement	1489-1976
3.	Portland Slag Cement	(Third revision) 455-1976
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) <u>AGGREGATES</u>		
1.	Specification for coarse and fine Aggregates from natural source for concrete	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
(I II) <u>STEEL</u>		
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 are 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
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 works 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	1791-1963
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.	From vibrators for concrete	4656-1968
22.	Concrete batching and mixing plant	4925-1968
23.	Ready mixed concrete (First 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
29.	Method of making curing and determining compressive strength of accelerated cured concrete test specimen	9013-1978

(V) EARTH WORK

1.	Method of Measurement of building and Civil Engineering Works Part I, Earthwork.	1200-1969 (Part-I)
2.	Safety code for piling and other deep foundations	5121-1969
3.	Code of practice for Design installation, observation and Maintenance of uplift pressure pipes for Hydraulic structures on permeable foundation.	6532-1972
4.	Safety code for excavation works	3764-1966
5.	Code of practice for protection of slope for Reservoir embankment	8237-1985
6.	Code of practice for earth work on canals	4701-1982
7.	Guidelines for lining of canals in expansive soils	9451-19
8.	Method of test for soils Part-II Determination of water concrete	2720-1973 (Part-II)
9.	Method of test for soils Determination of water content dry density relation using light compaction.	2720-1974 (Part-VII)
10.	Method of test for soils determination of dry density of soils in place by the sand replacement method	2720-1974 (Part-XXVIII)
11.	Method of test for soils determination of dry density of soils in place by the core cutter method	2720-1975 (Part-XXIX)
12.	Classification and identification of soils for general	1498-1970
13.	Safety code for blasting and related drilling operation with Amendment No. I (Reaffirmed 1978)	4081-1967
14.	Portable Pneumatic drilling machine (First revision)	5441-1986
15.	General requirement for black hold drilling rigs	7209-1974
16.	Safety code for working with construction machinery	7293-1974
17.	Code of practice for stability analysis of earth dams	7894-1975
18.	Guidelines for design of under seepage control measures for earth and rock fill dams	8414-1977
19.	Filtration media sand and gravel	8419-1977 (Part-I)
20.	Guidelines for design of large earth and rock fill dams	8826-1978
21.	Under drainage arrangements of lined canals.	4558-1995
22.	Precast cement concrete stables for canal lining	3868-1966

23.	Methods of tests of soils	2720 (Part-1 to X)
24.	Ammonium nitrate for explosive	4668-1967
25.	Method of test for commercial blasting explosives and accessories.	6609 (Part-1 to V)
26.	Detonators	7632-1975
27.	Method of load test on soils (Second revision)	1888-1982
28.	Method for standard penetration test for soil (first revision)	2131-1981
29.	Glossing of terms and symbolic relating to soil engineering.	2809-1972
30.	Method of sampling and preparation of stabilized soils for testing	4332 (Part-I of 1967)
31.	Test in over burden	5529 (Part-1 of 1969)

(VI) 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

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|-----|--|---|
| 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 |

(VII) STONE PITCHING AND LAUNCHING APRON

- | | | |
|-----|--|---------------------------------|
| 1. | Methods of test for determination of strength properties of natural building stone. | IS: 1121-1975
(Part-1 to 4) |
| 2. | Method of test determination of true specific gravity of natural building stone (First revision) | IS: 1122-1974 |
| 3. | Method of identification of natural building stone (1st Revision) | IS: 1123-1975 |
| 4. | Method of test for determination of water absorption apparent specific gravity and porosity of natural building stone (1st revision) | IS: 1124-1974 |
| 5. | Method of test for determination of weathering of natural building stones (First revision) | IS: 1125-1974 |
| 6. | Method of test for determination of durability of natural building stone (First revision) | IS: 1126-1974 |
| 7. | Recommendations for dimensions and workmanship of natural building stones for masonry work (First revision) | IS: 1127-1970 |
| 8. | Recommendation of dressing of natural building stone (1st. revision) | IS: 1129-1972 |
| 9. | Sand for plaster (First revision) | IS: 1542-1977 |
| 10. | Code of practice for construction of stone masonry | IS: 1597-1967 |
| 11. | Rubble stone masonry | IS: 1597-1967
(Part 1 to II) |
| 12. | Method for determination of resistance to wear by abrasion of natural building stones (First revision) | IS: 1706-1972 |
| 13. | Sand for masonry mortars (First revision) | IS: 2116-1980 |
| 14. | Code of practice for preparation and use of masonry mortars (First revision) | IS: 2250-1981 |
| 15. | Stone facing | IS: 4101-1967
(Part-I) |
| 16. | Method of test for determination of water transmission rate by capillary action through natural building stones | IS: 4121-1967 |
| 17. | Method of test for surface softening of natural building stones by exposure to acidic atmospheres | IS: 4120-1967 |
| 18. | Methods of test for determination of permeability of natural building stones (First revision) | IS: 4348-1973 |
| 19. | Method of test for toughness of natural building stones | IS: 5218-1969 |
| 20. | Gujarat State, Section 2, Engineering properties of building stones | IS: 7779-1975
(Part1/Sec.2) |
| 21. | Recommendation practice for quarrying stones for construction purpose. | IS: 8881-1977 |

(VIII) ROAD WORK

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|----|---|--------------|
| 1. | Paving bitumen (revised) (with Amendment No.1) | IS: 73-1961 |
| 2. | Cut back bitumen (Revised) | IS: 217-1982 |
| 3. | Glossary of terms relating to bitumen and tar(2 nd revision) | IS:454-1961 |
| 4. | Digboi type cut back bitumen (revised) | IS: 454-1961 |

5.	Distributors for hot tar and bitumen (first revision)	IS: 2093-1974
6.	Heaters for tar and bitumen (first revision)	IS: 2094-1974
7.	Hot asphalt mixing plants (with amendment No.1)	IS: 3066-1965
8.	Bitumen emulsion for roads (anionic type)	IS: 3117-1965
9.	Asphalt pavers' finisher (first revision) (with amendment No.1)	IS: 3251-1965
10.	Bitumen drums	IS: 3575-1977
11.	Recommendations on stacking and storage of construction materials at site (first revision)	IS: 4082-1977
12.	Bitumen mastic for bridge decking and roads	IS: 5317-1969
13.	Method of test for determining aggregates impact value of soft coarse aggregates.	IS: 5640-1970
14.	Safety code for construction involving use of hot bituminous materials.	IS: 5916-1970
15.	Method of test for determination of stripping value of road aggregates.	IS: 6241-1971
16.	Coarse aggregates for water bound macadam (first revision)	IS: 6579-1981
17.	Adhesive, bitumen emulsion	IS: 7393-1974
18.	Code of practice for road gullies	IS: 774-1975
19.	Bitumen emulsion for roads (Cationic type)	IS: 8887-1976
20.	Methods for testing tar and bituminous materials	IS: 9381-1976
21.	Method for testing tar and bituminous materials Determination of effect of heat and air by thin film over test..	IS: 9382-1979

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.

CHAPTER – 2

SITE OF WORK

2.1 DISCHARGE RECORDS

2.1.1. DISCHARGE

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 (that is Govt. of Orissa) 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

- (A) 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 .interval 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. (1) x 30 cm (b) x 75 cm (d) 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.
- (B) Before starting any work and running 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. The centerline 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 bud belled on the ground with the numbered concrete/masonry RD pillar suitably spaced.
- (C) Center line of the canal shall be marked by fixing pillar/stone at 30M intervals profiles of the canal in filling and in moderate cutting shall be marked at 50 M. intervals in straight reaches and at 25M. intervals in curves. A reference line shall also be marked on ground away from then outer edges of cutting and filling with pillars at suitable intervals for future reference.
To ensure correctness of execution, the edges of cutting the outer toe lines of canal in filling should be marked by fixing pillars or pegs at suitable intervals or by dug belling.
- (D) The check profiles shall be located 15 meter 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 or profiles 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.
- (E) 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 2m. beyond the location of catch water drains.

- (F) 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.
- (G) 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 states of the construction, shall be supplied by the contractor at his own cost. The cost of such works shall be deemed to have included in the cost of items in schedule.

2.3 CLEARING AND GRUBBING:

A. 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 'C' 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.

B. 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. 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. Trees to be preserved will be designated by the Engineer-in-charge.

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 property of Govt. and shall be disposed of 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 leveled off as directed.

PREPARATION OF BED;

Ant hills shall be completely dug out before earth work is started. Loose stones and digging of anthills 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 provided for all items to be done under his earth work tender rate. Old bunds will be benched or sloped as directed by Engineer-in-charge before addition of earth, the benches being 500 mm x 500 mm unless other sizes are specified. 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.

C. DISPOSAL OF CLEARED AND GRUBBED MATERIAL.

The disposal of cleared and grubbed materials shall be in accordance with clause 4.1.1. of IS 470-1982 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 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.

D. PAYMENT

For the clearance of light jungles, heavy jungle with or without uprooting etc., payment will be made as provided for in the bill of quantities. Separate payment will be made for clearing of site and grubbing including disposal of the cleared and grubbed materials required under the above paras 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 meter 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 1(one) running mtr. of bench at the rate provided for in the tender documents.

2.4.1: USE OF WATER:

2.4.1 WATER FOR DUST ABETMENT.

A. GENERAL

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:

A. GENERAL

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 follows 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.

2.5.2 DRAINS, BERM DRAINS AND DOWEL BANKS:

A. 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.

B. BERM DRAINAGE AND DOWEL BANKS:

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

The surface of the berms shall be sloped transversely and dowel banks shall be made along with sides of the banks and berms 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.

Payment will be made for constructing Dowel banks and sloping berms and cost there of shall be included in the unit price per cubic meter bid in the bill of quantities for construction for canal embankment including reconstructing and remodeling.

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:

Payment for removal of silt will be made as provided in bill of quantities. 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 30m intervals longitudinally along the alignment of the canal. The level points transversely along the cross sections shall be maximum at 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 mtr 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 Superintending 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 mtr.

CHAPTER- 3

EARTH WORK

3.1. EARTH WORK – GENERAL

To the extent that they exist, plans and estimates for the Government's studies of Earth Work for construction of the canal will be available for inspection by the Bidders in the office of the concerned Engineer-in-charge. Such information is made available solely for the convenience of Bidders. The Government does not guarantee that the information is accurate or complete. Bidders are cautioned that this information is subject to revision and that the Govt. disclaims responsibility for any interpretation, deduction or conclusions, which may be made there from. It is not intended that this information will limit or prescribe the excavation and handling procedures of the contractor, and the Govt. reserves the right to utilize and distribute earth work materials during the progress of work it serves the interest of the Govt.

Drawing showing the typical section of the canal annexed to these specifications provides such details as would enable the contractor to execute the work in general conformity there-with under these specifications which have been prepared as definitely and in as much detail as possible with regard to design data presently available. These drawings will be supplemented by such additional, general and details drawings or directions as may be considered necessary or desirable as the work progresses. For all changes in approved drawing/design the recommendation of Superintending Engineer and approval of Chief Engineer will be essential. Where details shown on these drawings differ from the requirements of these specifications. The requirement of specifications shall govern. The contractor shall do no work without proper drawings. He shall check all drawings and specifications carefully and advise the Engineer-in-charge if any errors and commissions are discovered where upon the Superintending Engineer will prepare and lodge such revised additional drawings and specifications as may be required to suit the stage of the work. All such additional general and detailed drawings whether original or revised lodged in the office of the Engineer-in-charge and signed by him for purpose of identification shall be open for inspection by the contractor under the same terms and conditions as provided in agreement.

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 purpose of relevancy or otherwise of any provision of the I.S. Code referred to the decision of the Engineer-in-charge.

3.2. EXCAVATION OF CANAL AND FOR STRUCTURES:

3.2.1. CLASSIFICATION OF EXCAVATION.

Payment shall be made on actual classification of soil met with during excavation. Materials excavated shall be measured in excavation to the lines shown on the drawings or as provided in these specifications, and all materials required to be excavated will be paid for at the applicable rates in the schedule for excavation. No additional allowance above the rates in the schedule will be made on account of any of the material being wet. Bidders and the contractors must assume all responsibility for deducing and concluding as to the nature of the materials to be excavated and the difficulties of making and maintaining the required excavations. The classification of excavation shall be decided by the Engineer-in-charge and binding on the contractor. In case of dispute, the decision of SE. shall be final. Merely the use of explosive in excavation will not be considered in areas on the higher classification unless blasting is clearly necessary in the opinion of the Engineer-in-charge.

3.2.2. EXCAVATION FOR CANAL

- a) The excavation may be carried out manually or mechanically and as per specification drawing and direction of Engineer-in-charge.
- b) The excavation for canal in all kinds of soil and D.I. Rock shall be done according to the dimensions and grades shown on the drawing, Proud equivalent to thickness of the lining on sides and in bed on the underside of the lining shall be left unexcavated temporarily and the removal of this proud shall be done just before trimming and placing concrete for lining.
- c) Blasting shall be done in such a manner as not to cause over break which in the opinion of the Engineer-in-charge is excessive. Special care shall be taken to prevent over break or loosening of material on bottom and side slopes against which concrete lining is to be placed. The method of drilling and blasting to be resorted to for rock excavation shall be got approved from the Engineer-in-charge.
- d) Except for the area of rock, all areas to be excavated for canal sections shall be pre-wetted so that at the time of excavation moisture content shall be about optimum. However is case the excavated material from canal is not to be used for embankment, such prewetting is not necessary.
- e) The excavation shall be allowed to progress from the valley ends of the reach towards the ridge in conformity with the layout given. All useful earth from excavation shall be used in for filling the banking section, with varying leads and with all lifts either manually or mechanically. Excavated materials which is not useful for banking or which is in excess after meeting the banking requirement of the reach shall be disposed as specified at Para 8.1 of I.S. Code 4701-1982 either by head lead or by mechanical means or by both in spoil bank or at any specified place with all lifts and with varying leads.

- f) The re-gradation for tail channel and approach channel for structures and diversion of drains nallah shall be done according to the dimension and grade as shown on the drawings or as instructed by the Engineer-in-charge.
- g) The contractor shall not be entitled to any additional rate above the rates quoted in the schedule on account of the requirement for allowing additional time for drying, stock piling and re-handling the excavated materials which have been deposited temporarily and stock piled.
- h) When cutting on cross sloping ground the contractor shall cut a catch water drain on the higher side to prevent water from flowing down the cutting slope.

3.2.2.1 EXCAVATION OF SOIL AND DISINTEGRATED (DI.) ROCK.

Excavation of soil shall comprise of all kinds of soil such as vegetable or organic soil, turf, sand, silt, loam, clay mud, peat, black cotton soil, loose or compact moorum, soft stiff/heavy/hard shale, stony earth mixed with gravel having 300 mm maximum diameter in one direction. Excavation of D.I. shall comprise of soling of roads/paths, hard core, macadam surface, lean, concrete, stone masonry, brick work, soft conglomerate, lime stone, sand stone, laterite, hard conglomerate and types of D. I. rock, which does not require blasting and can be quarried or split with pick axe and crow bars. If however the contractor resorts to blasting in such strata and D.I. rocks for his convenience, no extra payment shall be made and the materials shall not be classified in higher grade.

Excavation for canal shall confirm to provisions of relevant I.S. Codes, Sides slopes are to be provided as per the approved drawings, specification and provision of I.S.Code.

3.2.2.2. EXCAVATION OF MEDIUM HARD ROCK.

This shall include all solid rock in place of such hardness and textures that it can not be removed by pick axe and crowbars and only to be removed by means of appropriate blasting. All boulders or detached pieces of solid rocks having volume greater than 0.50 cum, Can be classified as Medium Hard Rock.

The excavated rock and debris so obtained shall be carried and dumped / stacked separately with varying lead at places indicated by the Engineer.

The excavated materials shall be the property of the Department.

Payment for Medium Hard Rock by means of appropriate blasting shall be made as per level section (pre & finished). A closer interval for leveling may be adopted if considered necessary as per opinion of the Engineer-in-charge. Boulders having volume more than 0.5 cum shall be pre-measured.

3.2.2.3 OVER EXCAVATION.

The canal shall be excavated to exact designed section in all kinds of soil and D.I. rock No over excavation will be allowed in such reaches. However in canal sections, taken in Medium Hard Rock formation over excavation to the extent of 10 cm. depth on an average will be allowed and

paid for in the respective item. In case of over excavation beyond 10 cm depth due to poor geological formation certified by the Superintending Engineer and approved by the Chief Engineer payments would be made for removal of such quantity only.

3.2.2.4 DEWATERING TRENCHES AND WET EXCAVATION.

Subsoil water met within canal excavation shall be diverted to nearby drain/nallas by cutting an open channel within the canal section to be excavated, when the drain/nalla bed is higher than the subsoil water level met with, pumping shall be resorted to for dewatering below the drain/nalla bed level. In case where topography of the area is such that surface water is not possible to be drained off by excavating the channel, pumping shall be resorted to till completion of the work. No distinction shall be made as to whether the materials being excavated is dry, moist or wet, care should be taken to discharge the drained water not to cause damage to works, crops or any other property. No separate payment shall be made for dewatering by pumping or by any other method.

3.2.2.5 MEASUREMENT AND PAYMENT

The payment shall be made on volumetric basis for the quantities excavated to the required extent. The cross sections shall be taken initially before commencement of work as stipulated in earlier Para. On completion of excavation, final cross sections shall be taken at the same points longitudinally and transversely. These cross sections shall be marked on the initial cross sections and the quantities between initial and final cross section shall be worked out and paid.

In case of canal excavation in Medium Hard Rock, cross sections, shall be taken at 30 m. interval longitudinally with transverse levels at 5 m. or closer intervals, as decided by the Engineer-in-charge for initial and final sections, isolated boulders having volume more than 0.50cum and not covered in section measurement shall be premeasured.

3.2.3 EXCAVATION FOR STRUCTURES

A. GENERAL:

Excavation for the foundation of structures shall be to the elevation shown on the drawings or as directed by the Engineer –in charge. In so far as practicable the useful materials removed in excavation for structures shall be used for back fill and embankment.

B. FOUNDATIONS FOR STRUCTURES

All trenches in soil other than rock or hard compact soil more than 1.5 m depth in which men enter shall be securely shored and shuttered and timbered. All loose stones, projecting clumps of earth, pockets of materials which might come down on the workers in the trenches or any condition which is hazard, shall be either removed or the excavated sides adequately braced and the trench suitably guarded. On stiff slopes, workmen shall not be permitted to work one above the other.

The contractor shall prepare the foundations of structure site by method which will provide firm foundation for the structures. The bottom and the side slopes of common excavation upon or against which the structure is to be placed shall be finished to the prescribed dimensions and the surfaces so prepared shall be moisten and tamped with suitable tools to form firm foundation upon or against which the structures is to be placed. The contractor shall prepare the foundation of the structures as shown on the respective drawings. The horizontal foundation materials beneath the required excavation shall be moistened if required and compacted in place.

If the Engineer-in-charge considers its necessary to consolidate the foundation strata by grouting cement slurry, then drilling and grouting or any other foundation treatment shall be done by the contractor as directed by the Engineer-in-charge and the payment will be as per the general contract document in respect of extra items. Densities of the compacted foundation materials and the testing there of shall be in accordance with relevant IS specification.

When unsuitable materials are encountered in the foundation for structure the Engineer-in-charge will direct additional excavation to remove the unsuitable materials. The additional excavation shall be refilled as follows. The excavation of soil, the over excavation shall be filled in by selected bedding materials and compacted. In excavation of rock it shall be filled by cement concrete M-7.5. Payment will be made as per unit rate as provided in the bill of quantities. Should remains of old building be met with, the materials shall be removed with wedges and levers. Blasting shall not be allowed, with the permission in writing of the Engineer-in-charge. If bad ground of loose soil is met with the contractor shall responsible for reporting the fact to the Engineer-in-charge who shall issue such orders as may be necessary. For extra excavation, concrete and masonry arising from bad ground, the contractors shall be paid treating this as additional quantity as per the contract rate of contract documents. All excavated earth which is unfit or surplus to the requirements for filling in canal embankments etc. shall be spared, as instructed by the Engineer-in-charge at the contractor's expenses.

C. OVER EXCAVATION:

If at any point in common excavation the foundation material is excavated beyond the lines required to receive the structure, or if at any point in common excavation the natural foundation material is disturbed or loosened during the excavation process, it shall be compacted in place or where directed, it shall be filled by cement concrete M-7.5. Any and all excess excavation or over excavation performed by the contractor for any purpose or reason except as directed by the Engineer-in-charge shall be at the expense of the contractor. Filling for such excess excavation of over excavation shall be at the expense of the contractor.

D. DISPOSAL OF MATERIALS:

All suitable material removed in excavation or as much thereof as may be needed as directed by the Engineer-in-charge shall be used in the construction of canal embankments, roadway embankments and for selected bedding materials or for backfill and around structures. If there is an excess of material in the excavation, it shall be used to strengthen the embankment on either

side of the canal, deposited in low areas uphill of the canal to eliminate trapped drainage or otherwise wasted as directed by the Engineer-in-charge. The disposal of the excavated material shall be in accordance with clauses 8.1 and 8.2 of BIS 4701-1982.

E. MEASUREMENT FOR PAYMENT

Foundation for structures will be measured for payment, as per drawing with due consideration for shuttering. The payment shall be made on volumetric basis for the quantities excavated to the required extent.

F. PAYMENT:

Payment for excavation for structures shall be made at the unit price per cubic metre. The rate of excavation for structures shall include the cost of all labour and materials and other temporary constructions, cost of all pumping and dewatering, cost of all other work necessary to maintain the excavation in good order during construction, cost of removing such temporary construction where required and shall include the cost of disposal of the excavated material.

3.2.4. BACK FILL:

3.2.4.1. BACK FILL AROUND STRUCTURES

A. GENERAL

The item of the schedule for back fill around structures including pipe portions of structures includes all back fill required to place under these specifications.

B. MATERIALS:

The type of material used for backfill, the amount thereof and the manner of depositing the material shall be subject to approval of Engineer-in-charge. In so far as practicable backfill material shall be obtained from material removed from excavation for structures. But when sufficient suitable material is not available from this source or from adjacent canal excavation, additional material shall be obtained from approved borrow areas. The borrow pit excavation shall be in accordance with clauses 9.1 to 9.3 of B.I.S. 4701 - 1982.

Where sand filling is specified, the sand shall be clean, free from admixture of foreign material and approved by the Engineer-in-charge before filling is commenced. Should there be a necessity to fill in a basement with sea sand, prior written approval of the Engineer-in-charge shall be obtained. Sand filling should be saturated with water before the construction is allowed to proceed.

Filling around structures shall have well consolidated in layers of 15 cm. by ramming with iron rammers and cut ends of crowbars. When filling reaches the finished level the surface shall be saturated with water for at least 24 hours, allowed to dry and then rammed and consolidated.

Except as otherwise provided below, backfill material to be compacted shall contain no stones larger than 80 millimeters in diameter and if not be compacted shall contain no stones larger than 130 millimeters in diameter. If the excavation for the foundations of the structure is in swelling soils, a layer of cohesive non-swelling soil conforming to B.I.S. 9451-1985 should be interposed between the swelling soil and the structure.

C. PLACING BACKFILL:

Backfill shall be placed to the lines and grades shown on the drawings as prescribed in this paragraph or as directed by the Engineer-in-charge.

The surface to receive the filling shall be first prepared free from all roots, vegetation or spoil and wetted.

All backfill shall be placed carefully and spread in uniform layers so that all spaces around rocks and clods will be filled. Backfill shall be brought up as uniformly as practicable on both sides of walls and all sides of structure to prevent unequal loading. Backfill shall be placed to about the same elevation on both sides of the pipe positions of the structures to prevent unequal loading and displacement of the pipe. The contractor shall provide at least 60 (Sixty) centimeter thick earth cover over the top of pipe to prevent damage from construction equipment loads. If a haul road is built over a pipe all backfill about and over the pipe shall be placed to a uniform surface and no humps or depressions will be permitted at the pipe crossing.

D. STRUCTURES ON FILL:

Where the original ground surface is below the base of a structure or below the bottom of pipe all fill required for the structure foundation and all fill up to the bottom of the pipe shall be placed as compacted embankment. The embankment over the natural ground up to pipe bottom and over the pipe shall be laid in accordance with clauses 9.2.4, 9.2.5 and 9.2.6 of B.I.S. 783 code of practice for laying of concrete pipe.

E. MEASUREMENT AND PAYMENT

Payment for backfill about structure will be made as provided in the unit price bid therefore in the bill of quantities.

3.4. DRILLING AND BLASTING:

3.4.1. GENERAL

Blasting where required shall be permitted only when proper precaution have been taken for the protection of persons and property in accordance with I.S. 4081 – 1967 (Indian Standard Specification for safety Code for blasting and related drilling operations). While carrying out excavation, adequate precautions in accordance with I.S. 3761-1966 (Indian Standard Specifications for safety Code for excavation work) shall be taken.

All contractors who execute blasting operations in connection with works for purpose of quarrying stones, road construction, excavating foundations, well sinking or for any other purpose shall observe the rules and precautions as per standard norms and any further additional instructions which may be given by the Engineer-in-charge.

3.4.2. PERSONNEL:

Excavation by blasting shall be permitted only under the personal supervision of competent and licensed persons and trained workmen employed by the contractor at his cost. All supervisors and workmen in charge of work of handling, storage and blasting shall be adequately insured by the contractor.

The storage of explosives shall be in charge of a very reliable person of the contractor men. The contractor shall make sure that his supervisor workmen are fully conversant with all the rules to be observed in storing, handling and use of explosives. It shall be assured that the supervisor in-charge is thoroughly acquainted with the details of the handling and the blasting operations.

3.4.3. STORAGE OF EXPLOSIVE:

The contractor shall build at his cost a magazine for storing the explosives and portable magazine for carrying the explosives to work spot from the magazine or one storage magazine to be built near the site of the work on which explosives are to be used.

The explosives, detonators, and fuse coils shall each be separately stored. All required relevant records for above purpose shall be maintained by the contractor as per approved Govt. norms at the cost of contractor and as directed by the Engineer-in-charge.

3.4.4 TRANSPORT AND STORING OF EXPLOSIVE:

For the transport of the explosive and detonators between the store and site, closed and strong containers made of soft materials such as timber, zinc, copper, leather shall be used. Explosive and detonators shall be carried in separate boxes. For the conveyance primer special container shall be used.

The boxes and containers used shall be kept closed. Explosives shall be stored and used chronologically to ensure the one received earlier being used first. A make up house shall be provided at each working place in which cartridge will be mad up by competent and licensed men as required for the work. The make up house shall be separated from to other buildings. Only electric storage battery lamps will be used in this house.

No smoking shall be allowed in the make up house or generally while dealing with explosives.

No child under 16 years of age and person who is in a state of introduction, shall be employed on the loading, unloading or transport of explosive or be employed in or allowed to enter in premises where explosives to are handled and / or stored.

3.4.5. DISPOSAL OF DETERIORATED EXPLOSIVES:

All deteriorated explosives shall be disposed off in an approved manner the quantity of the deteriorated explosives to be disposed off shall be intimated to the Engineer prior to its disposal.

3.4.6 PREPARATION OF PRIMERS:

The primers shall not be prepared near open flames or fire. The work preparation of primers shall always be entrusted to the same personnel. Primers shall be used as early as possible after they are ready.

3.4.7 CHARGING OF HOLES:

The work of charging of holes shall not commence before all the drilling work at them site is completed and the contractor's supervision be satisfied himself to the effect by actual inspection. While charging, open lamps shall be kept away. For charging with powered explosives, a naked flame shall not be allowed. Only wooden tamping rods, without any kind of metal on the rod shall be allowed to be used. The tamping rods shall have cylindrical ends. Bore hole must be of such size that the cartridges can easily pass down them; they shall not be however be too big.

Only one cartridge shall be inserted at a time and gently pressed into the hole with the tamping rods. The sand, clay or other tamping materials used for filling the holes completely shall not be tampered too hard.

3.4.8. BLASTING:

Blasting shall be carried out during fixed hours of the day which shall have the approval of the Engineer. The hours once fixed shall not be altered without prior, written approval of the Engineer.

The site of blasting operations shall be prominently demarcated by red danger flags. The order of fire shall be given only by the Contractor's supervision in charge of the work and his order shall be given by only after giving the warning signal three times, so as to enable all the labour, watchmen, etc to reach safe shelters.

All the roads and foot paths leading to the blasting area shall be watched. Road closing barriers should be provided to close the traffic on these roads at least 400 meters away when the firing is to take place.

In special cases, suitable extra precautions shall be taken. The Engineer may however permit blasting for under ground excavation, without restriction of fixed time, provided that he is satisfied that proper precaution are taken to give sufficient warning t all concerned and that work of other agencies on the site is not hampered. For lighting the fuse, a lamp with strong flame such as carbide lamp shall be used.

The Contractor's Supervisor shall watch the required time for the firing of the fuses and shall see that all the workmen are under safe shelters in good time.

3.4.9 ELECTRICAL FIRING:

Only the contractor's Supervisor in charge shall possess key of the exploder and short firing accessories and he shall keep it always with himself, special apparatus shall be used as a source of current for the blasting operations. Power lines shall not be tapped for the purpose.

The detonators shall be checked before use. For blast in series only detonators of the same manufacture of the same group of electrical resistance shall be used.

Such of electrical lines as could constitute danger for the work of charging shall be removed from the site.

The firing cables shall have a proper, insulating cover so as to avoid short circuiting due to contact with water, metallic parts of rock.

The use of the earth as a return line shall not be permitted.

The firing cables shall be connected to source of current only when no body is in the area of blasting. Before, firing, the circuit shall be checked by a suitable apparatus. After firing whether with or without an actual blast the contact between the firing cables and the source of current shall be cutoff before any one is allowed to leave the shelter.

During storms charging with electrical detonators shall be suspended. The charges already placed in the holes shall be blasted as quickly as possible but taking all the safety precautions and giving necessary warning signals. If this is not possible the sites shall be abandoned till the storm has passed.

3.4.10 PRECAUTIONS AFTER BLASTING:

After the blast, the contractor's supervisor must carefully, inspect the work and satisfy himself that all the charges have exploded. After the blast is taken place in under ground works, workmen shall not be allowed to go to the place till all the toxic gases are evacuated from the face.

3.4.11 MISFIRES:

If it is suspected that part of the blast has failed to fire and delayed, sufficient time shall be allowed to elapse before entering the danger zone. When fuse and blasting caps are used a safe time should allow and then the contractor's supervisor alone shall leave the shelter to see the misfire.

None of the drillers are to work nearer this hole under one of the two following operations have been carried out by the supervisor.

Either (i) the supervisor should very carefully (when the tamping is of camp clay) extract the tamping with a wooden scraper or jet of water or compressed air (using pipe of soft materials and withdraw the fuse with the primer and detonator attached after which a fresh primer and

detonator with fuse should be placed in this hole and fired out or (ii) the hole may be cleared of 300mm of capping and the direction then be ascertained by placing a stick in the hole. Another hole may be drilled at least 225mm away and parallel to it. This hole should then be charged and fired. The balance of the cartridge and detonator found in the much shall be removed.

Before leaving this work, the contractor's supervisor should inform the supervisor of the relieving shift of any case of misfires and should point out the position with red cross denoting the same, also stating what action if any, he has taken in the matter. A register of misfires and their location and how they were dealt with shall be maintained by the contractor.

The contractor's supervisor should also at once report at the contractor's office all cases of misfires, the cause of the same and what steps were taken in connection there with.

The name of the day and night shift supervisors of the contractor must be noted daily in the contractor's office. If misfire has been found to be due to a defective detonator, or dynamite, the whole quantity of box from which the defective article was taken must be returned to the contractor's office for inspection, and shall be disposed off.

Blasting operation, when considered necessary shall be resorted to only with the written permission of the Engineer-in-charge. Prior inspection shall be carried out for the safety and stability of the public and property. Blasting operations in the proximity of overhead power lines, communication lines, utility lines or other structures shall not be carried on until the operator or the owner or both of such lines have been notified and precautionary measures deemed necessary have been taken.

Any damage to the neighboring buildings, properties, standing crops, and life due to blasting shall be made good by the contractor at his cost.

3.5 EMBANKMENTS

3.5.1. PREPARATION OF SURFACES UNDER EMBANKMENTS

The preparation of surfaces under embankment shall be in accordance with clause 6.1 & 6.5 of IS 4701-1982.

Before commencing the work, the toe of the slope on each side of the Banks shall be locks pitted (dog belled) and marked by pegs firmly driven into the ground at intervals of about 15 meter. Profiles made by bamboos, earth, or other convenient materials and strings shall be set up for the guidance of the workmen about 15 meters apart over straight reaches and about 7.5 meters apart at curves & payment therefore will be made at the unit prices.

Exception in areas of rock, the areas under canal embankments shall be pre-wetted by sprinkling water before cleaning, grubbing or excavation of operations or embankments construction begin. The moisture content shall be optimum to a depth of one meter below the original ground surface or to impervious material whichever less as directed by the Engineer is. Whenever possible all water shall be added uniformly in one application. Areas, on the sides of the canal banks upon which the Engineer may direct spoil banks to be constructed will not require application of water.

The contractor is cautioned to control carefully the application of water and to check on the depth and amount of water penetration during application so as to avoid over watering, accumulation of water in depressions or excessive run off.

If at any location on embankment foundations, before and during embankment construction there is excessive moisture as determined by the Engineer, steps shall be taken to reduce the moisture by excavating drains, by allowing adequate drain time or by any other approved means.

The contractor shall not be entitled for any additional allowance above the unit prices bid in the schedule on account of the requirement for allowing additional time for drying, delays or increased closets due to poor traffic ability on the embankment foundations or on the haul roads, reduced efficiency of the equipment the contractor elects to use or on account of any other operational difficulties caused by overly wet embankment foundation or haul roads.

Where the ground surface under any embankment is not suitable as determined by the Engineer for a foundation for the embankment, the contractor shall strip the area under the embankment of such unsuitable material to such depth as may be directed. The material so removed shall be disposed off as provided in paragraph 3.3.4. Measurement for payment of stripping unsuitable materials under embankments shall be made only to the lines and to such depth as may be directed and payment there off will be made at the unit prices per cubic meter bid in the bill of quantities for excavation for canal/construction of embankment.

Before beginning the construction of embankments the surface area of ground to be occupied shall be cleared of all roots and vegetable matter of any kind stripped to a suitable depth. The stumps shall be pulled or otherwise removed, and the roots grubbed. The stumps and roots removed shall be suitable disposed if.

The depth of which top soil is removed shall be adequate to remove all perishable material and any soil which may become unstable on saturation or may interfere with development of proper bond between foundation and embankment. It is not necessary to remove all the soil containing fine hair like roots but only heavy mat. The underline table may offer as a guide for lines for finding depth of stripping.

Type of vegetable cover in the soil	Depth of stripping.
1. Soil containing light grass cover	5.0 to 7.5 centimeters
2. Agricultural Lands	To bottom of ploughed zone 15.0 to 20.0 centimeters

The ground surface under all canal embankments excepting rock surface where it is below the full supply level in the canal shall be scarified making open furrows not less than 20(twenty) centimeters deep below natural ground surface at intervals of not more than 1.0 (One) meter. However, where the ground surface is blow the bed level of the canal the entire surface of the foundation of embankments shall be stripped to a depth of not less than 20 (twenty) centimeters.

Immediately after preparation of the embankment foundation, the contractor shall excavate cut off trenches, following this operation as soon as feasible and as approved by the Engineer the contractor shall place and compact embankment in the cut off trenches and place one metre of embankment over the entire embankment foundation and compact where required. This procedure will seal the foundation against loss of moisture and provide some consolidation of the foundation.

The cost of scarifying the foundation surfaces under the canal embankments and other embankments shall be paid at the unit per cubic meter bid in the bill of quantities for excavation of canal.

Payment for excavation for cut off trenches shall be made at the unit price per cubic meter bid in the schedule of quantities for excavation for canal.

Payment for compacting embankment in the cut off trenches shall be included in the unit price per cubic meter bid in the bill of quantities for watering of embankments.

Water applied for prewetting areas under the canal embankments and under other embankments will not be measured for payment and shall be include in unit price per cubic metre in the bill of quantities for excavation for canal/construction of canal embankment under the canal embankment.

In case of existing canals, where the slopes in canals and embankment portions are to be modified, benching of slopes shall be done or old bunds shall be sloped as directed by the Engineer duly clearing the surface area under slopes from all roots and vegetable matter and stumps shall be pulled or otherwise removed and roots grubbed. The stumps and roots removed shall be suitably disposed off.

The measurement of benching operation if done shall be done separately and the payment shall be made at unit price per running metre bid in the bill of quantities for that item.

3.5.2 CONSTRUCTION OF EMBANKMENTS:

A. GENERAL

Canal embankments shall be constructed to top widths and side slopes as shown on the drawings duly providing for compacted allowance of two cm. per meter height of bank for settlement. The embankment shall be built to heights as directed above those shown on the drawings. The top of all the canal embankments shall be graded to be suitable for a road way in accordance with subparagraph (b) and the top of other embankments shall be graded to scarify as directed.

Before commencing over haul of material from the borrow area, levels of the banks to be formed in the sections where the over hauled material is proposed for construction of embankments shall

be taken. After completing the construction of embankment final cross section levels shall be taken and the volume shall be arrived at and payment shall be made to that quantity only.

All materials shall be deposited in embankments so that cobbles, gravel and boulders are well distributed through other materials and not nested in any position within or under the embankment as enunciated in clause 6.4. of IS 4701 – 1982.

In area where required excavation does not furnish suitable or adequate material for constructing embankment, material shall be obtained from area where material in excess of that required to construct the adjacent embankment is available.

Where the original ground surface is below the grade of the canal and where construction of a fill below the bottom of the canal is prescribed such fill shall be placed as compacted embankment. Where the original ground surface is below the base of a structure, the fill required to form a suitable foundation for the structure shall be placed as compacted embankment.

b. ROADS AND RAMPS:

In conjunction with construction of canal embankments, the contractor shall construct, operate and maintain earth ramps adjacent to the canal and structures where shown on the drawings and where directed at his own expense. Suitable materials obtained from excavation shall be placed on embankment for the roads and ramps. If sufficient material is not available from required excavation the Engineer may direct Excavation from borrow areas.

The width of road shall be provided as shown in the drawing and where the width of road is not shown on the drawings, it shall have a width of not less than 4.2 meters. The work required for construction, operation and maintenance of road and for earth ramps that obtainable with a motor grader provided for safe travel with a two wheel drive automobile in high gear to moderate speed. Special rolling or compaction will not be normally required, provided that if compaction is directed, the embankments shall be compacted in accordance with section 3.6.

c. EMBANKMENTS NOT TO BE COMPACTED:

Embankment not to be compacted shall be formed conforming to clause 6.6.1 of I.S. 4701-1982. The material for these embankments shall have optimum moisture content before earth moving equipment is routed over the embankment. The embankments shall be built in layers not exceeding 30 (thirty) cm. in thickness. Embankments shall be built in approximately horizontal layers carried across the entire width of the embankments to the required slopes. Embankments shall not be widened with loose materials dumped from the top. Embankments may be built by excavation and hauling equipment or by excavating and hauling equipment shall be made in horizontal layers and shall be kept as close to level as practicable. The travel over the embankments during construction shall be routed so as to distribute the compacting effect of the equipment to the best practicable advantage.

DEPOSITING

Spoil from the pits shall be deposited on bank to each sections as are shown on the relevant plans specified or ordered by the Engineer-in-charge. Ramming breaking clods and smooth surface sectioning shall not be necessary, but a spoil banks with a neat straight toe, even slopes and even top surface shall be formed as the depositing proceeds.

Embankment built by excavating machinery depositing the materials directly from the excavation shall be made in horizontal layers having a thickness of 30 (thirty) cm. Finer portions of the materials excavated shall be placed in that part of the embankment nearest to the water and coarser materials shall be placed in the outer part of the embankment.

d) EMBANKMENT TO BE COMPACTED:

The requirements for compacted embankments shall be as specified in section 3.6 All materials in compacting embankments shall be placed moisture and compacted as provided in Section 3.6.

The materials used for compacted embankments shall be suitable materials as determined by the Engineer-in-charge and shall be obtained from required excavation. The materials shall conform to clause 6.4 of IS 47-01-1982.

Before the materials for the 1st layer of embankment is placed, the foundation of the embankment shall be prepared as provided in paragraph 3.5.1 and shall be moistures and compacted in the manner herein after specified for each layer of compacted embankment to be placed thereon. The embankments shall be compacted to the elevation and to the top widths and side slopes shown on the drawings or prescribed by the Engineer-in-charge.

The layers shall be placed in rows approximately parallel to the axis of the bank. The base of embankment at every height is to be made to its full width of each zone as shown in the drawing plus offsets of not less than 0.45 meters beyond the finished profile on either side for compaction. No payment will be made for the off sets or for the subsequent removal, and unit price quoted for the banking is deemed to include this. No additional payment will be allowed to the slope for full design section of the bank after the bank is raised. The embankment shall be compacted to 95% proctors density using pneumatic Tampers, frog rammers or vibratory plate compactor or power roller.

Where the original ground surface is below the bottom of the canal and where compacted fill below the bottom of the canal is prescribed such fill shall be placed as compacted embankment. Where the original ground surface is below the base of structures for where slopping concrete walls or slabs extend above the original ground surface and it is practicable as determined by the Engineer-in-charge to embankments shall be constructed to lines and grades as directed to form suitable foundation for the structure of for the sloping or slabs.

3.5.3. BORROW AREA.

3.5.3.1. GENERAL.

- a. All materials required for the construction of embankment and backfill for cut-off trench and around the structures which are not available from canal excavation, excavation for structure or from excavation of other ancillary works shall be obtained from the designated borrow area within 5 Km after stripping as shown on drawing or as designated by the Engineer-in-charge in consultation with field laboratory. The depth of cut in all borrow areas shall be designated by the Engineer-in-charge and the cuts shall be made up to such designated depths only. Shallow cut will be permitted in the borrow areas if uncertified materials with uniform moisture contents are encountered. Each designated borrow area shall be fully exploited before switching over to the next designated borrow area. Half hazard exploitation of borrow pits shall not be permitted. The type of equipment used and the operations in the excavation of materials in borrow area shall be such as to produce the required uniformity of the mixture of materials for the embankment. The contractor has to arrange borrow earth at his own cost and responsibility. No compensation whatsoever for change in limits and locations of the borrow areas and depth of cut for getting suitable earth shall be paid to the contractor within 5 Km radius of dumping place of embankments in most practical route. The borrow area shall not be designated within a distance of five times the height of embankment from the other toe.
- b. Borrow pits shall be operated so as not to impair the usefulness or mar the appearance of any part of the work of any other property. The surfaces of wasted materials shall be left in a reasonably level and even condition.

3.5.3.2. PREPARATION OF BORROW AREAS:

All areas required for borrowing earth for embankment shall be cleared of all tree stumps, roots, bushes, rubbish and other objectionable materials. Adequate lighting arrangement should be provided by the contractor.

Particulars care shall be taken to exclude all organic matter from the materials to be placed in the embankment. All cleared organic materials shall be burnt to ashes or disposed of as directed. The cleared areas shall be maintained free of vegetable growth during the progress of the work. No payment shall be admissible for preparation of the borrow areas indicated above as this deemed to have been included in unit bid price of earth work in the bill of quantities.

3.5.3.3. STRIPPING OF BORROW AREAS:

Borrow area shall be stripped of top soil, sod and any other objectionable materials to the required depth as directed by Engineer-in-charge. The work may be done manually or with suitable machine. Stripping operations shall be limited only to designated borrow areas. Materials from stripping shall be disposed of in exhausted borrow areas or in the approved adjacent areas as directed. No extra payment shall be admissible for stripping the borrow areas as this is deemed to have been included in the unit bid price for earth work in the bill of quantities.

3.5.3.4. BORROW AREA WATERING/DEWATERING:

- a. Borrow area watering shall be done by the contractor at his own cost wherever necessary preferably 48 hours in advance, so that materials may be carried with adequate moisture and in the manner specified by the Engineer-in-charge.
- b. The initial moisture content of the materials in the borrow areas shall be estimated with the help of field laboratory tests. The optimum moisture content required for the materials in any particular borrow areas shall be obtained from the field laboratory. The additional moisture requirements as determined by the laboratory test shall be introduced into the borrow areas by watering well in advance of the excavation to ensure uniformity of moisture content. All care shall be taken to reduce excessive moisture in any of the locations of a borrow area before or during excavation to secure the materials with moisture content close to the optimum. To avoid formation of pools in the borrow areas during excavation operation, drainage ditches from borrow areas to suitable outlets shall be excavated, wherever necessary. Upon exhausting of all materials or abandoning the borrow areas, the pits shall be fully drained to ensure no ponding of water.

3.5.3.5. HAUL ROADS AND APPROACH ROADS TO BORROW AREA:

Construction and maintenance of approach roads, and haulage roads to quarry area and borrow area will be the responsibility of the contractor. The department will have full right of way to those roads for inspection purposes. Proper road signs as directed have to be provided for safety. For haulage of earth, the contractor shall construct ramps and haul roads of sufficient width along the shortest but most practicable route and shall maintain and illuminate them to a satisfactory manner. Watering of the haul road shall be done by the contractor as often as necessary to prevent raising of dust, formation of cuts and consequent deterioration of the surface. Whenever service roads meant for public traffic traverse through or run close to the borrow area, the contractor shall direct the excavation and haulage operation in such a manner as to ensure uninterrupted use of the service road and safety to the public. At the haul road and service road crossing, the contractor shall install necessary check gates and road signs.

No extra payment is admissible as this is deemed to have been included in the unit bid price for earth work in the bill of quantities being contingent to the main work.

3.5.4. EARTH FILL MATERIALS.

3.5.4.1. HOMOGENEOUS EARTH FILL:

Canal embankment shall be constructed to the top width and side slopes as shown on the drawings. Suitable excavated materials available from the canal cutting, pond cutting, removal of ramps and excavation for structures shall be used for construction of banks. If suitable and adequate materials for constructing embankment is not available for excavations, the desired materials shall be obtained from borrow area designated for the purpose as per the instruction of the Engineer-in-charge.

The planning for execution should be such that all the useful excavated materials are utilized in embankment prior to utilization of borrow earth from outside. The embankment earth shall be borrowed only after getting written instruction of the Engineer-in-charge.

Only suitable materials as per specification shall be excavated, loaded and conveyed to the point of placement in the embankment. Unsuitable materials if conveyed shall be removed and disposed clear of the work site as directed by the Engineer-in-charge at the cost of the contractor. The maximum dimensions of stones, pebbles and rock fragments etc. placed in the outside zone of the embankment shall not be more than 15 cm. and the quantity of such stone shall not exceed 5% of total quantity.

3.5.4.2. ZONED EARTHFILL:

- i) When a embankment section is designed zoned section, the embankment shall be divided into zones within which fill materials obtained from canal excavations having different characteristics are to be placed. Placement of fill within these zones as shown on the drawings shall be performed in orderly sequences and in an efficient and workman like manner. The selected materials shall be filled above the key of lining.
- ii.) Chemical and physical tests of the soil in the embankment shall be carried out to ensure that the soil does not contain soluble lime salt content or cohesion less fines, and quantities harmful to the embankments. The useful materials available from canal excavation, excavation of proud and excavation of structures shall be transported over the required leads, as indicated in the respective items of schedule of quantities and placed in then specified layers for embankment.
- iii) In areas, where suitable and adequate materials for constructing the inner zones of the embankment is not available from the canal excavation and excavation of structures, the materials shall be obtained from the borrow areas fixed for the purpose. The borrow areas shall be excavated to the dimensions and depths actually required and as per the instructions of the Engineer-in-charge.
- iv) The rest of compacted zone in the drawings shall be constructed of materials having required percentage of clay so that it can be compacted at optimum moisture content by suitable compacting equipment, to their maximum dry density. The materials shall be compacted to a density as specified on the drawings and as per standard proctor density. Water tightness of materials shall be checked by carrying out in situ permeability tests. Permeability of impervious materials shall not be greater than 10 cm /sec. The impervious material of inner zone should preferably be free from large size particles. If this is not possible the maximum size of gravels i.e. coarse particles to be permitted shall be 40 mm and in that case gravel corrected density shall be considered for compaction standards. In no case the quantity of gravel shall exceed 10% of total quantity.
- v) The rest of compacted zone may consist of any suitable material which provides support to impervious core under various conditions of saturation and draw down. If silty or sandy materials are used, compaction shall be done by using proper machinery utilizing the principle of vibro-

compaction. The distribution of materials shall be such that the compacted material shall be homogeneous free from cracks, pockets or other imperfections. The maximum dimensions of stone placed in the embankment shall not be more than 15 cm. and the quantity of such stone shall not exceed 5% The excavating and placing operations shall be such that the materials when compacted shall be blended sufficiently to secure the best practicable degree of compaction, impermeability and stability. The materials shall be compacted to a density as specified on the drawings or as directed by the Engineer-in-charge.

3.5.5 PLACING EARTHFILL:

- A. The embankment shall be constructed with earth fill of required materials as per drawing and specification. The fill shall be free from lenses, pockets, streaks or layers of materials differing substantially in texture or gradation from the surrounding materials. Then useful excavated materials shall be classified as impervious and semi pervious by the Engineer-in-charge. Care shall be taken to utilize the impervious materials towards the waterside of the embankment and semi pervious materials towards outer zone of the embankment as per drawing.
- b. Construction of embankment shall begin at the toe of the fill and in no case shall embankment be widened by materials dumped from the top. The materials shall be placed in the earth fill in the continuous horizontal layers not more than 15 cm. In thickness after being rolled as herein specified.

The thickness of the layer shall be adjusted by the Engineer-in-charge, if the contractor satisfies the Department that the particular type of compactors used by him give the required density by carrying out trial compaction and requisite tests. The thickness of horizontal layers after compaction shall not be more than 10 cm. If compaction is performed by mechanical tampers, not more than 15 cm, if by sheep foot roller and not more than 30 cm, if compaction is performed by vibratory or pneumatic rollers or similar equipment. Initially the earth in the embankment fill shall be laid in a greater width than the designed section. Adequate extra width of about 0.6 m on either side of the embankment shall be provided so that the earth fill, up to lines of the finished slopes shall have the required compaction as per the drawing and specification. Such extra width shall be removed and utilized in the upper layers of embankment along with slopes dressing, for which no additional payment shall be made as it is deemed to have been included in bid price of earth work in embankment in the bill of quantities.

The inside proud section shall not be removed if the lining work is not included under the same contract such proud section made out of borrow earth from outside only shall be paid as per bid price of the item in the bill of quantities. No payment shall be made for compaction for such proud section left.

- c. No fresh layer shall be laid until the previous layer is properly watered and compacted as per the requirement. If in the opinion of the Engineer-in-charge, the surface of the prepared foundation or the rolled surface of any layer of earth fill is too dry or smooth to bond properly with the layer of materials to be placed thereon, it shall be moistened or worked with harrow, scarified or other

suitable equipment in an approved manner to a sufficient depth to provide a satisfactory bonding surface before the next succeeding layer of earth fill materials is placed. If the rolled surface of any earth fill is found to be too wet for proper compaction of the layer of earth fill materials to be placed thereon. It shall be raked up and allowed to dry or be worked with harrow. Scarified or any other suitable equipment to reduce the moisture content to the required amount and then it shall be compacted before the next succeeding layer of earth fill materials is placed.

- d. The materials shall be deposited in rows parallel to the axis and spread in the uniform layers and shall be broken clods maximum up to 5 cm. in thickness or such thickness as directed by Engineer. The work of spreading and compaction shall be so adjusted as not to interfere with each other and in such a way that neither of the operations is held up because of non completion of rolling and watering. The excavation and placing operation shall be such that the materials when compacted shall be blended sufficiently to secure the best practicable degree of compaction, impermeability and stability. If the work is held up due to failure of machinery no claim whatsoever shall be entertained even in case the machinery is supplied by Department.

The surface of banking shall at all time of construction be maintained true to required cross section.

- e. During construction a small transverse slope from center towards edges should be given to avoid pools of water forming due to rains.
- f. When compacting the soil against the rock abutment or walls of masonry or concrete structures, the construction surface of the embankment shall be sloped away from the rock or masonry or concrete structure leaving a minimum distance of 0.6 m and at an inclination of 3:1. If the foundation surface is too irregular to allow the use of large roller directly against the structure or rock out crop, the roller shall be used to compact the soil, as close to the structure or the out crop as possible and the portion of the embankment directly against the rock or the structure shall be compacted with pneumatic hand tampers in thin layers. The moisture content of the earth fill placed against the rock or the structure shall be slightly above the optimum to allow it to be compacted into all irregularities of the rock and this shall be determined by the field laboratory. In placing the earth fill under rock foundation the foundation shall first be prepared as detailed earlier.
- g. Care shall be taken in placing the first layer of the fill above the filter layer so that no damage is caused by the hauling machinery. Sheep foot rollers shall not be employed for compaction till over the filter the thickness of the layer compacted by other means is greater by 30 cm. than the teeth of the roller drum. The soil for the first layer shall be at moisture content sufficient to enable satisfactory bonding of the fill with the filter surface.

3.5.6. WEATHER CONDITIONS:

- a. Embankment materials shall be placed only when the weather conditions are satisfactory to permit accurate control of the moisture content in the embankment materials. Before closing work on embankment, in any continuous reach prior to setting of monsoon, the top surface shall

be graded and rolled with a smooth wheeled roller to facilitate run off. Prior to resuming work, the top surface shall be scarified and moistened or allowed to dry as necessary and approved by the Engineer for resumption.

- b. The contractor shall provide suitable protection works to protect the slope from corrosion due to rain water. No payment whatsoever shall be made for providing such protection work and rectifying the monsoon damages.

3.5.7 MOISTURE CONTROL :

The water content of the earth fill materials prior to and during compaction shall be distributed uniformly throughout each layer of materials and it shall be between 2% to +2% of the optimum moisture content. Moisture determination of soil as well as needle moisture determination of soil shall be carried out as per I.S. 2720-1983

Laboratory investigations may impose some restriction on the lower limits of the practicable moisture contents on the basis of studies on consolidation characteristics of soil in embankment. Here in after the terms range of optimum practicable moisture content shall refer to the value as described above. As far as practicable, the materials shall be brought to the proper moisture content in the borrow area before excavation. If additional moisture is required it shall be added preferably at the borrow area and only in limited cases/extent. If required, on the embankment by sprinkling water before rolling of a layer. If more moisture is present than required, the material shall be spread and allowed to dry before starting rolling. Moisture control shall be strictly adhering to. The moisture content shall be relatively uniform throughout the layer of material, if necessary, ploughing, disc harrowing or blending with other materials may have to be resorted to obtain uniform moisture distribution. If the moisture content is more or less than the range of optimum practicable moisture content or if it is not uniformly distributed throughout the layer, rolling and adding of further layer shall be stopped. Further work shall be started again only when the above conditions are satisfied.

In order to have proper control of moisture content in the earth fill no earth work shall be done during rainy days. No compensation shall be made to the contractor due to held up to work for rain or fog.

3.6 COMPACTING EARTH MATERIALS.

3.6.1. GENERAL.

Where compacting of earth materials is required the materials shall be deposited in horizontal layers and compacted as specified in this paragraph. The excavation, placing moistening and compacting operations shall be such that the materials will be uniformly compacted to the required density throughout the required section, and will be homogeneous, free from lenses, pockets, streaks, voids, laminations or other imperfections.

Having decided on the filling materials to be used standard compaction test will be conducted on the materials proposed for embankment to indicate best type of equipment to be used and the moisture content at which compaction should be done, thickness of layer and number of passes etc.

The following guide lines are prescribed for compaction of different height of earth fill in canals.

A. *Earth fill up to 5 M. height:*

- a. When a finished reach of canal having an earth fill height upto 5 M is subjected to natural compaction by rain and own weight for two seasons or more before it carries irrigation water no compensation is required to be done.
- b. When it is expected to carry water just after one season, compaction by dozer track chain is to be done. However this is not necessary if the earth fill could be subjected to profuse watering during laying of each layer.
- c. If the canal will be used immediately for carrying irrigation water, compaction by sheep foot roller or by any approved method shall be done.

B. *Earth fills height more than 5 M.*

Canal reaches having earth fill height more than 5 m shall always be compacted by any approved method of compaction.

C. *Moisture control.*

The water content of the earth fill material prior to and during compaction shall be distributed uniformly throughout each layer of materials and it shall be between -5% to +2% of the optimum moisture content. As far as possible and practicable the moisture content of the materials should be brought to required level by watering of borrow area before excavation. If additional moisture is required the same should be sprinkled while laying the earth fill in layers, if the moisture content is greater than required the material shall be allowed to dry and if necessary, ploughing, blending with other materials may have to be resorted to obtain uniform moisture distribution . In order to have proper control of moisture in earth fill, no embankment shall be constructed during rainy days.

3.6.2 COMPACTING CLAY AND SILTY MATERIALS.

Where compaction of earth materials containing appreciably amount of clay or silt is required the compaction shall be carried out in accordance with the clause 6.6.2 of IS 4701-1982. The materials shall be deposited in horizontal layers. The thickness of each horizontal layer before compaction shall not be more than 25 cm. (Loose layer) and the layer shall be to full width of the embankment. The excavating and placing operation shall be such that the materials when compacted will be blended sufficiently to secure the highest practically density and best impermeability and stability. If the surface of any compacted layer of earth fill is too dry or too smooth to bond properly with the layer of materials to be placed thereon , it shall be moistened

and or scarified in an in an approved manner to provide a satisfactory bonding surface before the next succeeding layer is placed. The entire roller used on any one layer of fill shall be of the same type and same weight.

Prior to and during compaction operations, the embankment materials shall possess optimum moistures contents as required in clause 6.6.4 of IS 4701-1982. The embankment materials shall have optimum moisture content required for the purpose of compaction and this moisture content shall be fairly uniform throughout the layer. In so far as practicable the moistening of the material shall be performed at the site of excavation but such moistening shall be supplemented as required by sprinkling water at the site of compaction if necessary. If the moisture content is greater than optimum for compaction, the compaction operations shall be delayed until such time as the materials has dried to the optimum moisture content or to the level directed by Engineer-in-charge. The moisture content of soils shall be determined in accordance with I.S 2720(Part-III) 1982.

If the moisture content is not within then limit described above, the compaction operation shall not be proceeded except with the specific approval of the Engineer-in-charge., until the materials has been wetted or allowed to dry out, as may be required to obtain optimum moisture content, and no adjustment in price will be made on account of any operations of any operation of the contractor in wetting or drying the materials or on account of any delays occasioned thereby.

When the materials has been conditioned as herein before specified, it shall be compacted by rollers or by hand or power tampers. Where hand or power tampers are used to compact soils in confined areas such as under pipes and at the joints of bank connections with the structures, they shall been equipped with suitably shaped heads to obtain the required density.

The dry bulk density of the soil portion in compacted embankment materials shall be not less than 95% of the maximum dry bulk density at optimum moisture content obtained in accordance with I.S. 2720 (Part-VI) 1980 Indian Code of Practice for determination of moisture content, dry density relation using light compaction.

The dry density of soil in field shall be determined in accordance with I.S. 2720 (Part – XXVIII) 1974. Indian Code of Practice of determination of soil in pace by sand replacement or by I.S. 2720 (Part – XXIX) 1975 Indian Code of Practice for determination of dry density of soils in place by the code cutter method.

Moisture content of soil shall be determined in accordance with I.S. 2720(Part-II) 1973Indian Code of Practice for determination of moisture content.

The optimum moisture content is the moisture content that corresponds of the laboratory maximum dry density determined in accordance with I.S. 2720 (Part – VII) 1973.

The above compaction tests will be conducted by contractor in the presence of departmental officers at the cost and the contractor shall ensure compaction, till the Engineer-in-charge or his authorized representative is satisfied that the maximum dry density at optimum moisture content is obtained and permits the laying of next layer.

3.6.3 COMPACTING COHESIONLESS MATERIALS

Where compaction of cohesion less, free draining materials, such as sands and gravels is required the materials shall be deposited in horizontal layers and compacted to the relative density specified below. The excavating and placing operation shall be such that the materials when compacted will be blended sufficiently to secure the best practicable degree of compaction and stability. Water shall be added to the materials as may be required to obtain the specified density by method of compaction being used.

As envisaged in clause 6.6.2.1 of IS 4701-1982 the thickness of the embankment layer shall not exceed 25 cm. (loose layer) before compaction and it should be spread over the full width of the embankment and compaction shall be done by tampers or crawler tractors or vibrating rollers. If the compaction is performed by Treads of crawler type tractor, surface vibrators or similar equipment the thickness of the layer before compaction shall not be more than 4 cm. If compaction is performed by internal vibrators the thickness of the layer shall not be more than the penetrating depth of the vibrator.

As envisaged in clause 6.6.3.1 of I.S. 4701-1982 the relative density of the compacted materials shall not be less than 70% when tested in accordance with I.S.2720(Part-XIV) k1983 Indian code of practice for determination of density Index (relative density) of cohesionless soils.

3.6.4 COMPACTION COHESIONLESS MATERIALS CONTAININGS SOME CLAY AND SILT:

This sub-paragraph applies only to cohesion less materials and not to cohesive materials, cohesion-less materials containing clay and silt may not be free draining. When compaction of cohesion-less materials containing clay and silt is required, the materials shall be compacted to a dry density in accordance with either sub-paragraph (i) and (ii) below, using whichever test that results in higher dry density of the compacted materials in the placement.

i) Dry density determined using procedure enunciated in I.S. 2720 (Part-VII) 1965 (Indian Code of Practice for termination of moisture content dry density relation using light compaction). Prior to and during compaction operation the materials shall posses optimum moisture content as determined in accordance with clause 6.6.4.1 of I..S. 4701-1982 and the moisture content shall be uniform throughout each layer. Provided that the moisture content is ensured as required in clause 6.6.4 of I.S. 4701-1982 the dry density of take soil portion in the compacted materials shall not be less than 95% of the laboratory maximum soil dry density compacted. The field dry density shall be determined in accordance with I.S. 2720(Part-XXVIII) 1974 or IS 2720 (Part XXIX) k1975.

ii) Dry density using the relative density test as described in I.S. 2720 (Part XIV)1983 Indian Code of Practice for determination of density index (relative density) of cohesion-less soils. The relative density of the compacted materials obtained shall be not less than 70% determined in accordance with clause 6.6.3.1 of I.S. 4701 – 1982 the moisture content shall be Maintained as per clause 6.6.4 of I.S. 4701 – 1982,

3.4.5 ROLLERS AND OTHER COMPACTING EQUIPMENT :

As shown in Appendix C or IS 4701 – 1982 the following compacting equipment may be used for compacting the soils shown against them as detailed below.

Major Division	Sub-group	Suitable type of compacting equipments.
Coarse Well Grained Soils	Well Grained. Gravel, gravel and mixtures little or no fines.	Smooth wheel roller Diesel road rollers of 8 to 10 tones capacity pneumatic tyred Roller vibrating smooth wheel roller
	Well graded gravel sand mixtures with excellent clay binder	-do-
	Uniform gravel with little or no fines.	Smooth wheel roller Diesel road rollers of 8 to 10 tones capacity pneumatic tyred Roller vibrating smooth wheel roller
	Poorly graded gravel and gravel sand mixtures little or no fines.	-do-
	Gravel with fines, silty gravel, clayey gravel poorly graded gravel sand clay mixtures.	-do-
Coarse Grained soils, Sand & sandy clays.	1. Well graded sand and Gravelly sands, little or no fines.	Heavy vibrating plate Frog rammer, power rammer, power roller.
	2. Well graded sand with excellent clay binder.	-do-
	3. Uniform sand with little or no fines.	-do-
	4. Sands with fines silty sands, clayey sands, poorly graded sand clay mixtures.	-do-
Fine Grained Soils: Soil having low compressibility.	1. Silts (in organic) and very fine sands rock flour, silty or clayey fine sands, with slight plasticity.	Smooth wheel roller diesel Road Rollers of 8 to 10 tones capacity power rollers pneumatic tyred roller.
	2. Clayey silts (inorganic)	-do-
Soils having medium compressibility.	1. Organic silts of low plasticity	Sheep Foot Roller
	2. Silty and sandy clays (Inorganic of medium plasticity.)	Frog rammer, power rammer
	3. Clays (inorganic of medium plasticity)	-do-
	4. Organic clays of medium plasticity.	-do-
Soils having higher compressibility.	1. Micaceous or diatomaceous fine sandy and silty soils elastic silts.	Smooth wheel roller diesel Road Rollers of 8 to 10 tones capacity pneumatic tyred roller.
	2. Clay (Inorganic)	-do-
	c. Organic clays of high plasticity.	-do-

The compacting equipment shall conform to relevant India specification belowl.

1. Smooth wheeled roller should conform to IS 5502-1969
2. Sheep Foot roller should conform to IS 4661-1968
3. Pneumatic tyred roller should conform to IS 5501-1969
4. Vibratory plate compactor should conform to IS 5889-1970
5. Vibratory roller should conform to IS 500-1970

The methods of compaction shall conform to clause 7.2.1, 7.2.2.7, 2.3 of IS 4701-1982

Unless otherwise specified compaction shall be done by mechanical compactors like standard sheep foot roller hauled by dozer or tractor. While specifications below provide that equipment of particular type and size is to be used, the use of improved compaction shall be encouraged.

Tampering rollers used for compaction of earth fill shall conform to the following requirement.

A. *Roller drums:*

Double drum sheep rollers shall be used for compaction. Each drum of a roller shall have an outside diameter not less than 142.25 cms. And shall not be less than 122 cm. in length. The space between two adjacent drums when on level surface shall not be less than 30 cms. and not more than 38 cms. Each drum shall be free to pivot about an axis parallel to the direction of travel.

B. *Roller Weight.*

The weight of the roller when fully loaded shall not be less than 7091 Kgs. And the ground pressure when fully loaded shall not be less than 40 Kg/Sq.cm. Appropriate equipment for hauling the rollers should be used which can pull the rollers satisfactorily at a speed of 4 Km. Per hour when drums are fully loaded. The space between the tamping feet shall be kept clear of material striking the drum as the same can reduce the effectiveness of the tamping roller.

D. *Rolling.*

When each layer of materials has been prepared to have the proper moisture content uniformly distributed throughout the materials, it shall be compacted by passing the tampering roller. The exact number of passes for each layer to obtain specific density shall be designated by Field Laboratory tests and tests conducted on the borrowed material. The layers shall be compacted in strips over lapping not less than 0.6 m. rolling shall commence at edges and progress towards centre longitudinally. The roller of loaded vehicles shall travel in a direction parallel to the axis of the canal. Turns should be made carefully to ensure uniform compaction. Rollers shall always be pulled.

3.6.6. TAMPING.

Roller will not be permitted to operate within one meter of concrete and masonry structures in the following location where compaction of the earth fill materials by means of roller is impracticable or undesirable the earth fill shall be specially compacted as specified further below.

- i. Porticos of the earth fill in embankment adjacent to masonry structures and embankment foundation designated on the drawing as specially compacted earth fill.
- ii Earth fill embankment adjacent to steep abutments.
- iii Earth fill at specially designated location.

Earth fill shall be spread in layers of not more than 10 (ten) cms. in thickness when loose and shall be moistened to have the required moisture content as specified. When each layer of materials has been conditioned to have the required moisture content, it shall be compacted to the specified density by special rollers, pneumatic/ hand tampers or by other approved methods. The moisture control and compaction shall be equivalent to that obtained in the earth fill actually placed in the embankment in accordance with specifications.

3.67 TESTING:

Density tests shall be carried out after rolling to ascertain the state of compaction which should be measured in terms of dry density. Standard proctor density tests shall be carried out at regular intervals to account for variations in the borrow area material. Not less than three tests shall be conducted to indicate variation in the standard Proctor density attained in the laboratory.

Density tests shall conduct from time to time at site to ascertain whether compaction is attained as specified. For every 1500 cum of compacted earth fill, at least one field density test shall be conducted. However, minimum four density tests shall be made per day irrespective of quantity of earth work. In case the tests show that the specified densities are not attained, suitable action shall be taken either by moisture correction or by additional rolling, so as to obtain the specified density which shall be checked again by taking fresh tests at the same locations. The test locations should be so chosen as to represent the whole layer under test. Each layer should be tested for proper compaction before a fresh layer is allowed over it.

The density to be attained after compaction should be at least 95% of proctor density predetermined by Laboratory tests.

3.6.8. SETTLEMENT ALLOWANCE:

In the mechanically compacted earth fill, settlement allowance of 2% should be provided. In case of earth fill of canal which has not been mechanically compacted, settlement allowance at 10% should be provided & Settlement allowance shall be calculated after embankments are subjected to natural compaction of one full monsoon rains. For short duration works, settlement allowance at 16% should be provided & necessary adjustments are to be made to take care of natural settlement due to rains. Accordingly extra height should be provided taking the settlement into account. Settlement allowance at 2% should be provided after embankments are subjected to natural compaction for two or more full monsoon rains. The base width of the embankment shall not be increased to maintain the design slopes indicated in the drawings for additional height as settlement allowance, but the following procedure shall be adopted.

Settlement allowance shall be calculated at various levels and the elevation including settlement allowance shall be derived keeping the embankment width at the designated levels unchanged. The edges of the embankment at the increased elevations (including settlement) when joined with the point where the slope has changed earlier below, shall give the slope to be adopted for construction.

3.6.9. SLOPE DRESSING.

The slopes for particulars reach of the canal which has been completed in the manner described earlier shall be dressed neatly to the designated line and grade. Extra earth works done at sides are to be dressed and reused in the embankment.

3.6.10. MEASUREMENT AND PAYMENT

The cost of the compacting earth materials as described in this paragraph shall be paid separately in the price bid in the bill of quantities for watering and compacting earth work in canal embankment under these specifications. The unit rate of this item shall be for unit volume of earth fill watered and compacted. No extra payment shall be allowed for labourers engaged for collecting of samples for testing and rectification during compaction as may be required.

CHAPTER - 4

CONCRETE WORKS

4.1 CONCRETE STRUCTURES.

4.1.1. CONCRETE IN STRUCTURES.

- a. Concrete in structures shall conform to the requirements of paragraphs 4.2.1.

4.1.2. CONSTRUCTION OF STRUCTURES:

The item of the schedules for concrete in the structures including all cast in place concrete in the structure.

Cast-in-place concrete for the structures includes all cast-in-place concrete in the structure.

Cast-in-place concrete for the structures shall conform to the requirement of section 3.2 pipe and fitting miscellaneous metal work, mechanical and electrical equipment and other items forming a part of the structures are provided for elsewhere in these specification.

The structures will be located at various points along the canal as shown on the drawings or as otherwise designated.

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 adopt the structure to the conditions disclosed by the excavation or to meet other conditional. Where the thickness of any portion of a concrete structure is variable it shall vary uniformly between the dimensions shown.

Where necessary as determined by the Engineer-in-charge the contractor shall furnish additional details drawings of the structures to be constructed.

The cost of furnishing all materials and performing all work for installing timber, metal and other accessories for which specific price are not provided into 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:

A. GENERAL:

Concrete shall be composed of cement, sand, coarse aggregate, water admixtures (if any) as specified and all well mixed in batching plant by weight or by concrete mixture by volume and brought to the proper consistency. Batching plant shall conform to IS Code No. 4925-1968

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

MIXING:

Concrete shall be mixed in a mechanical mixer and shall be as dense 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 table 1 of IS 457-1957 reproduced below.

Capacity of Mixer	<u>Minimum time Mixing</u>	
	Natural Aggregates	Manufactured Aggregates.
All mixture	2 minutes	2-1/2 minutes.

B. NOMINAL MAXIMUM SIZE OF AGGREGATES:

For sizes of aggregates IS 383-1970 shall apply. 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. Smaller coarse aggregates than specified shall be used where in the opinion of the Engineer-in-charge that proper placement of concrete is impracticable with the size of the aggregate specified in the drawings.

C. 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 calibrate tanks or weighed. Batching plant shall conform 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 15 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 as determined and ordered by the Engineer-in-charge. Admixture of Pozzolanas, if ordered, shall conform to the requirements specified in IS 9103-1979 (Indian Standard Specification for Admixtures for concrete).

D. 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 brat ions.	Medium	25mm to 75mm slump for 20 aggregate.

II. For plain concrete work, slump requirements mentioned in item 1 above are applicable.

III. Lining with slip form machine 60 to 70 mm slump for concrete paver finish.

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 t of water and sand batched for concrete shall be adjusted 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 but 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 CONCRETE QUALITY ASSURANCE TEST PROGRAMME.

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 confirm to IS 516-1959.

SAMPLING PROCEDURE AND FREQUENCY:

A. 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.

B. FREQUENCY:

The minimum 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
51 to above.	4 plus one additional sample for every 50 cum. or part thereof.

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

TEST FACILITIES:

The contractor shall furnish free of cost samples of all ingredients of concrete for testing. He should also supply 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.

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**A. GENERAL**

Cement shall conform to clause 4 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. Ordinary or low heat Portland cement conforming to IS 269-1976
- b. Rapid hardening Portland cement conforming to IS 8041-1978
- c. Portland slag cement conforming to IS 455-1976
- d. Portland puzzolana cement conforming to IS 1489-1976
- e. High strength ordinary Portland cement conforming to IS 8112-1976
- f. Hydrophobic cement conforming to IS 8043-1978

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 precast 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 store 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 month. Each other 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 4082-1977 (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.

B. ACCEPTANCE OF CEMENT.

Portland cement shall be supplied by the contractor according to clause 10.1 of IS 269-1976 of the following brand.

C. ACCEPTANCE OF POZZOLANA:

Pozzolana added to the concrete as an admixture shall be sampled and tested as per IS 9103-1979

D. 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 as a result of over excavation intentionally performed by the contractor's shall be borne by the contractor himself. No extra payment shall be made to the contractors for such additional quantity.

4.2.4 ADMIXTURES:

The contractor shall use Air entraining admixtures as directed by the Engineer. 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 objectionably quantities of silt, organic matter, injurious amounts of oils, acids, salts and other impurities etc. as per IS specification No.456-2000.

The Engineer-in-charge will determine whether or not 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.

PERMISSIBLE LIMITS FOR SOLIDS IN WATER.

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

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 AGGREGATES):

A. GENERAL

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

All sand shall be furnished by the contractor from any approved sources specified in the contract. 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 (IS 456-2000)

B. QUALITY:

The sand shall consist of 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.

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 to be used SODIUM SULPHATE TEST 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 form natural source for concrete) when tested in accordance with IS 2386-1963 .

C. GRADING.

The sand as batched shall be well graded and when tested by means of standard sieves shall confirm 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. But sand confirming to the requirements of grading zone IV shall not be used for reinforced cement concrete work.

4.2.7. COARSE AGGREGATES:

A. 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 furnished by the Contractor from the approved quarries specified in the contract documents. 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.

B. 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 will be rejected if it fails to meet any of the following requirements.

1. LOS ANGES ABRASION TEST.

The abrasion value of aggregates when tested in accordance with the method specified in IS 2386 (Part IV) using Los Angeles 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.

2. 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 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.

3. SOUNDNESS TEST.

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

4. SPECIFIC GRAVITY:

The coarse aggregates shall have specific gravity of 2.60 minimum.

5. DELETERIOUS 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

C. SEPARATION.

The coarse aggregates shall be separated into nominal sizes during production of the aggregate. Just prior to batching, the coarse aggregates shall be rewashed by pressure spray and finish screened on multi-deck vibrating screen capable of simultaneously removing undersized and over sized aggregate from each of the nominal aggregate 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 will not be overloaded and will 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:

A. GENERAL.

Sand and coarse aggregate for concrete and sand for mortar and grout shall be obtained by the contractor from the approved sources shown in the contract documents. The approval of deposits by the Engineer-in-charge shall not be constructed as consisting 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 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.

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

B. DEVELOPING AGGREGATE DEPOSITS:

If the deposits 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 like trees, roots, bushes, sods, solid unsuitable sand and gravel and other objectionable matter. Materials including stripping, removed from deposits owned by the Government and 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 contractor who are also using any given source.

C. 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.

D. 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 .

4.2.9. BATCHING.

The contractor shall notify the Engineer-in-charge 24 hours before batching 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 weighted / 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 I.S. 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 4 of I.S. 456-2000.

Cement and aggregates are hauled from a central batching plant to the mixture 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 expressed to moisture and delays occur between batching and mixing extra cement shall be added to each batch. The extent of such extra cement will be so as to attain the required quality. No separate payment for this addition of extra cement shall be made.

4.2.10. MIXING.

A. GENERAL.

The concrete ingredients shall be thoroughly mixed in mechanical mixers designed to positively insure uniform distribution of all the component materials through out 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 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. If there is aggregation after unloading the concrete should be remixed.

After 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.

B. 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. Each mixer shall be controlled with a timing device which will indicate the mixing period and assure compliance of the required period of mixing.
4. The batch plant shall be equipped with an interlocking mechanism which will prevent concrete batches from entering mixers which are not empty.

4. TRUCK MIXERS:

Each truck mixer shall be equipped with accurate water meter located between the supply tank and mixers and having 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 from each batch. Each mixer shall have affixed there to a metal plate on which the drum are plainly marked.

Mixing shall be continued for the minimum period specified and may be increased and no of revolutions speed of the drum may be such that the mixer as delivered from the mixer has uniform in 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 15° C to 30° 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:

a. 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 line form positions and immediately correct 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 beveled edges on permanently exposed concrete surfaces. Interior angle of intersecting concrete surfaces and edges of construction joints shall not be beveled except where indicated on the drawings.

Suitable struts or stiffeners or ties shall be used for the form work 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 form work 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.

- b.** The form work 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 form work and supports shall be submitted to the Engineer-in-charge and got approved before erection.
- c.** In case of columns, retaining walls or deep vertical component the height of the column shall facilitate 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 form work shall be left exposed on the face of the finished work.
- d.** Suitable inserts for block outs for electrical and other service fixtures where necessary shall be provided in the required locations as specified.

- e. Cleaning and oiling of forms:- 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.

- f. **Removal of forms**

The stripping of form work shall conform to clause 10.3 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 upper sloping faces of concrete such as forms on the water sides of wrapped transitions shall be removed as soon as the concrete has attained sufficient stiffness 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.

- g. **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 item of form work provided in the bill of quantities.

4.2.13 TOLERANCES FOR CONCRETE CONSTRUCTION.

A. 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 (b) 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 are 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 with in the limit necessary to insure 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 b and c.

B. 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 specified in the table 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.

TABLE

	Variation from specified lines, grades and dimensions
B.	TOLERANCE FOR CANAL STRUCTURES.
1.	Deviations from specified dimensions of cross section of columns, beams, piers and slabs [(-6 mm to (+) 12mm] Deviations from dimensions of footing.
a.	Dimensions in plan = (-) 12mm to (+) 50 mm
b.	Eccentricity = ($\pm$) 0.02 times width of footing in the direction of deviation but not more than 50mm
c.	Thickness ($\pm$) 0.05 times the specified thickness.]

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

C. CONCRETE SURFACE IRREGULARITIES.

a. 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.

b. ABRUPT SURFACE IRREGULARITIES:

Abrupt surface irregularities are defined herein as offsets such as those caused by misplaced or loose forms, loose knots in form 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.

c. 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.

d. REPAIR OF 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 6.2.21 and shall be accomplished in a manner approved by the Engineer-in-charge. Concrete repair to bring concrete with the tolerance 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 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 can not be satisfactorily dealt with in this manner due to bad work or for other reasons, a coat of cement plaster of 1:2 of thickness as ordered by engineer shall be applied. No extra payment will be given for finishing concrete surface as instructed above in this clause.

e. 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 prevention actions such as modification to form, 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:

The contractor shall make his own arrangement for procurement of steel of required specification of reputed factory such as TISCO, IDC, Hirakud, H.S.L. etc for the work. Transportation from the place of supply to work site and all incidental charges will be borne by the contractor.

Reinforcing bars shall be placed in the concrete as shown in the drawings or as directed. For concrete canal lining the reinforcement rods as provided for in the drawing shall be placed.

For anchoring the concrete canal lining to the hard rock provision of anchor rod is made in the drawing and contractor shall place these anchor rods to the spacing and depth shown in the drawings.

B. 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 concrete reinforcement.

C. PLACING:

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 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, splice bars at additional locations other than those shown on the drawings. In order to meet design and space limitation on placing 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 center line of the bars. Reinforcement will be inspected for compliance with requirement as to size, shape, length, splicing.

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 bar lap or equivalent treatment is considered objectionable.

As specified in clause 11.3 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 11.4 of IS 456-2000. Concrete cover shall be as shown on the drawings.

D. REINFORCEMENT DRAWINGS:

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

E. 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 securing and maintaining in position 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 CURING:

A. 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 precast 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 expire 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 and 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.

B. 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 Engineer-in-charge.

C. COST:

The cost of furnishing 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.

4.2.16. 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 measurement will be cubic meter. In measuring concrete for payment the volume of all opening, fixtures embedded pipes and metal work each of which is larger than 0.1 square meter in cross section will be deducted.

4.2.17. PAYMENT FOR CONCRETE:

Payment for concrete shall be made at the applicable unit price in therefore 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.

SUPPLY OF PIPES:

Providing and fixing R.C.C. NP2/NP3 class pipes as per drawings.

Pipes shall be of specified diameter non pressure type conforming to IS 458-1971 Maximum length of the pipe shall not be less than 2.5 m. or otherwise directed by the Engineer-in-charge. The contractor shall order the pipes required for the work on the basis of the construction drawings supplied to him by the Engineer-in-charge. Pipe marked with the following information on each type shall only be accepted for the work.

- A.** Class of Pipe
- B.** Date of Manufacture
- C.** Name of Manufactures or his trade mark or both.
- D.** IS Specification mark.

HANDLING AND LAYING OF PIPES.

Work shall be done as per IS 783-1956 or its latest edition. Reasonable care shall be exercised in loading, transporting and unloading of concrete pipes. Handling shall be such as to avoid impact. All pipes shall be inspected thoroughly before being laid. Broken or defective pipes shall not be used. Trench shall be of sufficient width to provide for free working space in minimum 30 cm on either side of the pipe. Pipes shall be lowered into the trenches by use of standards appliance. Pipe shall be laid true to line and as specified on the construction drawings. Lying of pipes shall be along proposed grade of the slopes. The socket ends of pipe shall face upstream. The connections of the pipes shall be joined together in such a manner that these shall produce perfect even surface along the inside of the pipe. In no case pipes shall be laid directly on rock or other hard material.

JOINING PIPES:

Semi flexible type spigot and joint as per IS 783-1959 and as shown in the construction drawing shall be provided.

BACK FILLING TRENCHES:

- A.** Trenches shall be kept free from water until the materials in the joints has hardened. Walking or working on the completed pipe shall not be permitted until the trench has been back filled to a height of at least 45 cm. over the pipe except as may necessary for back filling and compaction.
- B.** Trenches shall be back filled after pipe has been laid subject to the condition that jointing has hardened only selected materials shall be used for backfilling. Filling of the trench shall be carried out simultaneously on both sides of pipe in such manner that unequal pressure does not occur.

MEASUREMENT AND PAYMENT:

Measurement for payment shall be on running meter basis on the pipe line laid. The rate in bill of quantities shall include the cost of pipes including loading, unloading, handling, storing, laying in position, taxes, curing & all other operations to complete the work as per the specification.

DRAWINGS

**(THE DRAWINGS ARE AVAILABLE WITH DIVISION OFFICE
DURING OFFICE HOUR OF PERIOD OF BIDDING)**

CHAPTER - VI

FORM OF AFFIDAVIT

AFFIDAVIT

I, Sri..... Agedyears
Son/ Daughter/ Wife of Sri..... at present
residing At..... P.O..... P.S.....
Dist..... Pin..... do here by solemnly affirm as follows.

i) That, I / We posses a valid license for execution of works contract issued by
*
belongs to..... Class & is valid up to * *

ii) I am submitting tenders before the Superintending Engineer, Drainage Division
Kendrapara for execution of following works in response to Invitation of tender call notice No
DDKPD- 02 of 2026-27 (Sl. No 2).

1..... * * *

2.....

Etc.

iii) I am the authorized signatory on behalf of contractor for the tender for the work / works
mentioned above.

iv) I am swearing this affidavit that all tender documents and accompanying papers those
being submitted by me before the Superintending Engineer, Drainage Division Kendrapara
including E.M.D. in any shape are all authentic and bonafied documents in the eyes of the law of
the land.

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

Signature of Contractor /
Authorized Signatory

Note:

*Mention the license issuing authority.

* *Mention the date up to which the license is valid

* * *Mention name of works for which tender is being submitted.

**ANNEXURE-‘F’
AFFIDAVIT**

I, Sri..... Agedyears

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 GST 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 myself in the GST Act in the State of Odisha ,and I will produce the GST registration certificate before drawl of the 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 outside contractor who has not started any business in the state of Odisha.

BILL OF QUANTITY

Tender Inviting Authority : **SUPERINTENDING ENGINEER, DRAINAGE DIVISION, KENDRAPARA**

Name of Work : **Decongestion and Desilting of drains under Aali Constituency**

Tender Call Notice No. : **DDKPD – 02 of 2026-27 (Sl. No. 2)**

Name of the Bidder :

BILL OF QUANTITY

Sl. No.	Description of Item	Unit	Qty.	Rate in `	Amount in `
1	2	3	4	5	6
1	Clearance of weeds, Ipomia and water hyacinth (thickly grown) from the drainage channel and dumping the clearance material away from the drainage area within initial lead of 50mtr and initial lift of 1.50mtr as per direction of Engineer in Charge	Sqm	2090428.33	2.80	5853199.33
2	Earth work in excavation of drain both in dry and wet conditions by mechanical means in all kind of soil including stoney earth, gravel moorum mixed with all leads, lifts and delifts, dewatering including trimming of slopes and bed to design section and depositing the excavated materials to the spoil banks or any other approved place including leveling and rough dressing for formation of embankment as per the specification and design with cost of hire charges of all machineries T & P ,operations maintenance cost with all leads, lifts and delifts etc complete including taxes, labour cess T& P etc . complete with all cost incidental to the work as per the drawing specification and direction of the Engineer-in-charge. (Measurement to be taken on initial and final level of sections)	Cum	8300.00	35.60	295480.00
	Total 01 (One) Item only			Total	6148679.33
				Or Say	6148679.00

(Rupees Sixty One Lakh Forty Eight Thousand Six Hundred Seventy Nine only)

**Superintending Engineer
Drainage Division, Kendrapara**

GOVERNMENT OF ODISHA
WORKS DEPARTMENT

OFFICE MEMORANDUM

File No. -07556900242019- 15847 NW, dt. 19-11-19

Sub:- Codal / contractual provisions regarding Price Adjustment in works contract.

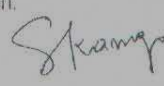
Codal / contractual provisions regarding Price Adjustment in works contract was under active consideration of Government. After careful consideration, Government have been pleased to make the codal/ contractual provisions regarding Price Adjustment clause due to increase or decrease in rate and price of labour, materials, fuels & lubricants and plant & machineries spare component to be incorporated in DTCN / condition of Contract as per Annexure-"A".

- 1- This Office Memorandum shall be a part of the relevant clauses of DTCN and Agreement and shall take effect from the date of issue.
- 2- This has been concurred in by Finance Department vide their File No. FIN-WF1-MISC-0031-2019 (OSWAS) dt.23.10.2019 and Law Department vide their UOR No.2218/L dt.29.10.2019.


Commissioner - cum- Secretary to Government

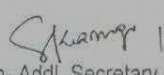
Memo No. 15848 NW, dated, 19-11-19

Copy with copy of enclosure forwarded to Principal Secretary to Hon'ble Chief Minister, Odisha for information and necessary action.

 18.11.19.
FA - cum- Addl. Secretary to Government

Memo No. 15849 NW, dated, 19-11-19

Copy with copy of enclosure forwarded to P. S. to Hon'ble Minister, Works, Odisha / P. S. to Hon'ble Minister, Finance, Odisha for information and necessary action.

 18.11.19
FA - cum- Addl. Secretary to Government

(P.T.O)

-2-

Memo No. 15850

W, dated, 19-11-19

Copy with copy of enclosure forwarded to OSD to Chief Secretary, Odisha / Sr. P.S. to Development Commissioner-cum-Additional Chief Secretary, Odisha / Sr. P.S. to Principal Secretary, Finance Department for information and necessary action.

S. K. Singh 18.11.19
FA - cum- Addl. Secretary to Government

Memo No. 15851

W, dated, 19-11-19

Copy with copy of enclosure forwarded to the Principal Accountant General (A&E), Odisha, Bhubaneswar / Principal Accountant General (E & S R Audit), Odisha, Puri Branch, Puri for information and necessary action.

S. K. Singh 18.11.19.
FA - cum- Addl. Secretary to Government

Memo No. 15852

W, dated, 19-11-19

Copy with copy of enclosure forwarded to All Departments / Managing Director, OB & CC Ltd., Bhubaneswar / Managing Director, OCC Ltd., Bhubaneswar / Chief Architect, Odisha, Bhubaneswar for information and necessary action.

S. K. Singh 18.11.19
FA - cum- Addl. Secretary to Government

Memo No. 15853

W, dated, 19-11-19

Copy with copy of enclosure forwarded to EIC (Civil), Odisha / All Chief Engineers, Odisha / All Superintending Engineers / All Executive Engineers (under Works Department) for information and wide circulation among subordinate offices.

S. K. Singh 18.11.19
FA - cum- Addl. Secretary to Government

Memo No. 15854

W, dated, 19-11-19

Copy with copy of enclosure forwarded to OSWAS Control Room with a request to upload it in the web-site of Works Department.

S. K. Singh 18.11.19.
FA - cum- Addl. Secretary to Government

(P.T.O)

-3-

Memo No. 15855

W, dated, 19-11-19

Copy with copy of enclosure forwarded to the Director, Printing, Stationary & Publication, Odisha, Cuttack by e-mail (deputydirectorpp@redifmail.com) for publication of this Office Memorandum in the next issue of Odisha Gazette and supply 20 (Twenty) copies to this Department for official use.

S. K. Singh
19.11.19

FA - cum- Addl. Secretary to Government

Memo No. 15856

W, dated, 19-11-19

Copy with copy of enclosure forwarded to A/C-I Section / A/C-II Section / Road Section / Plan Section / Building Section / Budget Section / N.Hs. Section / FC & AA Section / EAP Cell / Legal Cell, Works Department for information and necessary action.

S. K. Singh
19.11.19

FA - cum- Addl. Secretary to Government

Clause 31 :- Price Adjustment

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

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

(b) The price adjustment shall be determined during each month from the formula given in following Paras

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

R= Total value of work done during the month. It would include the amount of secured advance granted, if any, during the month, less the amount of secured advance recovered, if any during the month. It will exclude value for works executed for extra items under variations.

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

The formula (e) for adjustment of prices are:

31(a) (i): Adjustment of Other Materials Component

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

$$V_M = 0.85 \times P_m / 100 \times R \times (M_1 - M_0) / M_0$$

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

M_0 = The all India wholesale price index (all commodities) on 28 days preceding the date of opening of Bids, as published by the Ministry of Commerce and Industry ,Government of India, New Delhi.

M_1 = The all India wholesale price index (all commodities) for the month under consideration as published by the Ministry of Commerce and Industry , Government of India, New Delhi.

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


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31(a)(ii): Adjustment for Cement Component

Price adjustment for increase or decrease in the cost of cement procured by the contractor shall be paid in accordance with the following formula:

$$V_c = 0.85 \times P_c / 100 \times R \times (C_1 - C_0) / C_0$$

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

C_0 = The all India wholesale price index for Ordinary Portland Cement (OPC) on 28 days preceding the date of opening of Bids as published by the Ministry of Commerce and Industry, Government of India, New Delhi.

C_1 = The all India wholesale price index for Ordinary Portland Cement (OPC) for the month under consideration as published by the Ministry of Commerce and Industry, Government of India, New Delhi.

P_c = Percentage of Cement Component of the work

31(a)(iii): Adjustment for Steel Component

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

$$V_s = 0.85 \times P_s / 100 \times R \times (S_1 - S_0) / S_0$$

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

S_0 = The all India wholesale price index for steel (Mild Steel long products) on 28 days preceding the date of opening of Bids as published by the Ministry of Commerce and Industry, Government of India, New Delhi.

S_1 = The all India wholesale price index for steel (Mild Steel long products) for the month under consideration as published by the Ministry of Commerce and Industry, Government of India, New Delhi.

P_s = Percentage of steel component of the work

Note: For the application of this clause, index of (Mild Steel long products) has been chosen to represent steel group.

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31(a)(iv): Adjustment of Bitumen Component

Price adjustment for increase or decrease in the cost of bitumen shall be paid in accordance with the following formula:

$$V_b = 0.85 \times P_b / 100 \times R \times (B_1 - B_0) / B_0$$

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

B_0 = The official retail price of bulk bitumen at the IOC / BPCL depot at nearest center on the day 28 days prior to date of opening of Bids.

B_1 = The official retail price of bulk bitumen at IOC / BPCL depot at nearest center for the 15th day of the month under consideration.

P_b = Percentage of bitumen component of the work

31(a)(v): Adjustment towards differential cost of Pipes.

Price adjustment for increase or decrease in the cost of pipe shall be paid in accordance with the following formula:

$$V_{pi} = 0.85 \times P_{pi} / 100 \times R \times (P_{i1} - P_{i0}) / P_{i0}$$

V_{pi} = Differential cost of pipe i.e. amount of increase or decrease in rupees to be paid or recovered during the month under consideration.

P_{pi} = Percentage of pipe component of the work

P_{i1} = All India Whole sale price index of pipe for the period under consideration as published by the Ministry of Commerce and Industry, Government of India, New Delhi.

P_{i0} = All India Whole sale price index of pipe on 28 days preceding the date of opening of Bids as published by the Ministry of Commerce and Industry, Government of India, New Delhi.


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31(b): Adjustment of Labour Component

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

$$V_L = 0.85 \times P/100 \times R \times (L_1 - L_0)/L_0$$

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

L_0 = The minimum wages for unskilled labour as Notified by Government of Odisha as prevailed on the last stipulated date of receipt of tender including extension, if any.

L_1 = The minimum wages for unskilled labour as Notified by Government of Odisha as prevailed on the last date of the Month previous to the one under consideration.

P = Percentage of labour component of the work.

31(c): Adjustment of POL(fuel and lubricant) Component

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

$$V_f = 0.85 \times P_f/100 \times R \times (F_1 - F_0)/F_0$$

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

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

F_1 = The official retail price of HSD at the existing consumer pumps of IOC / BPCL/ HPCL at nearest center for the 15th day of the month under consideration.

P_f = Percentage of fuel and lubricants component of the work

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

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31(d): Adjustment for Plant and Machinery Spares Component

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

$$V_p = 0.85 \times P_p / 100 \times R \times (P_1 - P_0) / P_0$$

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

P_0 - The all India wholesale price index for manufacture of machinery for mining, quarrying and construction on 28 days preceding the date of opening of Bids as published by the Ministry of Commerce and Industry, Government of India, New Delhi

P_1 - The all India wholesale price index for manufacture of machinery for mining, quarrying and construction for the month under consideration as published by the Ministry of Commerce and Industry, Government of India, New Delhi.

P_p - Percentage of plant and machinery spares component of the work

Note : For the application of this clause, index of manufacturing of machinery for mining, quarrying and construction has been chosen to represent the Plant and machinery Spares group.

Regarding wholesale price Index (WPI) for appropriate commodity for payment of price adjustment, due to change of base year of WPI from 1993-94 to 2004-05 & 2011-12, it is observed that, the commodity 'Bars and Rod', 'Cement', 'Heavy machinery and parts' included in the list of WPI 1993-94 series are not mentioned as such in the WPI 2004-05 & 2011-12 series. Therefore, the following items in the WPI 2004-05 & 2011-12 series shall be considered corresponding to items in WPI 1993-94 series:

Sl. No.	Item in WPI 1993-94 series	Item in WPI 2004-05 series	Item in WPI 2011-12 series
1.	Cement	Grey Cement	Ordinary Port land cement
2.	Bars & rods	Rebars	Mild steel long products
3.	Heavy Machinery & parts	Construction Machinery	Manufacture of machinery for mining, quarrying & construction.

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31(e): APPLICATION OF ESCALATION CLAUSE:

The contractor shall for the purpose of availing reimbursement/refund of differential cost of steel, bitumen, cement, pipe, POL and wages, keep such books of account and other documents as are necessary to show that the amount of increase claimed or reduction available and shall allow inspection of the same by a duly authorized representative of Government and further, shall at the request of the Engineer-in-Charge, furnish documents to be verified in such a manner as the Engineer-in-Charge may require any document and information kept. The contractor shall within a reasonable time of 15 days of his becoming aware of any alteration in the price of such material, wages of labour and /or price of P.O.L. give notice thereof to the Engineer-in-Charge stating that the same is given pursuant to this condition along with information relating to there to which he may be in a position to supply.

Percentage Table

Sl No.	Category of works		% Component (cost wise)		
			Labour (P _L)	POL (P _I)	Steel (P _S) + Cement (P _C) + Bitumen (P _B) + Pipes (P _P) + Plant & Machinery Spare & Component (P _P) + 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 break up may be worked out considering the consumption of Cement, Steel, Bitumen, pipe and Plant & Machinery Spare Component in the concerned works and shall be provided in the bid document in shape of "Schedule of Adjustment Data" as an "Appendix to Bid". (enclosed herewith).

S. K. Singh
14.11.19

**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 Contract Sl. No	Index descripti on	Source of index	Base value*	Base Date*	Weighta ge of Item**
31 (a)(i)	Other Materials	All India Whole sale price index (all commodities) as published by the Economic Advisor to the Govt. of India, Ministry of Commerce and Industry.			
31 (a)(ii)	Cement	Whole sale price index for Cement (Ordinary Portland Cement) as published by the office the Economic Advisor to the Govt. of India, Ministry of Commerce and Industry.			
31 (a)(iii)	Steel	Whole sale price index for Steel (Mild Steel-Long Products) as published by the office of the Economic Advisor to the Govt. of India, Ministry of Commerce and Industry.			
31 (a)(iv)	Bitumen (VG-30)	Official retail price of bulk bitumen at the nearest IOC/ HPCL depot			
31 (a)(v)	Pipes	Whole sale price index for the type of Pipe under consideration, as published by the office the Economic Advisor to the Govt. of India, Ministry of Commerce and Industry.			
31 (b)	Labour	Minimum Wage notified by the Labour and Employee's State Insurance Department of Government of Odisha, India			5%
31 (c)	POL	Official retail price of HSD at nearest IOCL/ HPCL/ BPCL Consumer pump depot.			5%
31 (d)	Plant and Machinery	Whole sale price index for Manufacture of Machinery for Mining, Quarrying and Construction as published by the office the Economic Advisor to the Govt. of India, Ministry of Commerce and Industry.			
Total					100%

* Values to be filled up at the time of drawl of contract

**Values to be filled up in the bid document.

S. K. Singh
18/11/19